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Water, Human Rights and Governance

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FOREWORD

Nepal Water Conservation Foundation (NWCF) and The Institute for Social and Environmental Transition (ISET) hosted an international meeting on Water, Human Rights and Governance in Kathmandu from February 26th to March 2nd, 2001.

This special issue of *Water Nepal* is the proceeding of the meeting. There were altogether 68 participants from different parts of the world. In all, 36 papers were presented, of which 27 papers are included in this volume. Many of the papers have been revised by the authors and edited after the meeting. As editors, we have retained opinions of experts even though we may not necessarily subscribe to some of the views. The papers are arranged in five broad themes, which are: The Starting Point, Human Rights to Water-Thirst and Sanitation, Diverse Perspectives, Justice Denied and Governance Examples.

We would like to thank the Rockefeller Foundation, the Ford Foundation and Water Aid UK for providing financial support to the conference. This special issue is a combined effort of the two organisations, NWCF and ISET. We would also like to thank Perry Thapa, Ngamindra Dahal, Kanchan Mani Dixit, Rakshya R. Thapa and Pratibha Sarojini Manaen for their efforts in going through every little bit of details in the process of revising the papers. Thanks to Narayan Adhakari and Gita Bhomi for the layout.

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EDITORIAL POLICY

Water Nepal is published two times a year by Nepal Water Conservation Foundation. *Water Nepal* is a publication for planners, engineers, scientists, policy makers, and administrators engaged in water development and management. Its aim is to function as a forum for sharing experiences in different aspects of water resource development. Each issue of *Water Nepal* includes summaries of new techniques, reflections on current approaches in water development, management, research findings, and case studies of innovative practices including field experience. As a matter of policy *Water Nepal* publishes articles not published elsewhere. But pieces that are of policy relevance for Nepal, that serve educational purposes, will be included.

Editorials, feature articles, and reports in *Water Nepal* will discuss water management problems, analysis of long term development needs and trends, dispute resolution, impact assessment and mitigation, overcoming weaknesses and ensuring institutional learning for sustainable water development; as well as balancing water development with social and environmental objectives at the micro, meso and macro levels by understanding the interdisciplinary relationship between water use and sustainability.

Each issue of *Water Nepal* may include

Editorial: Issue and Authors – an overview of the articles and authors in the issue.

Viewpoint – a column that offers views on contemporary water development issues and provides a connecting thread to the views presented in the articles of the particular volume.

Feature Articles – detailed presentations of theory and practices in water development. Members of Editorial Advisory Board and other peer reviewers review these.

Innovation from field – brief presentation of field experiences in water resource sector.

Reports on Gray Literature – reviews of past or contemporary public documents in Nepal and abroad.

Book Review – books selected by the editorial board and reviewed by experts in the appropriate field.

An Editorial Advisory Board of practitioners, scholars, and professionals involved in water development assists the editors in selecting materials included in *Water Nepal*.

Opinions expressed in the article rest with the author/s and do not reflect views of Nepal Water Conservation Foundation, advisors of the journal or its funders.

WATER NEPAL, VOL. 9/10, NO. 1/2, 2003, 1-9

WATER, HUMAN RIGHTS AND GOVERNANCE: ISSUES, DEBATES AND PERSPECTIVES

MARCUS MOENCH[1], AJAYA DIXIT[2] AND ELISABETH CASPARI[3]

INTRODUCTION

The overall goal of the meeting was to explore the interlinked issues of water, human rights and governance and to evaluate how such concerns could practically be addressed in global approaches to water management. The substantive objectives of the meeting were to:

1. Identify and articulate the basic human rights issues associated with water management;
2. Explore issues of governance and measures, and identify key points of leverage where human rights questions might become a mainstream feature in decision making management around water;
3. Develop a practical strategy for utilising these points of leverage to mainstream the issues;
4. Establish links between the diverse groups working on water, governance and human rights; and
5. Publish a document highlighting meeting results and disseminate it to key public and policy audiences.

In many regions, competition over water supplies is growing while resource availability is declining due to pollution, groundwater overdraft and possibly climate change. Intense competition has created a situation where populations are gradually losing access to a natural resource that was once, at least on some level, freely available to all. In the urban slums of the developing world, families often pay 20 per cent and, in some cases, 50 per cent of their income in order to purchase sufficient water for basic needs. In other areas, populations (particularly the poor) are forced to migrate when their homes are submerged behind dams or when groundwater overdraft depletes supplies available for irrigation and even drinking. These are all dimensions of competition and all raise basic human rights issues.

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Human rights and water issues are interlinked on multiple levels. The displacement of populations and destruction of cultures that commonly accompany major water projects are perhaps the best-known sets of interlinked issues. In many parts of the world, however, pervasive health, basic needs and poverty concerns arise when access to water is limited. As a result, some see access to minimum daily supplies of water as a fundamental human right. In some cases, access to water is limited by physical availability. In many other cases, however, it is a function of human institutions and their operation. As in many natural resource fields, the establishment of private rights to water is often advocated as essential for efficient allocation and management of available supplies. This may raise fundamental ethical questions regarding the allocation of resources that are, under the cultural and religious traditions of many populations, a common heritage. The issue is not just theoretical. When well-owners sell 'their' water to urban consumers and take agricultural lands out of production (as is happening in Yemen, India and the Western US), do the populations displaced from traditional agricultural activities have any 'right' to protest the reallocation of water or claim a share in the benefits from water sales? What 'rights' should society retain when, in response to practical management needs or the pragmatic recognition of power relations in society, water rights are allocated to specific users? Furthermore, if public or individual 'non-right holder' rights remain, how should they be protected and given voice?

The last question relates to governance. Rights are meaningless unless practical mechanisms exist to ensure they are recognised. Many of the groups most affected by water management decisions have little ability to make their voices heard in forums such as the courts, government departments and the deliberations of multilateral donor agencies. Practical mechanisms are needed to ensure, as far as possible, that the rights of all people, regardless of wealth or social status, have a voice. This is an issue of governance – the processes and structures through which decision-making, implementation and enforcement occurs in society. It is also an issue of measures. Are economic factors the key criteria or should factors such as cultural integrity, religious traditions and the often-intangible quality of life be given equal weight? If these latter factors are as important as economic ones, can they be systematically evaluated in a manner that allows the trade-offs inherent in any water management decision (including the decision to do nothing) to be transparently weighed? Measures are central to governance because they are the currency in which tradeoffs are negotiated. If tradeoffs are weighed in economic terms, then the economic strength and interests of communities will heavily influence their relative voice in decision-making processes.

THE MEETING

The meeting was organised to meet the above core objectives. A selection of key participants were invited to compile substantive documentation on the links between water, human

rights and governance from their region in advance of the meeting. This information was used in the meeting as the starting point for discussions. The discussions, and the outcomes, were meant to contribute to policy and strategies designed both to guide the longer-term process and to educate key audiences (governments, multi-lateral agencies, advocacy organisations and the public).

The meeting was structured to bring together communities of analysts, experts and activists that otherwise rarely meet and interact. This was essential because broad-based approaches are central to the identification of strategies capable of 'mainstreaming' human rights considerations in water decision-making. To be taken seriously, the approaches need to reflect current water and governance dialogues. In addition, participants were selected to ensure that currently dominant and polarised debates over human rights and large dams *did not* overwhelm or dominate the meeting or its products.

The last point in the above paragraph is important to recognise and emphasize. Human rights concerns associated with large dams are very well known in global policy debates. In many cases these concerns have pushed groups into highly polarised positions and generated deadlock. We believe equally serious (but often geographically diffused and politically less prominent) human rights concerns are associated with the wide array of water scarcity and pollution problems now emerging in many parts of the world. Documenting and highlighting these dispersed concerns is far less likely to generate the types of deadlock that characterise debates over specific large-scale infrastructure projects. Instead, it may draw global attention towards the human impacts of environmental degradation and could serve as a rallying point or catalyst for global efforts to address such problems. In addition, because the human rights concerns associated with water scarcity depend heavily on how available supplies are allocated, they are inherently related to governance and institutional issues. As a result, focusing on the human rights dimensions of water scarcity and pollution should serve as catalyst for serious work on governance and institutional reform. These reform issues – not technological questions – are, from our perspective, the key to resolving most of the environmental, human rights and sustainability concerns now so evident in many parts of the world. In sum, instead of adding new points of controversy to already deadlocked debates, this workshop aimed to serve as a forward-looking catalyst for effective action.

We were fortunate to have a diversity of participants with regard both to origin and the frames of reference they brought to the topic. Though the majority of participants came from South Asia, global and some specific regional perspectives were also well represented. Participants came from academic institutions, government and development support agencies, human rights and research organisations and advocacy groups. This special issue of *Water Nepal* contains most of the papers presented at that meeting. The paper by Julia Hausermann on Human Rights and Water presented at a conference

organised by WaterAid UK in 1998 is also included in this volume because of its relevance to the discussions on issues of water and human rights.

The fact that the special issue is only being published now, two years later, reflects our own debates over what would be productive to do and how to proceed in an arena marked by differing perspectives and world views. Publication as a book was proposed, potential publishers were strongly interested and we put in substantial work attempting to structure the conference results into a set of balanced sections that would flow in book format. The more we worked at it, however, the more we became convinced that additional substantive input was necessary if a book was to have any lasting impact. The papers touch on a diverse and rich range of themes, as did debates at the conference. Subsequent discussions with activists, practitioners and a wide variety of individuals highlighted other themes. Taken together, these themes point toward areas where significant work remains to be done to link global human rights perspectives on water and governance to the perspectives emerging from field realities and the social/political environment internationally. More importantly, however, by bringing out the papers in all their diversity, this special issue will – we believe – be an important step forward.

THEMES AND ISSUES

When ISET and NWCF initially proposed hosting the meeting, organisers were uncertain of what to expect beyond a spirited and lively debate. We've had enough experience with such meetings to know that international and regional participants often approach such issue areas from different vantage points and, while speaking in English, are often speaking completely different languages.

Indeed, two distinctly different starting points, each with their own language, if you will, became evident at this meeting. On one hand, some participants focused on the relevance of global notions of human rights (including a human right to water) and on the importance of international recognition of such rights could have for global advocacy around poverty and water issues. On the other hand, many participants were focused more on basic, tangible and practical questions of governance to achieve, or often retain, access to water in Developing World contexts. To many participants with leanings toward the latter starting point, the notion of pursuing formalised human rights to water was at best a distraction from governance questions and at worst an imperialist notion. We'll return to this theme later. A further point where people talked past each other was the mix of debates over water rights (which often apply to large volumes of water for irrigation) and a human right to water for drinking and sanitation, which, in most locations around the world, represents less than 10 per cent of total water use. When it came to questions of ethics and a moral obligation to confront issues of water access and availability there was much

more unanimity. Or, put another way: 'The explicit and implicit theme that ran throughout the discussions were the ethical underpinnings on which decisions are or ought to be made.'

Our own perspectives on the subject of the meeting, as evident in Marcus Moench's paper in this issue, had far from 'jelled'. Should access to basic minimum amounts of water be defined as a human right as some advocates, notably Peter Gleick, Julia Hausermann and the World Humanity Action Trust, have called for? Water is essential for life, but public perceptions of what human rights are have tended to define them in terms of torture, genocide and other extreme acts of commission. However essential access to water is, would associating access with the legal and perceptual frameworks developed to control extreme acts of commission diminish such a concept of human rights? Furthermore, there are basic practical issues. Most debates over human rights have focused on national and international legal mechanisms. While, as many papers presented at the conference discuss, water law is a vibrant subject, water laws in many countries are in a state of flux and the court systems through which they are administered are overburdened and often ineffective. From a day to day perspective, access to water in locations such as South Asia depends heavily on traditional institutions, power relations and governance processes at local levels with little reference to higher level legal frameworks. Even if a formal human right to water were accepted in principle by the international community, what practical difference would it make? Was such a position even needed?

At the opposite end of the spectrum from formal legal frameworks are beliefs, ethics or 'natural law', discussion of which is well represented in papers from the meeting. Many people *believe* on a fundamental level that water is a common heritage to which all people are equally entitled. As the Roman Emperor Justinan wrote: 'By the law of nature these things are common to mankind – the air, running water, the sea and consequently the shores of the sea' (Institutes of Justinian, 2.1.1.).[1] This belief is most directly expressed in the ethical codes that are the foundations for or are derived from religious perspectives. Such ethical/religious codes were a focal point for a number of papers and debates at the conference. Religious perspectives on water often, though far from always, emphasise access to water for basic human needs as a 'fundamental right.' As the papers by Naser Faruqui, David Brooks and Marcus Moench note, Islam and Judaism have access to water for basic human and animal needs as fundamental tenets. Sudhindra Sharma's detailed field-research based study of water in Hinduism, however, suggests that not all religions share the right of access to water as a fundamental tenet.

Debates at this conference seemed sharply divided over the implications of religion and basic 'beliefs' for any formal statement on a human right to water or for specific governance mechanisms to be formulated and agreed on. Faruqui's paper, for example, argues that, under Islam, a fundamental right to water for basic human needs is 'understood' but that this does not preclude pricing or privatisation after such needs have

been met. Other participants at the meeting, however, were far more skeptical regarding both his interpretation of Islam and the ethics of any governance approach based on private rights and economics. As Llamas points out in his paper: 'Some claim that fostering the notion of water as a commodity moves public perception away from the reality of water as a common good and from a sense of common duty and responsibility toward water.' This perspective was clearly evident in many of the discussions. Similarly, many individuals at the meeting expressed concerns that the notion of a human right to water could strengthen already existing problems with national governments trying to establish and enforce centralised regulatory controls and thereby displacing traditional or indigenous rights systems. This split was, of course, not resolved. It reflects fundamental ideological contradictions on the role of markets, formal rights and the private sector that are central in many global debates over all aspects of life. As Meinzen-Dick and Pradhan argue, the notion of rights is pluralistic. Rights are more complex than the simple 'human right' versus commodity distinction now prevalent in international debates. The split also reflects divisions regarding the importance of rights versus duties. As Bhattarai commented, local people often take responsibility before demanding rights.[2]

Beyond the above debates, discussions reflected substantial unease among participants regarding the role of religious positions and, on a certain level, whether or not such positions should even be referenced in policy dialogues concerning water. As several of the Pakistani participants emphasised in discussions, Islamic perspectives on water can't be separated from the far larger body of religious law and practices. Emphasising the positive role the *right to thirst* plays under Islam can be seen as equivalent to supporting the direct role of Islamic teachings in other aspects of life. This is the same with all other religions. It isn't possible to pick and chose among religious statements to support particular perspectives while rejecting others. Religions are packages. While the contents of such packages are highly contested, drawing on religious teachings in public debates over human rights, governance and water touches on fundamental questions regarding the role of religion versus secularism in local, national and global governance. Deep contested waters.

Perhaps the most intriguing tension running through the meeting was a divergence between formal statements of a human right to water and accepted practice based on common 'understanding' or the view that human rights to water are already embedded in other statements of human rights and should not be stated separately. Participants at the meeting had little disagreement regarding whether or not access to water was something basic; a fundamental need for life, something people were entitled to. They disagreed, however, regarding the appropriateness of any formal statement regarding a human right to water in international law. This disagreement seemed rooted in a wide variety of factors: from unease regarding the dilution of human rights concepts to equally fundamental concerns regarding the role of global institutions and western concepts of justice in the

context of South Asia and other less industrialised regions. In some instances, international attempts to establish human rights norms were seen as part of a continuing colonial and post-colonial effort to constrain developing countries while applying less than equally to the northern countries advocating such norms. It is not sufficient to assert claims to the resource; unless claims are accepted by a larger collectivity than the claimants they are not considered legitimate. In addition, the notion of access to water as a fundamental human right was contested from the perspective of ecological rights: why should the right of water for basic human needs dominate the right of water for maintenance of basic ecological systems? As the abstract prepared by Imtiaz Ahmed argues: 'the idea that only 'humans' have 'rights' can hardly be sustained any longer.'

Ahmed's analysis is similar to Llamas's extensive discussion of water ethics. This focuses not on access to water as a separable human right but more on the overall ethics of decision making and governance related to water. In his analysis, the human right to water is implicit in other rights. He makes the point, for example, that under the UN Universal Declaration of Human Rights of 1948 'the Principle of human dignity means that all persons are worthy of respect and the human person is an end and not a means. There is no life without water, and those to whom it is denied are denied life. The principles of water for all and meeting minimum basic needs are, thus, vitally tied to the principle of human dignity.' He then goes on, however, to focus on the day to day ethical decisions inherent in water governance and management. These are the basic mechanisms through which a human right to water, whether formally stated, embedded in other laws and conventions, or simply an 'understood' norm translate into action.

TOWARD A CLEARER VISION?

The concept of duties as opposed to rights was among many basic questions raised at the meeting that were not explored in detail at that time. Other questions included:

1. Can notions of human rights to water and environmental justice be addressed through governance, cultural, or economic systems without relying on legal mechanisms or formal statements of 'a human right to water'? At a global level, notions of human rights or environmental justice have focused heavily on law and international covenants. Regionally, however, legal approaches are often unproductive (the Supreme Court of Nepal, for example, had a backlog of some 18,000 cases in January 2003). Furthermore, at a local level, issues of access to water depends heavily on governance, power relations, cultural norms and the operation of economic systems in ways that make little reference to international covenants or legal frameworks. Would it be more productive to operationalise notions of environmental justice or basic human rights by focusing on

the operation of such systems rather than utilising the law or formal declarations? Should 'water' even be addressed separately from wider questions of governance? *Actualisation* is a key issue. If a right cannot be actualised then perhaps it is better to focus on pragmatic questions of governance that control access to water rather than less enforceable notions of rights.

2. *What makes access to water any different from access to food or the right to work?* Many issues that could be seen as affecting human rights in the case of water also apply equally to many other aspects of life. Would it be more productive to focus on widely held ethics and their application in the day to day process of water development and management (as Llamas's article implicitly suggests) than on a human right to water?
3. *Is a human rights or environmental justice lens on water problems likely to lead toward practical points of leverage for addressing such problems in the context of developing countries?* Most international discussions on human rights have focused on conventions such as the International Covenant on Civil and Political Rights (covers acts of commission such as torture) and the more recent International Covenant on Economic, Social and Cultural Rights (covers more generalised rights such as right to livelihood). As an article in *The Economist* points out, the first group of rights is widely recognised in law throughout the world; these rights defend 'freedoms that are recognised across nearly all the ideological spectrum', while the second group 'are widely violated in all corners of the world'.[3] As Alan Etherington from *Water Aid* pointed out at the conference, the 1989 Convention on Rights of the Child (ratified by all but two countries) was the first such convention to explicitly mention a right to water and sanitation. Has this mention played a significant role in catalysing practical efforts? If so, how? If not, is the approach worthwhile in a practical sense?
4. *How might a human right to water 'mesh' with already established rights systems?* As many of the papers presented at the meeting clearly document, a wide variety of water rights systems are already established in both tradition and law around the world. These 'rules in use' are pluralistic and govern access to water on a daily basis for most people. On a practical level, any approach based on notions of environmental justice and human rights would need to affect or modify such rules in use – a concept to which there was considerable resistance among meeting participants!
5. *How do acts of commission, acts of omission and differential vulnerability to systemic problems 'fit' within a human rights framework? Are acts of omission equivalent to acts of commission?* If one applies a human rights lens to water issues, distinctions may need to be made between the clear human rights issues inherent in acts of

commission (such as population displacement due to the construction of dams), the less clear rights issues in acts of omission (differential provision of piped water supply by governments), and differential vulnerability to systemic problems where no single actor has responsibility (as in the case of populations migrating due to groundwater depletion).

Questions such as the above were raised but not answered at the meeting. They represent, however, the core content that tie the diverse strands of the debate over human rights to water together. We believe they need to be investigated if high level debates over human rights to water are to be translated into pragmatic norms and governance approaches that influence how water is managed and allocated. Furthermore, these basic questions apply equally well to broader notions of environmental justice and social equity in this rapidly changing world. How they can be addressed in practical terms will affect the lives of many. This should be a major focus of work and research in the future.

NOTES

[1] National Audubon, 658 P. 2d at 718 (quoting J. Inst, 2.1.1)

[2] This perspective was perhaps best captured by Imtiaz Ahmed's quote selected from Mahatma Gandhi: 'Received your cable. Have carefully read your five articles. You will permit me to say your are on the wrong track. I feel sure that I can draw up a better Charter of Rights than your have drawn up. But of what good will it be? Who will become its guardian? If your mean propaganda or popular education you have begun at the wrong end. I suggest the right way. Begin with a Charter of Duties of Man (Both D and M Capitals) and I promise the Rights will follow as spring follows winter. I write from experience. As a young man I began life by seeking to assert my Rights and I soon discovered I had none not even over my life. So I began by discovering and performing my duty to my wife, my children, friends, companions, and society, and I find today that I have greater Rights, perhaps than any living man I know. If this is too tall a claim then I say I do not know anyone who possesses greater Rights than I.'

[3] *The Economist*, The politics of human rights, August 18, 2001, p. 9.

The Starting Point

WATER NEPAL, VOL. 9/10, NO. 1/2, 2003, 13-27

ETHICAL CONSIDERATIONS IN WATER MANAGEMENT SYSTEMS

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ABSTRACT

Water management decisions have many facets including planning, regulating, designing, construction, operation, maintenance and cost allocation. Decisions might be variously considered wrong or right according to the system of values espoused by a society. Many consider that universal ethical principles exist, such as those embodied in the United Nations Declaration of Human Rights of 1948. It is considered that practical ethical principles in water activities evolve from the concepts of human dignity and human sociability. Most water problems are caused by a lack of equilibrium between its utilitarian (economic) value which is connected to human sociability and its intangible or sacred values which are related to human dignity. The application of these principles may generate legitimate but different practical solutions because of the complexity of water uses (urban, irrigation, energy etc.) and the great variability of water needs and values, physical and social, geographical and historical. The solidarity principle should inform the relations between upstream and downstream water users and between countries in international watersheds. It also is the basis for the concept of sustainability, i.e. solidarity towards future generations. The subsidiary principle recommends that decisions should be made at the lowest social level compatible with the common good. Coordination among family groups, municipalities, countries, states and federal institutions is crucial but not easy to achieve. The participation of all stakeholders is deemed a must but in practice the application of this principle face may serious obstacles because many stakeholders are poorly educated and informed. The main obstacles to the implementation of ethical principles in water management are described under the following concepts: ignorance, arrogance, institutional inertia and corruption. Case histories from Spain, the most arid country in Europe, will be shown as examples of ethical-or unethical-solutions.

INTRODUCTION

Scientific and technological advances over the past several decades have resulted in great changes in the lives of individuals and societies. The 1990s and the first years of the 21st century have seen an increased interest in and awareness of the need for a better understanding of the ethical, religious, or philosophical principles which under pin the development and applications of science and technology. This interest is probably paramount in the field of biomedical sciences because of its almost immediate

effect on society. Also, in other areas, like energy or climatic change, more and more researchers are concerned with their ethical implications. The ethics of fresh water use, water hazards and management have also become the focus of research of an increasing number of people. It can be said that the study of water ethics has almost become a fashion, and during the last five years a good number of conferences and working groups have been devoted to this issue. For instance, during the 2nd World Water Forum (The Hague, 17-23 March, 2000), at least three sessions were directly related to water and ethics.

SCOPE AND AIM

This presentation will emphasise the ethical aspects related to water management. Other relevant issues, such as the uses of water and its hazards, will not be dealt with. They are summarised in other documents such as in Llamas and Delli Priscoli (2000) or in WHAT (2000). The first part of this presentation deals with the basic principles, characteristics and goals for a universal ethics of water management. The application of these principles to different aspects of water management, such as water institutions and financing, markets and prices, the limits of decision support tools, the role of women, international basins and aquifers, the dams dilemma, and conflict resolution, will be discussed. A large part of this presentation is an updated version of what is written on these topics in Llamas and Delli Priscoli (2000).

BASIC CONSIDERATIONS REGARDING WATER AND ETHICS

Debates surrounding water resource management mirror broader debates of social ethics. The social context for the ethical questions concerning water tend to revolve around notions of water as a common good; water and its connection to human dignity and basic needs for life; water as a facilitator of well being for people; rights and responsibilities toward water access; and the wealth-generating and development roles of hydraulic infrastructures and their ecological impact.

One way to look at the close connection between water and broader social ethical concerns is to look at how water management concerns relate to what many consider universal ethical principles, such as the Universal Declaration of Human Rights of 1948. For example, the principle of human dignity means that all persons are worthy of respect and that the human person is an end and not a means. There is no life without water, and those to whom it is denied are denied life. The principles of water for all and meeting minimum basic needs are vitally tied to the principle of human dignity. The ethical principle of sociability means that person is social as well as sacred. The principle of participation

means that individuals, especially the poor, must not be avoided from participating in those institutions necessary for human fulfillment.

The ethical principle of solidarity, or that we are all connected, teaches us that we are our brothers' keepers, and that loving our neighbour relates directly to our growing sense of interdependence. More than almost any other natural resource, water continually confronts humans with their upstream and downstream interdependency and calls humanity to more solidarity. Indeed, the current call for integrated water management could be seen as a direct subsidiary teaching of this principle. Solidarity is supported by the principle of human equality. This is commonly taken to mean rendering to each person his or her due.

These ethical principles are furthered buttressed by the principle of the common good. The common good is understood as the social conditions that enable people to reach their full human potential. By almost everyone's definition, water is a common good. Our arguments are mostly about how to manage this common good. This principle reminds us how ethically important the management of water really is. With poor water management human potential and dignity are diminished for all and perhaps denied to some.

The ethical principle of stewardship teaches respect for creation or nature as well as moral responsibility to that creation. However, it also calls for the wise use of nature and not for extreme reverence for it. Indeed, much of water management is about finding an ethical balance among using, changing and preserving our water and land resources. The consensus on sustainable development can be seen as an ethical norm derived directly from this principle. Sustainable development aims to achieve a balance between the utilitarian use of and respect for the intrinsic value of Earth's resources.

Christianity, Islam, Buddhism, Hinduism and most other religions mirror these principles. For example, Hindu tradition considers water a powerful medium of purification and a source of energy. In the Regvada, a water prayer is offered; 'The waters in the sky, the waters of rivers, and water in the well whose source is the ocean, may all these sacred waters protect me'. In Islamic tradition, the *Shariah*, which many feel is a better term to use than law, literally means the 'source of water.' The *Shariah* is the source of life because it contains both legal rules and ethical principles. It tells people water is: proof of God's existence, unity and power; proof of God's care; and proof of resurrection as water restores life every day. The Quran contains sixty references to water and over fifty references to rivers. There are also many references to the distribution of water. Its statements about life-preserving water for the individual and sharing small quantities of water with others, such as the obligation to give water to visitors, are well known. Although the Quran says less about what might be called the macro-economic uses of water, obligations at this level can be implied. For example, the Quran states that water should be divided

among people and that water resources should not be monopolised by the powerful against the poor. Faruqui *et al*. (2000) have recently presented a detailed analysis of ethical principles for water management in Islamic countries. Llamas (2001) has published an analysis on the main ethical problems on water policy in Spain, a country with a Judeo-Christian tradition.

Water is one of the enduring human symbols for life, regeneration, purity and hope. It is one of our most powerful links with the sacred, with Nature, and with our cultural inheritance. It offers a medium for a global project that unifies humanity in a single cause for peace, stability, amity, and ecological sustainability. The simple pleasure of drinking pure water and the awesome power of waterfalls have the potential to bring us together as one with each other and as one with Nature. Water offers a medium for creating a culture of peace and rarely becomes a real cause of wars, as the chairperson of the World Commission on Dams recently reminded us (Asmal, 2000).

Ethics and water management

The ethical implications of most aspects of water management-planning, regulating, operating, financing and investing, designing and implementing, are clear. These ethical considerations tend to revolve around the following questions:

- Who participates?
- What are the decisions they participate in?
- Do they have access to formulating options or only to reacting to options already formulated?
- How and what type of opportunity costs are considered?
- What is the implicit or explicit basis of valuing water in trade-off decisions? What level and type of information is open to the public?
- To what extend are environmental and social impacts included and how are they characterised?
- In what way do professionals interact with non-professionals and how technical and professional information used as well as misused?

Decision makers must understand the linkage between development strategies and the conflicting issues of water allocation, supply and pricing. Water must be seen in the context of macro-economic national and regional strategies. Decision makers must also understand that their decisions have hidden implication for people that do not possess full rights because of poverty. They have an ethical duty to understand such implication and to equitably mitigate the effects of their decisions.

Water institutions and financing

The current debate over private versus public roles in water management is often too narrowly focused and ignores important historical realities of the developed countries that advocate them. Today, privatisation is seen as a way to increase efficiency and to bring more water to more people, i.e. to democratise water and sanitation. However, privatisation also raises questions about the open flow of information and about transparency. Organisations that operate for a profit are frequently not as prone to share critical information on water flow or water quality as their public counterparts, particularly where there is a weak regulatory environment and/or a social atmosphere prone to corruption (OECD, 2000).

Privatisation of the vendable aspects of water can lead to older notions of single purpose planning and management of water and directly contradict the ethical principle of integrated water resource planning. Some water services such as flood control cannot be privatised. Others, such as navigation, can be privatised only to small degree. Thus, the push to privatise may encourage the fragmentation which integration seeks to overcome.

The debate over governance for water must move beyond choosing from the poles of privatisation and public bureaucracy to the myriad of possibilities between these poles. For example there is a difference between public good and common property under public trust. The evolution of water law and water institutions historically has been inspired far more by the latter by either private or public ownership. Indeed, the debate in Europe is moving from private versus public to one between public regulations on the one hand and common property-based forms of governance on the other. State intervention is needed to ensure equity among users and to introduce needs outside the municipality, such as those demanded by the river basin or watershed. International water law, the least developed of all water law, is also moving in this direction by increasingly referring to transboundary and international waters as common waters and thus subject to ethical and legal norms beyond those generated by the nation state.

Often privatisation occurs not for positive reasons, but because public procurement could not generate important investments or because elected officials do not want to appear responsible for water price increases. But other options do exist, they include managing utilities services together and pooling financing needs or temporally averaging interest rates to lower the cost of investments in water. Essentially, it is the cost of money that determines water investment. We must be careful in prescribing, for good reasons, policies based on experiences not shared by those for whom we are prescribing them.

MARKETS AND PRICING

Recognising water as an economic good, (a recognition now part of many declarations on water and of policies of major lenders and donors) has generated heated political debate, created much fear and revealed fundamentally differing values associated with water among various cultures. Some claim that fostering the notion that water is a commodity moves public perception away from the reality of water as a common good and from a sense of common duty and responsibility toward water. In other words, there are profound ethical implications in perceiving ourselves as water citizen rather than water consumers. Viewing water as a common good focuses us on the former role while emphasising private as well as public ownership rights focuses us on the second. Responsible water use depends as much on assuring fair shares of water as on pricing. We should also bear in mind that, in most cases, what is charged for is not water *per se* but the services, the instruments necessary to bring water from its natural source to the user.

Of course the reality is that water is used as a factor of production and managed as a commodity to some degree, by all societies. Whether explicitly or not, water is valued and it clearly incurs opportunity costs. However, all its costs and benefits are not and cannot be reduced to quantifiable currencies. Water is priced in some way by all societies. The poor often have no choice but to pay high prices. Buying water to vendors on the streets can result in the poor spending between 5-10 per cent of their income, and in some places as much as 20 per cent of their income, on water. In contrast, in most industrialised countries lower-middle class families only spend 0.5-3 per cent of their income on potable water and sanitation.

Clearly, if water is not priced correctly it will be wasted. However, the reverse is not always true. Proper management requires good data on use and, in most cases, this means metering. In fact, water demand is actually falling in many developed societies for a variety of reasons. However, when this happens unit prices are often raised so as to cover debts. But for the public to accept such a situation requires that authorities be legitimate and trusted and accepted by the public. It requires confidence that transaction costs are being kept as low as possible. Unfortunately the opposite can happen as the public sees both prices and profits and salaries in water companies going up simultaneously. Indeed, since privatisation in Britain many people have been less inclined to save water during droughts because they perceive conservation as working for the private gain of the water companies.

Market allocation requires secure user rights and low transaction costs. Effective government or legitimised governance is central in any use of markets. It provides for secure user rights, assures low transaction costs, assesses and assures mitigation of third party impacts, and provides the means for consensus building and for the resolution of conflicts not solved in the market.

All variations of public and privatisation policies which deal with water must incorporate significant ethical responsibilities for enhancing the capacities of public institutions. Just as we need better water pricing, we must also realise the role that subsidies have played and are realistically going to play in the future. In this light, open access to information, transparency in decision making processes, and broad user participation in decisions are the key ethical imperatives for water management in order to prevent subsidies from becoming 'perverse subsidies' which are bad for the economy and the environment (Lopez and Llamas, 2000; WHAT, 2000).

PROCEDURES, ANALYSIS AND DECISION SUPPORT TOOLS

In the coming years the number of people without access to water may grow, if 'business continues as usual' (Cosgrove and Rijsberman, 2000). How will they get it? In addition to conservation water development projects will be needed. If we start today, these projects can be planned in an ecologically sensitive way. But if we wait, because of the simplistic application of the precautionary principle, the pressure to quench the thirst of the poor may force the building of ecologically unsound projects.

We must produce data commensurate with emerging decision-making needs. As we increase efficiency and operate water systems (urban and irrigation) closer to their margins, risk based management will become more prominent. However, such management requires good hydrological, social, economic and other data-and such data is sparse. Today the quantity and quality of hydrological data is worse than it was two or three decades ago. The cost to develop an acceptable database is, however, often less than that of building a medium-sized dam (WHAT, 2000).

The relation between the flow of money and the flow of benefits and costs must become more transparent. To the best of our abilities, we must find out the consequences of our actions. This is a precondition to ethical action. Thus, impact assessments are crucial for both informed technical and good moral decisions. However, we must move beyond being paralysed by either our understanding of such consequences or the uncertainties surrounding them. This can lead to unethical delays. We must also assure that meaningful participation occurs in the early stages of formulating options rather than at later stages of discussing already formulated options. At this latter point much money would already have been spent and proponents are compelled to spend more time defending than creating options. Often this results in wasted capital, bitterness and no service for legitimate needs (World Commission on Dams, 2000).

Traditional cost benefit analysis and more recent risk assessment techniques have been a central part of procedures for deciding on water investment. Since these tools favour quantified data, they can, however, be inadvertently biased. We have an ethical

responsibility to discern such bias and to make analytical tools such as these more balanced. For example, cost benefit analysis for flood control has often included only direct benefits and costs, which are often property based. Thus, those without property become less valuable to protect, and expenditures of public money begin to favour the rich. Another shortcoming is that ecosystem health cannot be easily quantified, it is often relegated to a position of secondary importance. Of course, the opposite phenomenon when all ecosystem protection is considered equally important and cannot be prioritised, leads to biases and extremes in the opposite direction. New investment decision-making tools which take such bias into consideration and help us to compare non-monetary data must be developed and used.

SPECIAL ROLE OF WOMEN AND WATER

Women, who are increasingly becoming the poorest of the poor, carry a disproportionate burden of inequities. Women often do not have access to property, whether land or water rights. Not addressing inequity against women, especially those in Africa and parts of Asia, is a major cause of hunger. For example, because of poverty-induced malnutrition, a large percentage of children (over 50 per cent in Bangladesh) are growing up stunted and with impaired learning capacities. Gender biased poverty is at the root of the so-called water crisis. Promoting literacy, information, education and jobs for girls and women can go a long way in overcoming the scarcity of potable water.

De facto women are the key water managers in many small villages and communities. As such they are the key to the maintenance and operations of facilities and frequently have the greatest direct interest in and bear the greatest direct impact of water procedures. Studies repeatedly show that ensuring the participation of woman is both ethical and pragmatic. Those projects in which women participate are more likely to be sustained and to generate expected benefits than those in which they do not. The importance of women participation was formally recognised in the Dublin principles and is clearly implied in many other UN declarations. Thus, participation of women in water management decisions is an ethical imperative for social development.

TRANSBOUNDARY AND INTERNATIONAL DECISION MAKING

We must find ways to better coordinate upstream and downstream activities. Most of the world's population lives in areas that depend on rivers that cross national or other jurisdictional boundaries. After many years of discussion, the UN has finally adopted a convention on non-navigable waters that outlines important principles for transboundary water management, such as prior notification must be given before action, no appreciable harm should be incurred by projects, and no inequitable actions should be taken. These

are good principles for activities on all transboundary waters and for upstream and downstream entities. But in practical situations the principles can actually conflict with each other. Also, there is no international enforcement mechanism to assure their implementation. Thus, creating incentives for cooperation, coordination and joint planning and management of upstream and downstream activities is an ethical imperative. International lenders and donors must create such incentives for cooperation, coordination and joint actions without dictating site-specific solutions. River basins should be more a norm for social organisation in many parts of the World.

We have an ethical responsibility to ask how global actors, often more powerful than countries, can become accountable to such principles and regulations. This is especially true if we are advocating policies which call for greater intervention by those countries.

THE SPECIAL CASE OF DAM CONSTRUCTION

Dams were among the first targets of the recently growing environmental awareness. For many years structures and dams were the solutions employed for most water management needs. Indeed, dam construction and controlling nature became synonymous with civil engineering and water management. In short a means, dams and structures became ends in themselves. Dams were also symbols of the 19th century's triumph of machines and technology and they provided an important symbol beyond their impact and performance. Indeed, the mirror image of this ends, means confusion now appearing in some extreme ecological appeals in many current debates. In this instance, any proposal that includes taking out a dam becomes good; in other words, the means – decommissioning a dam – become the end.

There were 36,235 large dams (defined as higher than 15 metres) in the world in 1986. The average number of dams built from 1983 to 86 was 267 annually. The number under construction in the world was about 1,242 in 1994. Many dams provide clean and renewable energy, an enhanced ability to manage extreme fluctuations, a greater capacity to generate economic development though multiple uses of water and greater predictability and protection in the lives of many. However, the benefits are accompanied by socio-economic and environmental costs which are sometimes unacceptable. While many criticisms are valid, focusing on costs without considering social trade-offs and benefits is unethical. So too, is the all-too-familiar pattern in which constructors proceed without the meaningful participation of those impacted by the dam and sometimes even with intimidation. The negative impacts of development on traditional communities and the poor must be clearly defined and fairly dealt with. Arguments must move beyond either the presence or the absence of a dam. The discussions need to broaden to include the size of the dam, site selection, managerial procedure and efficiency, all of which issues have a more decisive social impact than whether a dam is built or not.

Despite the opposition to dams in developed countries, more dam construction may be needed and warranted in some places. The ethics of dam construction calls for minimising the adverse environmental and social effects of construction and for maximising the efficiency of existing reservoirs. Deciding on structures should follow ethical procedures such as 1) assuring that existing reservoirs are fully utilised; 2) examining alternatives exhaustively 3) selecting reservoir options using sustainability criteria; 4) determining reservoir size using the least marginal environmental impact rule; 5) following democratic decision-making processes and considering social care; 6) implementing mitigation measures; 7) post auditing the reservoir over the full life cycle of its existence; and 8) taking a systems approach and utilising current information technology. The final report of the World Commission on Dams (2000) has provided much information and a strong debate on this topic. Probably some time will be necessary to clarify the many issues dealt with in this final report.

THE NEW SITUATION IN GROUNDWATER DEVELOPMENT AND MANAGEMENT[1]

In most semi-arid and arid countries groundwater development has significantly increased during the past fifty years. This has been brought about by a large number of small (private or public) developers, often with poor scientific or technological control by the responsible water administration. In contrast, the surface water projects developed during the same period (dams, canals, etc.) are usually of larger scale and have been designed, financed and constructed by government agencies that normally manage or control the operation of irrigation or urban public water supply systems. Many groundwater managers have a limited understanding of and poor data on the groundwater situation and value, resulting in such problems as depletion of the water level in wells, decrease of well yield, degradation of water quality, land subsidence or collapse, interference with streams and/or surface water bodies, and adverse ecological impact on wetlands and/or gallery forests. Reports on these effects are often exaggerated, resulting in the myth that groundwater is an unreliable and fragile resource that should only be developed if it is not possible to implement conventional large surface water projects (López and Llamas, 2000).

The term 'over-exploitation' has often been used in relation to groundwater despite the fact that most experts agree that the concept is poorly defined and that misconceptions are pervasive (Custodio, 2000; Hernández-Mora *et al.*, 2001). The terms related to over-exploitation have in common the idea of avoiding undesirable effects as a result of groundwater development. However, this undesirability depends mainly on the social perceptions of the issue, which are sometimes more related to the legal, cultural and economic background of aquifer development than to hydro-geological facts. What

may be perceived in one area as a benefit (developing much-needed irrigation), may well cause conflict elsewhere (e.g., if it degrades wetlands, which may be viewed as an unacceptable environmental cost).

Some specialists believe that groundwater mining (or the development of fossil aquifers or of nonrenewable groundwater resources), is contrary to the concept of sustainable development and should be socially rejected, if not legally prohibited. Nevertheless, there are those who posit that, under certain circumstances, groundwater mining may be a reasonable option. It might be said that fossil groundwater has no intrinsic value if it is left in the ground except as a potential resource for future generations, but that raises the question of how to determine whether they will need it more than the present generation.

The crucial importance of preventing groundwater pollution in order to avoid a future water crisis has begun to be understood in only a handful of countries. The old proverb 'out of sight out of mind' is very apt in this case. A strong educational effort must be implemented in order not to bequeath to posterity aquifers that are almost irreversibly polluted. This is the real problem in most countries, be they humid, arid or semi-arid. The depletion of groundwater storage (classical over-exploitation) is not generally as serious a problem as the degradation of groundwater quality, and often may be solved without great difficulty if water-use efficiency is improved.

Real or imagined ecological impacts are becoming an important new constraint in groundwater development. These effects are mainly caused by water table depletion, which can culminate in the decreasing flow or drying up of springs, low flow in streams, the diminution of soil moisture so much that, the certain types of vegetation cannot survive and changes in microclimates because of the decrease in evapotranspiration. In some cases, the ecological result of such changes is obvious. For instance, if the water table that was previously at land surface is lowered by more than 10 metres during more than 20 years, it is clear that the peatland or gallery forest that might exist on that aquifer is not going to survive. But if the water table is depleted only during one or two years and not more than one or two metres, it cannot be assumed that the ecological impact will be irreversible. Unfortunately, quantitative and detailed studies of this type of problem are still rather scarce in most regions. Another proverb that comes to mind is 'Prevention is better than cure.' But here, too, the precautionary principle should be applied with considerable prudence.

In general, groundwater development should not be rejected or seriously constrained if it is well planned and controlled. During recent decades, groundwater withdrawal has generated undisputed socio-economic benefits. Particularly in developing countries, it is a major source of potable drinking water, in fact 50 per cent of municipal water supplies worldwide depend on it, as do many rural and dispersed populations. Watering crops with groundwater has made it possible to increase food production at a

greater rate than population growth; 70 per cent of all groundwater withdrawals are used for irrigation, particularly in arid or semi-arid regions. It should also be pointed out that using groundwater for irrigated agriculture is often more cost-effective than using surface water, primarily because farmers typically assume all abstraction costs (development, maintenance and operation). Groundwater abstraction usually produces significantly more income and jobs per cubic metre than surface water does (Hernández-Mora *et al.*, 2001).

Most countries consider that the level of groundwater abstraction should not exceed that of exploiting renewable resources. Others – mainly the most arid countries – find that groundwater mining is an acceptable policy as long as available data assures that it can be economically maintained for some time (for example, more than fifty years) and that ecological costs are compensated by socio-economic benefits. With careful management, many arid countries will be able to utilise resources beyond the foreseeable future without major restructuring. Clearly, it is not easy to achieve a virtuous middle way. There is a tendency to move from one extreme to the other despite potential risks associated with both extremes.

The complexity of the question and the variety of possible responses aside, depending on place and time, there are several overarching issues that have ethical implications for trying to achieve sustainable, reasonable groundwater use. Firstly, subsidies (some hidden and some open) that have traditionally a part of large hydraulic works projects for surface water irrigation, have water managers and decision makers encouraged to neglect groundwater resources more careful consideration of their costs and benefits could reveal that many proposed surface water projects are economically unsound and thus foster serious consideration of groundwater planning, control and management.

The question of public, private or common groundwater ownership is also important. Some people consider that a legal declaration that groundwater is in the public domain is the necessary foundation for acceptable groundwater development. This assumption is far from evident, and there are examples where groundwater in the public domain for many decades has been subject to somewhat chaotic management. Nevertheless, there is no disputing that promoting solidarity in the use of groundwater as a common good is vital, particularly in view of the fact that thousands of stakeholders may exist on a single aquifer of medium or large size. Groundwater management should be in the hands of these stakeholders under the supervision of the corresponding water authority.

Availability and consistency of information is a prerequisite to successful groundwater management. Development of adequate hydrogeological knowledge has to be a continuous process in which technology and education improve stakeholder participation and lead to the efficient use of the resource.

There is an urgent need to create appropriate institutions to manage aquifers so that all who benefit from them are made aware that if they pump permanently in excess

of the renewable recharge of groundwater, they may incur serious problems for themselves and for their children and grandchildren. Considering the aquifer as a shared common good brings with it the obligation to manage it in a participatory and responsible way. The recent report by Burke and Moench (2000) presents one of the more complete analyses on the social issues related to groundwater.

WATER AND CONFLICTS

Conflicts over water can and have caused violence. If water stress increases so too will social violence. However, violence at personal and local level does not generally translate into violence at the broader regional and international levels. In fact, water has been far more a medium for building community than a cause war (Asmal, 2000). Water management also confronts us with the reality of conflicting human rights, between preserving a traditional way of life and creating new opportunities for growth and by the reduction of malnutrition.

Conflicts over water arise from a variety of reasons. Although the problems associated with water crises are usually integrated around a watershed or river, the institutions both affecting and responding to these problems are not usually integrated, making it difficult for them to effectively tackle these problems. Water is forcing us to rethink our notions of security, dependency, and interdependency. Increasing interdependence through water sharing plans and infrastructure networks is often viewed as increasing vulnerability and dependence and reducing security. However, there is an alternative way to look at interdependence: as networks that will increase our flexibility and capacity to respond to the demands of nature, reduce our vulnerability to events such as droughts and floods and thereby increase our security (WHAT, 2000).

Water can be a superordinate ethic or value, the appeal to which is capable of coalescing conflicting interests and facilitating consensus building within and among societies. The symbolic content of water in terms of cleansing, healing, rebirth and reconciliation can provide a powerful tool for the cooperation and symbolic acts of reconciliations so necessary to conflict resolution in other areas of society. In a sense, negotiations over water use, themselves, could be seen as secular and ecumenical ritual of reconciliation and creativity.

In a world of increasing austerity and in an international system where incentives are crucial because of the lack of international enforcement mechanisms, it might be good to establish ethical guidelines for international lenders and donors, especially regarding the conditioning of water resource lending with cooperation among stakeholders and/or among and within countries.

CONCLUSION: TOWARD A NEW WATER ETHICS

This author thinks that the proposals of the UNESCO Working Group on the Ethics of Freshwater Uses (1998-1999), as presented in Llamas and Delli Priscoli (2000), continue to have value and are reproduced below with only minor changes.

The UNESCO Working Group agrees with the call for ethics to help guide water resource management into the third millennium. Commitments must be made to provide basic human water needs, provide basic water needs to maintain ecosystems, setting and maintaining minimum water quality standards, preventing pollution, taking precautionary action to prevent possible tragedy, assuming responsibility for downstream users, saving water and using it efficiently, minimising or not impairing the renewability of freshwater stocks and flows, generating better and more accessible water data, preventing and managing water conflicts peacefully, avoiding 'perverse subsidies' which are noxious for the economy and the environment, and making all aspects of water management more participatory.

In the longer run, social ethics will help to bring a new balance to water decisions; it will help guard us against 'gigantism' and 'technological triumphalism' on the one hand but also, equally importantly, guard against an unwarranted reverence of over romanticised past, a deification of nature and a 'technophobia.' Three basic elements for such ethics follow.

First, the ethics we require is not simply one of preservation. They should be built teleologically, on a sense of purpose and on an active co-designing with nature. Even restoration and preservation have come to mean conscious intervention or partnerships with nature. Nature is not static; it is in continuous evolution. The destructive powers of nature can be greater than anything that humans can dream of.

Second, the new ethics must be based on a balance between traditional human values regarding conservation and the use of new technological advances. Rarely have either worked alone and it is time to stop characterising them as operating one versus the other.

Third, the new ethics, even in our advanced technological age, should be based on finding a new balance between the sacred and the utilitarian in water. In water resource management it is necessary to rebalance the sacred and the utilitarian, the rational and emotional. Water resources managers need to understand the wisdom encoded in traditional, religious and secular symbols and in rituals surrounding water. Talking of such a balance means appreciating the intrinsic and broad value of water that is not captured in the traditional utilitarian calculation of transactions. It means recognising that water is not only a means to meeting other goals; it is also important as an end in itself.

NOTE

[1] This section has been mostly taken from Selborne's (2000) paper, which basically reproduced sections of the paper by Llamas (1999).

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HUMAN RIGHTS, ETHICS AND GOVERNANCE THE WORK OF THE WORLD HUMANITY ACTION TRUST

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ABSTRACT

Safe drinking water is essential to life, but for many millions of people, safe water is a dream. The report of the WHAT Water Commission draws attention to the tragedy that more than one billion people in the world lack access to safe drinking water and that annually, something of the order of four million people die prematurely from water-borne diseases. It quotes an United Nations Environment Programme statement that 'The world water cycle seems unlikely to be able to cope with the demands that will be made on it in the coming decades. Severe water shortages already hamper development in many parts of the world.'

BACKGROUND

The World Humanity Action Trust, (WHAT), was set up in 1993 following a lecture given in 1992 at the Royal Society in London by Sir Austin Bide, a former Chairman of the international drug company Glaxo. Sir Austin drew attention to the threats to the survival of humanity arising from the accelerating rate of scientific and technological development compared with the much slower rate of social progress. This struck a chord with a number of people, including Sir Maurice Laing, the former Head of the John Laing Construction Company. With funding support primarily from the Maurice Laing Foundation, Sir Austin and Sir Maurice set up the World Humanity Action Trust to seek possible improvements to the world's systems of governance.

In 1998, after a few false starts, WHAT created three commissions to consider the governance aspects of respectively water, fisheries and agricultural genetic diversity. These three topics were chosen because of the 'global commons' nature of their problems. That is, they all relate to resources that in the past have generally been seen as being freely available for use by mankind. The term 'global commons' is derived from the shared grazing systems on the village greens of feudal England and covers land and natural resources traditionally seen as being held communally. Such assets pose a special problem as a form of 'public good' subject to degradation or destruction from overuse. This is likely to arise from the tendency of individuals to maximise self-interest, it seldom being in the short-term self-interest of any harvester or consumer voluntarily to limit their consumption.

The trustees of WHAT hoped that the global commons link between the topics chosen for the commissions would mean that the conclusions and recommendations of the three commissions would contain some common factors applicable overall to systems of governance. This hope was realised and the work of the commissions led to the launch in September 2000 of the WHAT report 'Governance for a Sustainable Future' (Carley and Christie, 2000). The full document consists of the reports of the three commissions, with an integrative report 'The World's Commons: The Challenge of Governance', written by Michael Carley and Ian Christie. WHAT defines governance as 'the framework of social and economic systems and legal and political structures through which humanity manages itself'. Each of the commission reports is valuable in its own right as an analysis of the relevant technical issues and their implications for governance systems. The Carley/Christie document, combines the governance aspects of the individual reports with their own thoughts to produce recommendations for improvements in governance systems. This paper attempts to bring out some of the key messages having relevance to water.

The importance of water

Safe drinking water is essential to life, but for many millions of people, safe water is a dream. The report of the WHAT, Water Commission draws attention to the tragedy that more than one billion people in the world lack access to safe drinking water and that annually, something of the order of four million people die prematurely from water-borne diseases. It quotes an United Nations Environment Programme statement that 'The world water cycle seems unlikely to be able to cope with the demands that will be made on it in the coming decades. Severe water shortages already hamper development in many parts of the world.'

The report also mentions a World Bank report estimating that the amount of water made unusable by pollution is almost as great as the amount used by the human economy. So the 'single issue' approach to water should be avoided in favour of a broader, 'joined-up' approach. Drinking water must be seen in the context of systems for treatment of domestic and industrial wastewater as well as the need for irrigation water for food production and for water for industrial use. In other words, water requires integrated planning and organisation, often beyond national boundaries, that takes proper account of the needs of different societies and sectors of society, as well as of the costs, benefits and risks of particular decisions or policies. Only this approach offers hope of providing adequate water services to all the people of the world.

There are signs of wider recognition of these principles. For example, in August 2000, at a seminar organised by the Stockholm International Water Institute in Stockholm, there was a presentation by Q. K. Ahmad (Ahmed, 2000), from Bangladesh on promoting sustainable development in the Ganges-Brahmaputra-Meghna, (the GBM), region. He said

that ten per cent of the world's human population lives in this region, which includes Bangladesh, India, Nepal, Bhutan and Tibet, China, but it contains only 1.2 per cent of the world's land area. The region has abundant natural resources and the human potential and the urge for development abounds but it remains home to the largest concentration of the poor in the world. There has been mistrust among the regional countries resulting in a failure to forge an appropriate regime for regional cooperation. Ahmad described two major breakthroughs in 1996. These were the Mahakali Treaty between India and Nepal and the Ganges Treaty between Bangladesh and India. In his view, the opportunity created by the signing of these treaties had not been seized as fast as it should have been.

Ahmad said that problems arising in the implementation of any treaty must be resolved to the satisfaction of the parties involved and a worthwhile process of regional cooperation forged quickly. He asked 'What is the vision that may inspirit the process of cooperation in the region?' and suggested it is best construed in terms of sustainable development, the core elements of which have economic, social and environmental dimensions. Ahmad added that equity, participation, good governance and cultural imperatives are crucial considerations.

In Europe, the setting of drinking water standards provides an interesting example of the outcome of the 'single issue' approach. The limits set in the European Drinking Water Directive were to a large extent based on the numbers in the World Health Organisation Guidelines. These guidelines are broadly set to provide safety on the basis of lifetime exposure at the concentrations listed, and are often translated into an annual, or occasionally a seasonal mean. In the European Directive, the same or similar figures are described as Maximum Admissible Concentrations and therefore, apply to each individual sample. It took some time in parts of the European Union for the difference between maximum and mean to be fully appreciated. Once it was understood, the additional costs of compliance with maximum rather than mean limits were quickly seen to be extremely high. There is little evidence of any significant public health benefit from this particular application of the World Health Organisation Guidelines and public health experts could find much better ways of using the additional resources used to secure compliance. But it is difficult to put forward that view publicly without being portrayed in the press as someone more concerned with money than with health.

Such emotions ignore the fact that no society is so wealthy that it can afford to do all the things that are desirable for the benefit of its members. Therefore, expenditure in one area necessarily reduces the funds available for improvements in other areas. That is why it is important to have reliable systems for comparing risks, costs and benefits across the range of human activities. As has been said, '…We (in the UK) should…bear in mind that some of our concerns about concentrations of parts per billion might just seem like self-indulgence to many in the Third World' (Jeffery, 1991).

Introduction to the report of the World Humanity Action Trust

There are many problems facing humanity and the WHAT report welcomes the growing interest in global governance. In particular, it mentions the seven core values for such governance proposed in 1995 by the Commission on Global Governance (CGS, 1995), an independent group of 28 world leaders. The values listed were respect for human life, liberty, justice, equity, mutual respect, caring and integrity.

World problems include growth in world population; pollution and climate change; increasing world-wide availability of ever more efficient means of destruction, and international crime, often associated with illicit drugs. Most of these threats are not new so why is WHAT so concerned? Perhaps an example from microbiology is helpful. Closed system bacterial populations evolve through three phases. First, there is a lag phase of relatively slow growth. That is followed by an exponential growth phase after which a combination of lack of an energy source and an accumulation of toxic metabolic products leads to the death phase during which the population collapses. That seems to have uncomfortable parallels with the state of humanity today. Growth in world population was in an exponential growth phase throughout the 20th century, which suggests a need to address the fundamental issues underlying problems of the global commons such as water resources.

There are many obstacles to progress. They include what the former World Bank economist Herman Daly called a 'frontier economy'. This assumes that we can draw on an inexhaustible supply of natural resources and that man-made capital can invariably substitute for natural capital in improving human quality of life. If the assumption were ever true, it is certainly not true now. There are few or no substitutes for the natural capital being depleted by the exploding rates of resource consumption associated mainly with economic growth in 'developed' societies. The frontier is gone, but 'frontier assumptions' continue to condition the activity of modern economies.

Another obstacle is what Baker in 1989 called the 'administrative trap'(Baker, 1989). He described it in this way: 'Administrative structures (are) typically organised vertically between sectoral or functional, ministries and departments (Agriculture, Education, Health, etc.). This works reasonably well until the system encounters a problem of a very broad and highly integrated nature – such as desertification. Then it tackles only the parts which are identifiable to each ministry and each ministry tackles the symptom as a problem in, and of, itself.'

These single-issue attitudes may also be seen in some NGOs and they may often lead to false priorities. Carley and Christie also note that 'Coordination among donors is unlikely, due to differences in long-term goals and even short-term local objectives, but it is also sometimes due to no more than a sense of competition'. They quote Whittington and Calhoun (1990), arguing that 'the heart of the problem is a patronising

attitude of donors based on a mistaken belief in their own bureaucracy and in the inefficiency of the host country's bureaucracy'.

The failure to link 'Top-down' with 'Bottom-up' is another difficulty identified in the WHAT report. Carley and Christie mention 'the common failure of understanding…between the policy levels of government and multilateral organisations and small-scale production units or individual resource harvesters, say in fishing or agriculture, who may generate substantial cumulative environmental impacts'. They go on 'Long established traditional systems at community level for stewardship of common resources often work effectively…'. They refer to Postel (2000) reporting on the development of local management systems in Mexico, where farmers' associations have taken over much of the responsibility from government and subsidies have been reduced, with a corresponding rise in water fees. Such rises, when well designed to give incentives for careful use, and when implemented by locally trusted and representative bodies, are a vital part of more sustainable water management at the grassroots level.

Carley and Christie return to the lingering hold of frontier economics and note our failure to develop a consensual philosophy of resource conservation that enables us to devise workable solutions for managing the commons. By 'consensual', they mean a 'philosophy which bridges nations and cultures and…which links the interests of the world's rich, poor and middle income residents in a common concern for resource conservation'. They continue: 'Such a philosophy would also have to link ethical concerns about intergenerational equity and social justice to practical and quantitative systems for allocating opportunities for resource harvesting on the basis of scientific assessments of the 'carrying capacity' of ecosystems…governance of key environmental resources depends not only on better scientific knowledge…but (also) on richer political processes which open up debate about fairness and the long-term effects of different approaches to resource management. These should include new economic and fiscal approaches that seek to reflect the value of environmental goods more effectively and clearly in market pricing.

The messages of the World Humanity Action Trust Report

The report of the WHAT Commission on water makes many important specific points and recommendations but it also strongly influenced the Carley and Christie integrating document, 'The World's Commons: The Challenge of Governance'. This has two broad aspects. One is economic and the other combines ethical, social and political issues. Taken together, they point the way towards a comprehensive review of the entire range of governance systems through which humanity manages its affairs. Some of the existing systems are well understood whilst others are ill defined and subject to different interpretations.

The economic approach of the report recognises the need for a proper method of valuing and pricing natural resources and the environment and for use of discount rates that take into account the likely contribution to sustainability of proposals being subjected to economic appraisal.

The report asks 'How can market prices be made to signal the importance of the value of freshwater, biodiversity and sustainable fisheries management?' At present, even in the rich West, most consumers do not receive price signals that reflect the fragility of resources such as water. As a result, water tends to be seen as a 'free good', wasted in considerable quantities. Part of this arises from usually well-meaning attempts to solve single issue problems through use of subsidies. The report quotes the estimates of the environmental scientist Norman Myers that global subsidy for unsustainable practices in agriculture, transport and energy is over US$ 1 trillion a year, distorting markets and institutionalising unsustainable resource use patterns (Myers, 1998).

The report proposes incentives for sustainable production and consumption and the identification and elimination of the perverse subsidies described by Myers. Instead, at least in part, the money should be used to fund sustainable development schemes and ease the pain of transition for vulnerable groups.

Much of the prosperity of the developed world over the past 250 years has been based on the implicit assumption that natural resources are freely available to be exploited at no cost beyond that of extracting and preparing them for use. Thus the development of the steam engine by people like Newcomen and Watt was the foundation of the Industrial Revolution in the UK, but the exploitation of steam power depended on the availability of vast quantities of cheap coal. That coal was produced at low cost partly because of the failure to allocate any intrinsic value to the coal itself.

To this day, national governments treat the use or disposal of natural resources as a contribution to Gross Domestic Product. Even worse, while those same governments correctly require companies to depreciate capital assets so as to provide for their replacement over their useful lives, governments work entirely on cash flow with no provision for depreciation of assets as they are used. As a result, most natural resources are sold and used at a price that does not represent the true value. This is especially true of most forms of energy. When the perverse subsidies of Norman Myers are added to the picture, it becomes increasingly obvious that current patterns of human behaviour are unsustainable. The WHAT report quotes Stewart Brand (Brand, 1999) as seeing the tragedy of the commons as a 'classic case of pathological feedback where each player is rewarded rather than punished for wasting the common resource'.

The ethical, social and political approach of the report may be summarised as being a call for 'joined-up' policy making. The 'audit of governance' carried out by the WHAT commissions makes it plain that many current approaches, whether founded on rational

self-interest or on ethical beliefs, are as likely to be contributing to as resolving global, regional and national problems. Further, too many collective initiatives by governments lead to decisions that represent the lowest common denominator of national interests and deliver too little too late.

'Governance for a Sustainable Future' identifies two sets of issues, ecological and social, to be addressed when considering how far present patterns of development may be sustained. It asks how we can avoid irreversible degradation of the basic 'life support systems' of the planet (the climate, soils, freshwater sources and natural mechanisms for recycling, diluting and dispersing wastes). The report then points out that more than a billion people are afflicted by 'absolute' levels of poverty, growing levels of malnutrition and ill-health caused by lack of access to clean water. It comments that 'the persistent dire poverty of a fifth of the world's population is a fundamental challenge and reproach to policymakers'.

The report then draws attention to the increasing interdependence of North and South. This is shown by examples such as the growing vulnerability of developing countries to climate change brought about disproportionately by emissions from the rich world and the risk to public health in the developed world from poverty-related diseases carried across the globe through air travel. It quotes an United Nations statement that 'it is not surprising that vital long-term environmental concerns receive scant attention from the poor or their political leaders, given that the needs for day-to-day survival press so heavily'. The report goes on 'In the rich world, scarcity of water and fisheries are issues which are just beginning to rise up the political agenda, an unfamiliar and disquieting development for societies which feel prosperous and which are dominated by traditional economic valuations and financial and technological priorities… 2025 the number of people living in countries at risk of water stress… is projected to rise from 470 million now to some 3 billion, a six-fold increase, with Africa and South Asia most affected' (Postel, 2000).

CONCLUSION

The report identifies four fundamentals of the governance of common environmental resources. They are:

- The need for debate on the mechanisms by which we value the environment and through which we can price scarce resources.
- The need for policies to rest on a democratic basis of meaningful dialogue and involvement in framing problems and solutions on the part of a much wider range of stakeholders than are generally engaged in policy making on environmental resources.

- The need for consensus to be fostered and conflicts to be tackled with the assistance of independent, 'transcendent' organisations beyond the control of the State, political parties and business, capable of commanding trust, expertise and resources for impartial research.
- The need for debate and learning to be informed by a shared ethic of resource conservation and equitable access to resources, without which conflicts will persist and consensus on problems and solutions will continue to be shallow and imperfectly realised in practical policy.

It may be summed up as emphasising the importance of horizontal and vertical integration in policy making to avoid the distortions and mistaken priorities that so easily result from single-issue judgements. We need processes through which producers, consumers, non-governmental organisations, (NGOs), businesses and other stakeholders as well as governments can all have a voice in the design and implementation of solutions to problems of resources and the environment, including their valuation. To be effective, this requires improved techniques for risk and cost/benefit analysis. Ultimately, the world could develop a shared framework of values and culture of responsibility towards managing our planet making possible a truly sustainable future for humanity. This would be the real Utopia.

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WHICH RIGHTS ARE RIGHTS? WATER RIGHTS, CULTURE, AND UNDERLYING VALUES

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ABSTRACT

Over the past decade there has been increasing alarm worldwide about water scarcity, which, it is feared, will lead to massive malnutrition and famines, thirst, and unhygienic dwelling conditions as well as to violent clashes among different users and even wars between nations. Consequently, as a way of mitigating possible conflicts over increasingly scarce water resources there has been increased attention on clarifying what water rights entail. This in itself has raised another conflict: a conflict over the way in which water rights are defined. Much of the international debate has posed the issue as a simple dichotomy between economic efficiency and basic welfare or human rights. A closer look at the multiple forms of water rights derived from state, customary, local, and religious laws, however, reveals more complexity in the principles and values underlying how rights are defined, both in terms of abstract and specific situations as well as in terms of how they are actualised or put into practice by different parties. Both water rights and the laws from which they are derived are linked to wider cultural meanings and values associated with water and notions about what is fair and just or equitable. Often, several laws and notions of equity coexist and interact in a given social field, such as a community, village, or nation state. There may, for example, be a different constellation of rights and different notions of equity concerning drinking water than concurring irrigation or environmental uses. Therefore, when discussing water rights, it is important not to speak of water in general but to disaggregate water uses and water property regimes; only thus will we understand the plurality of values, meanings and notions of equity attached to water. This paper discusses the links between water rights and the broader meanings, values, and notions of equity attached to water, as reflected in state local laws and selected religious laws. Different conglomerations of rights to water (understood broadly to include both rights to use and rights to control or make decisions) for different uses and in different water (property) rights regimes are examined. More specifically, the state laws of selected Western and non-Western countries; Hindu, Muslim and Christian laws (especially those relating to drinking water); and several local or customary laws dealing with water are discussed. The paper argues that, rather than seeking a single, hegemonic type of water law or valuation of water, recognising the pluralistic legal frameworks, types of rights, and meanings of water is not only a more realistic viewpoint, but also one which can lead to more productive negotiations over water rights and water use.

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INTRODUCTION

Throughout history, humans have been aware of the value of water. People, plants, and animals live or die depending on their water consumption. Cities and states rise or fall depending on their control over water. Religions link water to the sacred and divine.

As human populations and water consumption have grown dramatically over the last 50 years, water scarcity has been increasing worldwide, even in places that once seemed water abundant. With scarcity has come greater attention to clarifying water rights as a way of mitigating conflict over water. The result has been competitive not only over water itself, but also among different ways of defining rights, and the underlying values and meanings placed on water.

Much of the current international debate over how to handle water scarcity has posed the underlying question of values of water as a simple dichotomy between economic efficiency and basic welfare or human rights. This was exemplified in March 2000, at the Second World Water Forum in the Hague, where the Water Vision Commission submitted a report recommending full-cost pricing of water services and measures to ensure that water was used efficiently. The forum of non-governmental organisations (NGOs), trade unions, and a number of protesters countered by insisting that 'a clean healthy environment and access to basic water and sanitation services are universal rights, and cannot therefore be negotiated as commodities' (NGO Forum, 2000). Related to this is a debate over whether water services and water resources themselves should be privatised, nationalised, or transferred to communities. Advocates of economic efficiency are generally associated with support for privatisation, whereas supporters of the welfare or human rights value of water often support state or community management of water services. A third group places the highest value on environmental uses of water, arguing that anthropogenic uses of water should be minimised in order to protect natural habitats.

Posed in terms of such polar positions, the debate over water values generates more heat than light. A closer look at the multiple forms of water rights derived from state, customary, local, or religious laws, however reveals more complexity in the principles and values regarding water, including religious, community, and livelihood values, that is missing from most international discussions. These values, which are embedded in cultures, underlie how rights are defined, both in the abstract and in specific situations. They also affect how water rights are actualised by different parties.

In this paper, we examine the link between water rights and the broader meanings, values, and notions of equity attached to water, as reflected in state, local and selected religious laws. We examine different conglomerations of rights to water (understood broadly to include both rights to use and rights to control or make decisions) for different uses. More specifically, we will discuss the state laws of selected Western and non-Western countries; Hindu, Muslim and Christian laws (especially those relating to drinking water);

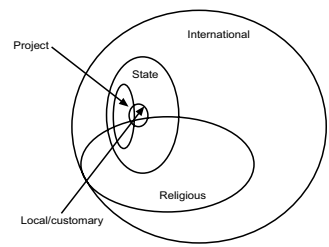
and several local or customary laws dealing with water. The concluding section argues that, rather than seeking a single, hegemonic type of water law or valuation of water, recognising the pluralistic legal frameworks, types of rights, and meanings of water is not only more realistic viewpoint, but also one which can lead to more productive negotiations over water rights and water use.

LAW, RIGHTS, AND VALUES

Law and legal pluralism

Rights to resources derive from law, which in turn is based on underlying cultural values, such as those of justice, equity, solidarity, and hierarchy, on one hand and cultural meanings and values of resources on the other. The very term 'rights' in English conveys a sense of what is fair, just, and equitable. There is, however no such thing as a single, unitary right, nor is there a single, consistent law or a single consistent legal system. In most domains of social life and in most social settings more than one legal system (defined broadly) is relevant. For many social scientists, especially anthropologists, law is not limited to acts, rules, administrative orders and court decisions, enacted or made by various state organs. Law is understood very broadly, at least by many legal anthropologists, as cognitive and normative orders that are generated and maintained in a social field.[1] Any social field, such as a village, an ethnic community, an association, or a state, is able to generate and enforce rules or normative and cognitive repertoires. It is thus possible to have various kinds of law, including state law, religious law, customary law, donor or project law, and local law.

Figure 1
Illustration of Overlapping Legal Orders Related to Water



The coexistence and interaction of multiple legal orders within a single social setting or domain of social life is called legal pluralism.[2] It enables individuals to make use of more than one law in order to rationalise and legitimise their decisions and behaviour. The different overlapping legal orders that can apply to a particular situation regarding water are illustrated in figure 1. Which specific law or combination of laws individuals or

groups will use or orient themselves to in specific cases 'will mostly be a matter of expediency, of local knowledge, perceived contexts of interaction, and power relations' (Spiertz, 2000). During disputes and negotiations, claims are justified with reference to legal rules. In a process known as forum shopping, disputants use different normative repertoires in different contexts or forums depending on which law or which interpretation of law they believe is most likely to support their claims (K. von Benda-Beckmann, 1984).[3]

The different normative and cognitive orders may be sharply differentiated in some contexts, as for example, in the courts, but they are less sharply differentiated in the everyday life of local communities. At the local level we find a mixture of several normative orders: long historical tradition, e.g., customary law,[4] new forms of self-regulation, elements of old and new state laws, and donor or project law (regulations). This whole mixture of norms and rules that are expressed and used at the local level is called local law (F. and K. von Benda-Beckmann and Spiertz, 1997).

Water rights

The term 'water rights' is understood in different ways.[5] It is often interpreted narrowly, for example, by many lawyers and irrigation management experts, to mean the right to use a share of water allocated to an individual, a water users' association, a company, or a district by a statal or para-statal agency or a community (Teerink and Nakashima, 1993). Others link water rights to a system of water allocation (Uphoff, 1986; Brewer *et al*., 1997). This understanding of the term has the virtue of suggesting not just water shares but also the mechanism of allocating shares. In contrast, scholars using either the common property framework or a legal-anthropological perspective offer a broader and more useful approach that regards property rights as relationships among people with regard to a physical resource. In this view, water rights, like property rights in general, are better understood not as a single right but as a bundle of rights, which includes several types and levels of rights.

Following Wiber's (1992) approach to property rights in general, in this paper we define water rights as claims to use or control water by an individual or group that are recognised as legitimate by a collectivity larger than the claimants and that are protected by law. Individuals or groups (users, communities, corporations, states, etc.) may make claims of various kinds other resources. They include the rights to use a resource and derive income from it, the rights to control use and to make rules regarding resource use and users, as well as the right to transfer rights to the resource to another through sale, lease, gift, or inheritance.[6] These various kinds of rights may be grouped into two broad categories of rights: use rights of access and withdrawal, and decision making rights of regulation, control and decision making (Schalger and Ostrom, 1992; F. and K. Benda-Beckmann and Spiertz, 1997; Pradhan, 1994; Pradhan and Brewer, 1998; Meinzen-Dick

and Pradhan, 2000). Decision making rights may also be considered as rights of governance (Pradhan, 2000b). To fully understand water rights it is necessary to address both use and control rights, and not just use rights as is often done in some literature.

It is not sufficient to assert claims to a resource: unless claims are accepted by a collectivity larger than the claimants, they are not considered legitimate. The relevant legitimising institution often varies. Depending on the context, it may be a users' group, a village or ethnic community, a village council, or a state agency. These legitimising institutions or collectivities often compete, offer alternative legitimacies based on different laws (state, customary, local, religious, etc.), and, hence, define water rights and rights holders differently. Claims accepted and validated as legitimate by one collectivity or law and thus recognised as rights are not necessarily recognised and accepted as valid by another collectivity or law.

The importance of underlying values in legitimating water rights thus becomes clear. Claims to and recognition of claims over resources are based not only on specific laws, principles, and rules, but also on wider cultural norms and values. Wider cultural norms or values can themselves be one law among other laws that may be called upon to define rights and spell out who has rights, the types of rights they have, and the procedures and conditions by which persons (individual or corporate) establish, maintain, transfer and lose rights. In most cases, individuals shop for and select specific law from among the plural legal orders most suitable to their claims. But they may also take recourse to more diffuse normative orders in order to legitimise their claims or decisions. Which norms or laws are considered valid and acceptable for a particular claim, by a specific person is open to negotiation and contestation and depends a lot on social and especially power relations between claimants. In some cases, wider cultural values, such as those of community solidarity, 'common property' notions of natural resources, and rules applicable in times of distress, may be used to acquire 'tolerated access' but not necessarily rights to resources (see, Pradhan and Pradhan, 2000; and Sodemba and, Pradhan, 2000; Meinzen-Dick and Pradhan, 2000 for other examples). Over time and in some contexts, these wider values may be accepted as specific norms or laws relevant for specific claims, and the claimants may be able to acquire rights instead of tolerated access.

The concept of water rights thus does not refer to a single and unitary right but to bundles of rights that vary across property regimes, legal orders and cultures (meanings and values of water). Moreover, the bundles of rights are not static but complex, dynamic, flexible, and subject to change because of ecological, livelihood, knowledge and social and political uncertainties (Menizen-Dick and R. Pradhan, 2000; F. and K. von Benda-Beckmann, 2000).

It is important to differentiate between general rights in principle and specific rights that an individual can avail. F. and K. von Benda-Beckmann (2000) refer to these rights as

categorical and concretised rights, respectively, or 'the legal construction of rights from the actual social relationships that connect concrete right holding individuals, groups and associations with concrete and demarcated resources' (F. and K. von Benda-Beckmann and Spiertz, 1997). Beyond categorical and concretised rights, it is also important to look at the actualisation of rights, the ability of an individual to make use of a resource or to make decisions about it.

The configurations of bundles of rights to water differ not only across different laws and cultures but even with the same law or culture across different property regimes, sources of water, and uses of water. The bundles of rights to water in a water source such as a river, for example, often differ from rights to water once it is appropriated and conveyed by infrastructure. Similarly, there often are different bundles of rights to water for different uses, such as religious or domestic uses and more economic uses of water. Some of the confusion in the debate over water rights is related to the fact that distinctions among different uses or sources of water are not made. For example, advocates of the human rights value of water refer mainly to drinking and domestic uses of water (and perhaps to some extent, to irrigation and environmental uses) but rarely to commercial or industrial uses of water.

EXAMPLES OF DIFFERENT LAWS, CULTURAL VALUES AND MEANINGS OF WATER

The international discourse regarding water and water rights, whatever its differences, in general assumes the primacy of state and even international laws over religious and local laws. Before the many meanings, uses and rights relating to water are erroneously collapsed into a single meaning, use and right, however, it is useful to step back and analyse the different meanings and bundles of rights relating to water in different kinds of laws and in different cultures. In this section, we briefly describe broad patterns of values underlying different types of law, moving from global law to the most context-specific law: international declarations, state law, project law, religious law, customary law and local law pertaining to water.

International law and declarations

The past decade has witnessed an increasing number of international forums and declarations regarding water. The 1992 International Conference on Water and the Environment generated the Dublin Principles that were endorsed drinking water-related discussions at the Rio Summit. These principles reflected relatively uncontroversial underlying values or concerns with the environment (water as a unitary resource), local participation, and gender equity (women as major water users should be involved in water management). However,

they also introduced a relatively more controversial principle: water is an economic good, with an economic valuation. This economic valuation and emphasis on efficiency was expanded in the World Bank's (1993) Water Policy paper and was reflected in that organisation's push for water markets and water charges in its lending programmes.

The economic valuation of water has received increasing attention since the Second World Water Forum in 2000. A report by the Vision Commission (2000) for the forum began with a statement reflecting the many values of water:

> Water is life. Every human being, now and in the future, should have access to safe water for drinking, appropriate sanitation, and enough food and energy at reasonable cost. Providing adequate water to meet these basic needs must be done in an equitable manner that works in harmony with nature, for water is the basis for all living ecosystems and habitats and part of an immutable hydrological cycle that must be respected if the development of human activity and well being is to be sustainable.

However, it was the subsequent recommendations focusing on efficiency and pricing that drew the most attention and protest. The commission's recommendation on pricing was only that users should pay the full cost of delivering water, not an economic 'rent' or charge for the value of the resource itself, but this point was generally ignored by both proponents and opponents in the subsequent debate. As noted above, the NGO forum and trade unions argued that water should not be commodified and pressed instead for water to be recognised as a basic human right.

International declarations concerning water are important in shaping discourse and, to some extent, norms regarding water, but they do not generally have a direct effect on water rights. One notable exception is the Ramsar Convention on Wetlands; stressing the value of water for environmental protection rather than human use, this document has been ratified as an international treaty. In other cases, international declarations only have an effect if they are adopted by states and translated into national law or are pushed by donor organisations to be incorporated into project regulations. Neither the Vision Commission's recommendations of full cost pricing nor the NGO's demands that water be recognised as a basic human right were endorsed by the accompanying Ministerial Forum at the Second World Water Forum in the Hague, so the debate has been taken to the national level on a case by case basis. For example, the Asian Development Bank and the World Bank have supported the government of Sri Lanka in devising a new Water Resources Policy (adopted March 2000) in and revising its Water Resources Act to include tradable water entitlements that allow individuals to claim 'rent' on water resources. National and international environmental

NGOs (e.g. Environmental Foundation and Friends of the Earth) oppose this regulation on the grounds that 'water is a basic need of any living form,' and that the proposed changes would threaten the environment, food security, and the ability of the poor to get water (Withange, 2001).

Statutory law

In many countries the state, by means of state law, claims for itself rights to regulate, control, manage and even own natural resources such as water. There are several reasons for a state's claims to such rights, related to state authority, national welfare and development, and revenue mobilisation. First, vital natural resources are considered public goods to be regulated, managed and perhaps even utilised by the state for public welfare. Many countries adhere to some form of Public Trust Doctrine, a principle dating back at least to Roman law, which maintains that the state holds navigable waters and certain other water resources as a common heritage for the benefit of the people. Under this doctrine, control over water is an aspect of sovereignty which the state cannot give up (Ingram and Oggins, 1992). In fact, this is more than a legal principle; it is a political reality: a state that cannot meet the basic water needs of its population is not likely to survive. The welfare aspect of the state's involvement in water resources is especially strong and relevant, at least as far as rhetoric goes, in terms of domestic water uses (drinking water). The construction and management of flood control mechanisms, irrigation systems, and even hydroelectricity plants are also seen as part of the welfare functions of the state. Closely related to its welfare functions are the development functions of a state: the state (often with international aid) is the major actor in the development of water resources and other infrastructures which lead to economic growth.

Water resources, besides being public goods, are also sources of revenue for the state. The revenue generated directly through taxes and fees for the utilisation of water resources may be modest, but at least in the past, the governments of South Asian countries have raised a large part of the revenues through high taxes on irrigated land. The construction of irrigation structures thus served the dual purpose of providing welfare service to the population and raising more revenue for the state (and more income for agrarian elites). More recently, revenue from hydroelectricity has become significant for countries such as Bhutan.

State laws reflect the values accorded to water as a public good and as a source of revenue and the state's own roles in providing welfare and development and earning revenue. But despite these common elements, states differ in the relative emphasis they give to different values and even in how they define values such as 'equity' (Boelens and Davila, 1998). These differences are seen not only among countries, but even within a single country over time. For example, as the post-apartheid government of

South Africa took on functions and responsibilities such as ensuring the equitable distribution of water to all, providing for health and sanitation, and ensuring a sustainable environment, its water law was reformed to award the highest priority to meeting the basic water needs of the whole population as well as to preserving base stream flows for ecological services.

In 1967, the socialist Allende government of Chile passed a constitutional amendment declaring that all water was public property. This was done not only to extend state control, but also to allow the government to redistribute water along with carrying out its plans for land reform both for the benefit of small farmers. The principle underlying these reforms was the desire to produce a more equitable society, with equity defined in terms of giving the poor a fair chance and share (Huizer, 1998). With the fall of the socialist regime, the military government passed a new Water Code in 1981. The principles underlying this new code were legal security for private property rights and productive and efficient water use (Bauer, 1998). Water use rights were defined as permanent (for base flow) or contingent (for surplus water, consumptive and non-consumptive (Hearne and Easter, 1995). Although the rights were assigned to individuals, they could be traded in the market; recourse could be found into the courts, but there was limited control by government agencies. Both secure rights and tradability have been regarded as mechanisms to increase the economic productivity and efficiency of use of water, security of tenure by providing incentives to invest in water-related production and tradability by allowing market forces and price to create incentives for efficient water use.

Chile has become somewhat of a showpiece for tradable water rights, and the neo-liberal values and approaches of its Water Code have been promoted in other countries, especially as they are pushed by the International Monetary Fund and other international donors or lending agencies to liberalise their economies and promote private property as a means of stimulating economic growth. Reforms similar to the Chilean Water Code have been proposed in Peru and Equador, for example, but not adopted and implemented because of local resistance. In these countries we see the dichotomy of values, mentioned in the introduction, emerging. With the privatisation of water and other public goods, the state is no longer considered the major provider of welfare or the major actor in stimulating economic growth, though it may continue to regulate water uses and users.

Project law and regulations

For most water users, the type of law that has most immediate application for defining water rights are the rules and regulations of particular water projects. This applies to both irrigation and domestic water supply projects. For example, conventional government-managed irrigation systems may specify that farmers with land in a defined command area are entitled to receive

water during certain seasons according to a certain rotation schedule (use rights). Projects that seek to promote participatory irrigation management may go further to define some decision making rights for the users, usually through some form of water user group. Drinking water projects may define groups that are eligible to draw water from a well or standpipe even and stipulate that only households that pay their water charges are eligible. Domestic water supply systems in many cities however do not comprise water supply and sanitation projects that involve users, especially in decisions regarding the level of service.

Within domestic water projects, welfare objectives and values are usually prominent, at least in rhetoric, whereas values of productivity, efficiency, and food security may be more apparent in irrigation projects. Both types of projects often have a concern with equity, but define the concept in very different ways. In domestic water projects, equity is more likely to mean that all households should get a base amount of water, and may be reflected in graduated block tariffs so that those (usually wealthier) households that consume more water pay more for it. In government-managed irrigation projects, equity is defined as providing equal water per unit of land, not per household.[11]

The importance of the economic valuation of water in project regulations has varied among countries and over time. Although irrigation is considered economically productive use of water, most countries (including the United States as well as many developing countries) have subsidised irrigation in order to promote domestic food security, employment, and rural development and to gain political patronage. British colonial authorities in India invested in 'productive' irrigation systems, from which they could extract sufficient revenues to earn a profit, but eventually had to develop 'protective' irrigation systems for which revenues did not cover costs in order to provide stable food supplies in time of drought. After Independence, cost recovery was not apparently valued in project rules, as fees were not set at levels that would cover ongoing operation and maintenance costs, much less capital costs or an economic 'rent' on the water itself. Domestic water supply projects have generally given even less emphasis on economic valuation, because of their emphasis on meeting basic needs.

In the past 10 years however, project regulations have begun placing much more emphasis on cost recovery. This is driven, in large part, by donor concerns about the financial sustainability of projects and the efficiency of water use. Cost recovery is assumed to be crucial for both of these objectives. International discussions of the economic value of water have added fuel to the emphasis on cost recovery. Furthermore, the fiscal crises of many states have not left them with the resources to fund water infrastructure development without external donors, multilateral financing, or private sector financing – all of which are likely to require cost recovery guarantees. This means that rights to water within projects may be contingent upon the payment of service charges, whether by individuals or by groups. For example, in the domestic water supply system in Kirindi Oya, Sri Lanka,

BOX: 1
VALUES UNDERLYING STATUTORY LAW IN NEPAL

The case of Nepal is typical of developing countries, especially those in Asia. Until 1950, the Nepalese state's role in water development was confined mainly to irrigation use; An increased irrigated agriculture in order to enhance the revenue of the state and income of the elites.[7] After 1950, the nature and functioning of the state has changed from being mainly an instrument to maintain law and order and to collect revenue to one that also plans, regulates and implements developmental and welfare activities, mainly with foreign aid. New laws have been enacted empowering the state to increase its control, regulation and management of natural resources for the benefit of all its citizens.[8] The self-proclaimed welfare and developmental functions of the state regarding water are stated in the preambles to the various water resources acts (e.g., the Water Resources Act, 1992). The development of irrigation and other water infrastructures has been oriented more toward the welfare and development functions of the state and less toward revenue generation. Except in the case of drinking water, water has been perceived mainly as a resource to be used for economic growth. More recently water has been perceived mainly as blue gold, a potential source of hydro-dollars and revenue for the state and commissions and income for a few privileged elites (Pradhan, 2000a). The environmental aspect of water has also received some attention in the country's policies and laws. What is lacking in these laws and policies however, is recognition of the social, cultural and religious values and meanings of water. In other words, for the state, as reflected in state laws, water is mainly a resource to be used for economic growth, revenue and income generation and, in the case of domestic water, for hygiene and sanitation (welfare functions); it is not perceived as a signifier of social, cultural or religious values and meanings.

The lack of religious meaning in the national water law may not seem strange for many countries, but it represents a historic shift in Nepal. From 1854 to 1950, the primary source of law in Nepal was a compendium of laws known as Muluki Ain, which was supplemented by various decrees and orders.[9] The Muluki Ain was based to a large extent on Hindu scriptures, mainly Naradasmriti but also *Manusmriti*. It had only one chapter which detailed provisions relating to water, particularly for irrigation, and the provisions relating to water was part of a chapter mainly concerned with the reclamation and cultivation of land. A large part of the Ain was devoted to inter-caste relations based largely on Hindu religious texts.[10] Water was a marker of caste hierarchy (between the higher castes from which one could accept water for drinking, rituals, etc. (*pani chalne*) and lower castes, from which one could not accept water for drinking (*pani nachalne*). There were two divisions of the pani nachalne castes. With the higher of these castes, such as Muslims, butchers, and washermen, physical contact did not require purification with water, whereas with the lower castes (untouchable castes proper) such as shoemakers, sweepers, etc., contact required purification by sprinkling water on the body (*chito halnu*). In the new Muluki Ain of 1964, provisions relating to caste relations and hierarchy were not included. Although water is no longer a marker of castes relations in the state law it continues to be relevant, with some modifications, in the daily lives of many Nepalese Hindus but not so much among non-Hindu communities.

each standpipe serves a group of around ten households, but those groups that do not pay their monthly charge (or that are considered to wastewater or use it for unauthorised purposes, e.g. bathing at the tap) can be cut off.

The extent to which project law reflects local values depends on the interests and values, source of funding. Farmer-managed irrigation systems generate rules that reflect the members' (or local elites') values, but agency-managed systems are more likely to reflect state values, unless they have an exceptionally participatory structure and orientation. For the many systems funded by external donors, project law is likely to incorporate some key provisions (e.g. cost recovery or economic pricing) that reflect their values. The influence of religious and international values follows this continuum: religious values may be reflected in the regulations of user-managed systems (e.g. Balinese *subaks*, or local drinking water supply systems), whereas donor-funded projects are likely to be secular, and to reflect the values underlying international declarations on water.

Religious values

Water has multifaceted meanings and values in different religions and cultures. Although a complete treatment of the meanings attached to water in any one religion is beyond the scope of this paper, let alone a comparative analysis of different religions. In this section we examine some of the cross-cutting themes related to water in Hindu, Judeo-Christian, and Islamic religious traditions. These are important because religious law and norms often have quite a bit to say about water, and these rules and the underlying values have a profound effect on human behaviour which cannot be understood with reference to secular values or bodies of law alone.

Water is often associated with the creation of the universe. Manu for example, describing the origin of the universe, wrote 'He [The Self-Existent Lord] thought deeply, for he wished to emit various sorts of creatures from his own body; first he emitted the waters and then he emitted his semen in them. That (semen) became a golden egg...(and) Brahma himself, the grandfather of all people, was born in the egg (Manu, I). In the Biblical creation story, 'In the beginning…the Spirit of God moved on the face of the waters' (Genesis 1), and water is mentioned three times in the first few verses. This concept instills reverence for water as an element and as the source of life itself.

Associated with the 'creative' aspect of water is a linking of water and nature. The Bible mentions water more than any other element (Miller and Miller, 1952). God's care for people is illustrated repeatedly by providing water: 'He watereth the hills from his chambers: the earth is satisfied with the fruit of thy works (Psalm 104).' Contemporary Christianity identifies caring for water resources as part of duty of stewardship of nature.

In many religions the symbolism of water as a life giving-element is associated with

its ability to remove sins and purity. In ancient times, religious rights and basic hygienic provisions were interlinked (Miller and Miller, 1952). Thus, water is required for both everyday cleansing and for rituals. For Hindus, water is a medium for purification, through sprinkling, drinking or bathing. Water has important ritual uses for example, as offerings to deities and ancestors, for purification of things and persons, and to mark changes in the status of individuals (e.g., life-cycle rituals). Bathing in sacred rivers (with the *Kumbh Mela* as an ultimate example) has special purifying properties for the soul as well as for the body. Judeaic, Christian, and Islamic tradition also stress the importance of cleaning the body with water[12] as well as use of water in many rituals. The Christian sacrament of baptism is a clear example of the link between water and spiritual purification, as well as rebirth. In these cases, the purity (symbolic, if not actual) of water is valued, and the emphasis is on water quality, rather than on quantity alone. Indeed, water from certain sources becomes holy water, and is considered so no matter what its bacteriological or chemical content.

Religions may also associate water with social relations of co-operation and conflict. Among Hindus, water symbolises social relations of hierarchy, inequality and separation between different castes. Water marks the boundary between the pure and impure castes, and within the impure castes between the touchable and untouchable castes. In the Judeo-Christian tradition, Rachel drawing water at the well for Abraham's servant (as well as his camels) establishes that she is the proper wife for Isaac (Genesis 24). The New Testament (John 4) uses a parallel story to indicate inclusiveness: at Jacob's well, Jesus breaks local taboos by asking a Samaritan adulteress to draw water for him, although most Jews would not have had dealings with such a person, though again, water is linked back to spiritual, rather than only to material life.

Despite the symbolic meaning of water in many religions, there is also a recognition that water is a basic human need. Hence many religions recognise the right to quench one's thirst as a basic human right. This is done not so much by creating a 'liberty' for individuals to take water, as by creating a 'duty' for others to supply water freely,[13] or by making the provision of water an act of merit. Islamic law and *hadiths* stress the importance of providing water to guests and extend the 'right of thirst' to animals and plants as well (Faruqui, 2001; Wescoat, 1995). In Christianity, Jesus says that on Judgment Day, giving water to those whose thirst will be one of the defining criterias for separating those who are to go to the kingdom of heaven from those who are to be cast out, because when they gave water to 'the least of these my bretheren, ye have done it unto me' (Matthew 25: King James Version). In Islam, the Prophet Muhammad also warns that those who refuse superfluous water to a thirsty traveller will be ignored by God on the day of judgement. In Hindu religious texts, one of the duties of the householder is to offer hospitality to guests, which includes the offer of water: 'He should offer a guest, as soon as he arrives, a seat,

some water, and food' (Manu, III). Offering water to quench thirst is an important religious imperative, a duty. Furthermore, offering water benefits the donor: 'A man who gives water obtains satiation' (Manu, IV). At least one reported case in the hills of Nepal suggest some Nepalese, it is believe that a person who prevent others from gaining access to drinking water, even if the source is on private land, go to hell (Upreti, 2000).

Hindu religious laws on one hand restricts free access to water for the lower castes but at the same time emphasises the virtues of offering drinking water. It is more accurate to say that Hinduism has dual values relating to drinking water; on one hand, water is a common good, to which all should have use rights for drinking purposes but not necessarily to control rights. On the other hand, the ideology of purity and pollution, hierarchy and separation, limits the use rights of the impure castes. Water is a common good for drinking purposes but the common nature of water is limited to people of similar caste status. This has serious implications for access and use rights to water, especially from taps and wells for untouchable castes. The Untouchable castes do not have access and use rights to taps and wells used by touchable castes. State law, which at least in its rhetoric proclaims equality of all citizens and the equal access to water, provides an alternative norm for the lower castes to claim equal use rights to water for drinking purposes. Research in Bhaktapur in Kathmandu valley show that caste considerations in terms of access and use rights to public taps and wells have declined significantly ('after democracy we cannot exclude the impure castes') but they are still important for the more orthodox and for ritual uses of water. All castes, whatever their ritual status, have access and use rights to rivers. Rivers, because they flow, are always ritually pure, even if they are physically filthy.

Constructing water control structures is a source of religious merit in Hindu tradition, which has contributed to the development of which water infrastructure, from tanks in south India to step wells in western India to stone water spouts *(dhungey dharo)* in Nepal. There is a long history of construction and operation of public stone water spouts, which often exploit distant water sources in the Kathmandu Valley. Most public water spouts were constructed by kings and members of the elite for religious and social prestige reasons. Construction of public taps and building to provide drinking water for the public was considered a religious deed (*kirti*) which would gain the donors and their ancestors religious merit (*punya*). Equally important was that donors gained symbolic capital (Bourdieu, 1997) by showing their generosity and religiosity. Construction of public waterspouts also expressed the welfare functions of the kingship and the state.

The case of drinking water in the Hindu tradition illustrates the important distinction between use rights and decision making rights. Low castes have the right to use water for drinking and basic needs, but high castes and elite groups have decision making rights that allow them to develop water sources and exclusion rights that enable them to keep low castes from drawing water for themselves or engaging in other acts related to water management.

Local and 'Customary' law

Local laws are often mixtures of laws from different legal orders – state, project, religious and 'customary' laws. Local laws need not be old, traditional laws. Similarly laws which are categorised as 'customary' laws may be old and traditional laws or new laws classified as 'customary' by local communities or by state law (F. and K. von Benda-Beckmann and Spiertz, 1997). It is often difficult at the local level to strictly differentiate among local, customary and religious laws. Over time, what was once considered state, project, or religious law may become customary law or local law. A change in law from one type to another reflects changes in the meanings and values of water as well as in the values underlying the law.

Water has multifaceted meanings in most communities. Wilkinson (1990, cited in Berry, 1998) enumerates the following range of local values for water: a source of sustenance, an instrument of agriculture, a means of transportation, an industrial commodity, fuel for urban development, a community good, a clean and pure resource, a source of beauty, a place for recreation, and a wildlife habitat; it is also a destructive force to be controlled. What may be somewhat surprising is that this list comes not from a developing country with limited market integration, but from the western United States. Indeed, even the Committee on the Future of Irrigation in the Face of Competing Demands (1996) appointed by the US National Research Council began its analysis by pointing out competing views of water and irrigation: it can be seen as a commodity or an input into production or as a basis for a way of life and culture.

An important point about the values of water that underlie local or customary law is that they are collective rather than primarily individual values. For many communities with irrigation, water is valued as part of the community identity, because it provides livelihood, security, and self-determination (for the group, though not necessarily for the individual) (Boelens and Davila, 1998; NNMLS, 2000). This collective value may even be raised to the sacred by incorporating it in ritual. For example, in the exchange of water in the Andean ritual of *yaku cambio*, water symbolises sacred and social resources, as well as the redistribution of communal material resources (Sikkink, 1997).

Particularly where groups have laboured together to build, operate, and maintain a water control system, the process of investing together to create property builds social capital, or the 'glue' that holds people together (Coward, 1986, 1990; Ingram and Brown, 1998). If water is individualised or transferred out of a community, it can threaten not only the authority of the management entity, but the viability of the irrigation system and even the community as a whole (Boelens and Davila, 1998; Ruf, 2000).

The relevant community underlying these local values may extend across time as well as space. The value of resources in linking past, present, and future generations has been noted particularly in native American societies.

In cultures with long histories imbedded in particular lands, the individual water user may not be regarded as the owner but as a temporary caretaker of a resource that has been handed down by past generations and should be passed along to future generations undegraded and undiminished (Ingram and Brown, 1998).

Under this conceptualisation, the alienation right to transfer water away is as foreign a notion as it is under the public trust doctrine, which maintains that the state cannot give up certain water rights that it holds in trust for the welfare of all of its citizens.

Even in communities where water is not considered common property during normal times, it may take on this meaning, in a weaker sense, during times of distress or for specific uses. In many rural areas, there are customary laws about not denying water to anyone in severe need, especially for drinking purposes but sometimes also for irrigation. During periods of drought, irrigators in Bali are allowed to borrow water when their own system flows are insufficient (Sutawan, 2000) and farmers in some villages in Nepal are allowed to 'steal' water or are given tolerated access (K.C. and Pradhan, 1997, Pradhan and Pradhan, 2000). These laws are usually inapplicable during normal times. In some localities, people allow strangers to use water for personal uses even though they do not have the right to do so, or do not have rights under one normative order. The villagers using the Kirindi Oya irrigation system in Sri Lanka give priority to pilgrims and tourists to bathe in the canal and drink from standpipes even though the project rules limit use rights to the group of local standpipe members who pay for the water (Meinzen-Dick and Bakker, 2000). Thus people who do not have use rights to water according to one local law or normative order considered relevant for normal times and for some uses may acquire limited use rights or tolerated access with reference to another local normative order or to religious law relevant for times of distress or for specific uses.

Despite the importance of local water values for the livelihoods, survival, and identity of many communities, it is important not to idealise local water law. Many scholars and international agencies, especially those which advocate the right of indigenous peoples to natural resources, often support local and customary laws, based on the assumption that these laws are in harmony with nature and that resources are shared as common property in an equitable manner based on social, cultural and religious values. In fact, many societies value control over nature. Those who live with the fluctuations of flood and drought often demand protection from what are seen as the vagaries of nature. Communities that conceptualise water as common property, in either its strong or weak sense, do not always have equitable water rights. The elite often control decision making rights and may appropriate the largest share of water as, for example, was the case in the former communal land tenure system (*kipat*) of the Limbus of East Nepal (Sodemba and Pradhan, 2000).

Many local and customary laws, at least those in South Asia, are based on the ideology of hierarchy and inequality which permeates all spheres of social relationships – caste and

ethnic relationships, gender, class, and so on. The ideology of hierarchy and inequality is maintained, as Coward observed, in the distribution of water in the Kangra region of India (Coward, 1990) as it is in Nepal (Pradhan *et al.*, 1997, 2000). This ideology makes it difficult for the less powerful and marginal groups, such as lower castes, classes and women, to establish and actualise equitable water rights; they are often termed use rights and almost always lack control and decision making rights. In Nepal, state and project laws bestow equal rights over water to all beneficiaries but it is very difficult for impure, untouchable castes to actualise their right to use water from public taps used by the upper castes because local and customary (as well as religious) laws based on the prevailing ideology of inequality and purity prohibit impure castes from touching drinking water sources used by the upper castes. Similarly, there are numerous local and customary laws pertaining to land rights, to gender division of labour, and to norms about women's participation in public activities which discriminate against women and make it difficult for them to establish use or control rights to water; it is even more difficult for them to actualise their rights, especially decision making rights (F. and K. von Benda-Beckmann, 2000).

IMPLICATIONS FOR ACTUALISING WATER RIGHTS

It is extremely important to look at the interplay among different types of law and their underlying values if we are to better understand the rights to water enjoyed by specific individuals and groups. In this section we illustrate this point with examples from a case study of domestic water supply in Bangladesh and a general analysis of women's rights to water for various purposes.

Sadeque's (2000) study of domestic water supply in Bangladesh shows the influences of all the types of law and values indicated above. International concerns with providing drinking water to improve public health are apparent in UNICEF programs which are increasing the number of hand tubewells. In contrast, national policies for water accord priority to irrigation to ensure food security. The regulations of a program to finance hand tubewells require the formation of a beneficiary group that will collect cofinancing payments and share the costs of as well as the water from the pumps. In practice, however, one household usually provides the payment. While other group members will still have use rights, local norms specify that the household that finances a well can locate it near their homestead, and is designated as the caretaker. This gives them preferential use rights, and the role of caretaker provides decision making and exclusion rights. Here, project regulations specifying a group of users, Muslim norms of not denying drinking water, and Hindu notions of caste purity and water use coexist with additional local notions that children should not draw water because they do not take proper care of the pump. Which law or regulation is used in a specific situation and for particular persons determines who will have rights, and which law

is to be used is subject to negotiation and contestation. Social, economic, power and other relationships among the claimants often determine which law is considered relevant and thus who are rights holders and the type of rights they have.

Despite implicit values of gender equity (or even preference for women) in most international declarations on water, conflicting values and norms regarding gender roles in other social fields limit women's ability to obtain or actualise rights to use and especially to control water (F. and K. von Benda-Beckmann, 2000). In recent years, some national laws and project regulations have included provisions for women to participate in a variety of user organisations, though water rights are still often assumed to be held by household heads, are used only to male.

In irrigation, rights to water are acquired by acquiring rights to land (by purchase, inheritance, gift, etc.) in the command area and, in the case of farmer-managed systems, by contributing to the construction of the system. As a categorical right anyone, irrespective of gender, may acquire water rights. But impediments to women's acquisition of land or to their ability to contribute labour mean that many women are not able to concretise their rights. Farmer-managed systems may put women at a greater disadvantage than government projects do because labour contributions are required to maintain water rights, and gender ideology prohibits women from contributing their labour for the repair and maintenance of irrigation systems where men are present. Not only local norms but also religious values of purity and pollution may create barriers. For example, Nepali women of child-bearing years cannot provide labour because their participation is considered polluting to the system hence they cannot acquire or maintain their water rights unless special provisions are made for them to hire male labourers (U. Pradhan, 1990). Government project regulations may give women a better chance of actualising their use rights because water fees, rather than labour contributions, are required. However, in both management systems, women often find it difficult to actually acquire water for their fields because they are less powerful than men irrigators. Nevertheless, in some cases women have been able to irrigate their fields without contributing labour, either through force (Zwarteveen and Neupane, 1996), personal relations (Bajracharaya, 2000; Meinzen-Dick and Zwarteveen, 1998), or through 'tolerated use' of water for recognised livelihood needs.

Even when they are able to use the water (by virtue of being a member of a household with a land right or having an independent title to land), women often cannot concretise decision making rights because of the gender ideology that women should not participate in the public domain. Here donor pressures, national policies, and project regulations are often making special provisions for women to be members of water users' associations and even to sit on the management committees of these associations. Women's participation in these forums is not just a matter of rhetoric – it has major implications for their decision making

rights. However, even when formal membership rules do not create a barrier for women, practical considerations (such as the time to attend meetings) and the relative values placed on men versus women speaking in public mean that they are not able to actualise their decision making rights. At the same time, it needs to be pointed out that though women may lack decision making power, they may be able to influence decisions through personal relations (Meinzen-Dick and Zwarteveen, 1998).

Women's rights to water vary across uses and property and management regimes. Women usually have weak rights to use irrigation water and almost non-existent rights to make decisions in farmer-managed systems because irrigation is considered a male domain. In irrigation systems managed by state agency or constructed or rehabilitated by state or donor aid, women may have better use rights and even decision making rights, at least in categorical terms. Women usually have stronger use rights to drinking water. This is partly because fetching water is considered a woman's task, and thus it does not violate local norms. Many drinking water programmes have made specific provisions for including women in organisations and as caretakers of pumps or local infrastructure, in part because of donor pressures to include women, and in part because women are felt to have the greatest stake in the facilities and thus be the most diligent managers.

Though state and project laws regarding women's rights to use and make decisions regarding water may not be accepted and considered legitimate by men (and often by women too), these laws provide a forum and a source of alternate legitimacy that women can call upon to press their claims, especially during disputes (Meinzen-Dick *et al*., 1997). Furthermore, such regulations may, over a period of time, be accepted by specific local communities and become part of their local law as for example, in community forestry in Nepal, where women have managed to establish relatively strong use and decision making rights.

CONCLUSION

Human uses of water increased almost exponentially in the latter half of the 20th century. The results have included a growing scarcity of water for many human needs and the destruction of many aquatic-based ecosystems. The ensuing debate about priorities for water use and management has been polarised, to some extent, between those who stress the value of water as a source of human welfare and those who argue that it should be treated as an economic good, with a third group pushing for awarding priority to water for nature. Yet this debate misses the multifaceted values and meanings of water, which vary across cultures, different types of law, different water uses, and over time. Ingram and Brown (1998) argue:

> As the relative scarcity of water increases throughout the world and the commodity perspective it engenders rises in policy popularity, it becomes important to revisit the community value dimension of water lest it be crushed in a policy rush to resolve scarcity problems by treating water not only as an economic good but as strictly a commodity devoid of other values.

In recent years considerable attention has been placed on ecological economics as a means of quantifying environmental values in order to include them in economic analysis, and even some allowance for distributional issues in economic approaches to water, e.g. through targeted subsidies for the poor, to meet what are considered basic human needs. But other values of water have been largely overlooked, and it may not be possible to include them in conventional economic approaches. For example, how should the destruction of a community and heritage be valued, or how can the sacred value of water be quantified? There are, as yet, no methodologies for spiritual economics. Indeed, it is somewhat ironic that when water becomes most scarce and valuable for life itself, it becomes too precious to price.

Nor are the values and meanings of water simply an academic issue, because values are reflected in various legal frameworks. Variants of state, project, religious, and customary law demonstrate many different values, and those values vary between different uses, especially drinking water versus productive uses. The rights to water for different uses and users derive from these different types of law, and hence the values they embody determine how water will be used and with what consequences for human welfare and natural ecosystems.

Rather than seeking to reconcile all these values or to establish the dominance of a single type of law for defining water rights, we argue that the many types of rights, laws, and values that shape human behaviour must receive attention. A wider focus can lead to the more effective implementation of water-related projects, through more realistic expectations of what can and cannot be accomplished through statutory legal reforms or project regulations. Recognising other values of water can also lead to better stewardship of water resources. Economic incentives alone will not be enough to get people to conserve water, share it equitably, and protect its quantity and quality for other species and future generations, but religious and community norms can contribute to such behaviour (Faruqui, Biswas and Bino, 2001).

Finally, the interaction of many types of rights, laws, and values can provide leverage to empower marginalised groups, such as women or poor households, and enable them to acquire water rights. It is important to consider not only water uses but also bundles of rights, including control and decision making rights. The discussion of human rights to water is usually limited to use rights, primarily for domestic purposes, whereas it is decision making rights that are at the core of governance issues. Questions about who controls and

manages water and makes and implements decisions related to water about the level at which rights are exercised, and about the extent to which women and marginal groups are included affect the equity and sustainability of water use.

NOTES

1 For a discussion of social field, see Moore (1973).

2 For a discussion of legal pluralism see, Griffiths (1986), Merry (1988), F. and K. von Benda-Beckmann and Spiertz (1996, 1997); Spiertz (2000).

3 The freedom to choose from among different forums or laws is limited by various factors (see K. von Benda-Beckmann, 1984).

4 There are many kinds of customary laws, only some of which are based on long historical tradition (see F. and K. von Benda-Beckmann and Spiertz, 1997).

5 Bruns and Meinzen-Dick (2000) identify three approaches to water rights studies: legal (state law), institutional (as in irrigation studies and many ethnographic studies), and common property. See also Pradhan and Brewer (1998), Meinzen-Dick and Jackson (1997).

6 Each of these rights is constituted by a complex or bundle of rights. For example, there are different kinds of use rights: full and independent use rights, dependent use rights, rights for a particular season or crop, and so on.

7 Historical studies of water in Nepal are still very sparse and more is known of certain periods than others. FREEDEAL is currently engaged in a historical study of water management in Nepal focusing on the Kathmandu Valley from the beginning of documented history. For a brief history of the more recent period, see Gyawali (1989), U. Pradhan (1990) and R. Pradhan (2000a).

8 For a list of water related laws, see Khadka (1997).

9 See R. Pradhan (2000a), for details and further references.

10 For a detailed study of the Muluki Ain and the Nepalese caste system, see Hofer (1976).

11 Exceptions are systems that assign water rights as shares of the flow, or projects such as Sukhomajri in India or Andhi Khola in Nepal that allocate water rights to all households, including the landless, that participate in the project's development.

12 Examples include Islamic rules about washing before prayers (Faruqui, 2001), Biblical references to the washing of lepers in Jesus' time, and Jesus washing his disciples' feet.

13 Building on the work of John R. Commons, Ostrom and Ostrom (1972) point out that the inverse of one person's right, or liberty, is the duty of others to uphold that right.

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WATER, HUMAN RIGHTS AND LEGAL PLURALISM

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Thou shalt have no rights to food, water, to a safe environment.
(Shiva, 1999)

If we love the truth we must openly deny the validity of the Universal Declaration of Human Rights
(Hardin, 1968)

ABSTRACT

The human rights catalogue is becoming increasingly important not only for rights to land but also to water. Non governmental orgamisations and others increasingly discuss the right to water in terms of human rights. Such a development has obvious advantages, but it may also be problematic. This paper lays out some of the problems that might emerge and that will need to be addressed. Recent studies on rights to irrigation water in Nepal indicate that the legal situation can be characterised as pluralistic. State regulation at different levels has created normative and institutional framework that is often at odds with the traditional normative and institutional framework related to water. In addition, international organisations, e.g. those which aim to improve irrigation systems, tend to add their own set of norms and decision making processes that sometimes do not tie in either with the legal structure of the state or with customary law. The new trend towards discussing rights to water in terms of human rights may also turn out to be a new source of complexity. Referring to examples from Indonesia related to land, this paper identifies some problematic aspects of such increased complexity.

INTRODUCTION

There seems to be a growing consensus that the right to water is a fundamental human right. The human rights catalogue is becoming increasingly important not only in terms of the classical human rights that claimed freedom from the arbitrary exertion of political power, but also in terms of providing access to resources essential for people's survival. Water is special. If differs from most other resources of great importance for social and economic life, such as energy sources like oil in that it is crucial for life and has no substitute.

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As an essential it is on par with air, but it differs from air in that it is far more delimited in space and time. This makes it a unique resource, a matter of survival. To deny people water, in fact, is to sentence them to death.

The very statements above survival, however, call into question the suggestion that there is a consensus. Shiva's (1992) negative restatement of the human right to water is meant cynically, of course. She denies that under the current global system of economics and politics there could be anything like human rights. One may regard her claim as melodramatic. Her alternative for a better world, based on diversity, democracy and peace – the idea of kinship among diverse peoples, the Earth and her species – may be overly romantic and populist, and at least as optimistic as a positive statement about the human right to water. She does, however, point out political and economic laws that seriously threaten human rights. Hardin (1968) on the other hand, means what he says. Hardin emphasises that the world's resources are finite, while the demands of people (however structured) are not. He cautions against technological over-optimism, warning us that technological developments may not be able to cope with the demand. It was this point of departure – rarely discussed – which led him to develop his much debated and criticised model of the tragedy of the commons. This model has its own, somewhat dubious, implications for the structure of rights and governance has been co-opted as legitimation for quite different resource rights regimes both for a rather strongly coercive mode of state regulation as well as for a market model based on individual, freely transferable rights to resources. What Hardin definitively did not advocate was human rights to resources. On the contrary, human rights, based on some notion of equal access to resources, in his view is a romantic notion, luxury humankind cannot afford in the tension between finite resources and unlimited demands. He is willing to deny such rights even for the most intimate of human rights: the freedom to breed and for babies to breathe. Clearly, he would have made an even stronger point about access to and use of water.

It is against this background of controversy that we want to discuss the problematic relations among water, human rights and legal pluralism. As this workshop indicates, there has been a gap between the world of human rights laws, with its global horizon, and the practical issues of water allocation and management that traditionally focused much more on small-scale hydrological or socio-political spaces, mainly at the level of water users' communities or command areas. Studies taking the complexity of rights to water seriously have tended not to discuss the human rights element (Donahue and Johnston, 1998; Boelens and Davilá, 1998; Bruns and Meinzen-Dick, 2000; Pradhan and F. and K. von Benda-Beckmann, 2000). Problems of social justice and fairness in resource distribution and management have mainly been discussed in terms of 'equity' (Boelens and Davilá, 1998; Shah, 1998). And indeed, as far as the values captured by the term 'equity' and the term human rights, are concerned the difference is not a big

one.[1] But NGOs and others now increasingly discuss the right to water as if it is a human right.

This development has obvious advantages. The human rights discourse invokes a universalistic legal framework that has a high moral profile. Furthermore, the human rights mechanisms carry political weight and bring in international dimensions of protection and control. But it may also be problematic in several respects. The language of human rights to food and water often remains an expression of wishful thinking. Because of its generality, human rights language is in danger of becoming inflationary. Moreover, the technicalities of the human rights mechanism have social implications that are perhaps not yet fully understood and may not always lead to desirable outcomes. With the growing recognition of legal pluralism in the domain of water rights, water rights are already exceedingly complex and complicated. Adding human rights to water adds another layer of complexity.

In this paper we look at some of the political and social implications of looking at water and water rights from a human rights perspective. We would like to emphasise, however, that we are neither human rights lawyers nor activists. We do not see it as our task to answer the legal dogmatic questions on the contradictions that emerge. Neither do we intend to engage in the debates centred around the claimed universality of human rights versus cultural-relativist positions. What we can do however, is to take the human rights discourse seriously and raise questions about some of its social implications. Five issues deserve closer inspection: The object of the human right to water, the dynamic character of human rights, their political and legal nature, the institutional consequences of formulating a human right to water either as an individual or a collective right, and its relation to existing rights to water.

A HUMAN RIGHT TO WATER: THE OBJECT AND THE NATURE OF SUCH A RIGHT

The human right to water is generally derived from the human rights to life, including food, drinking water, health, and a clean environment (see McCaffrey, 1997, also Gleick in this volume). However, to be the object of a human right, 'water' will have to be narrowed down. The most obvious way in which human rights pertain to water concerns drinking water. The human right to drinking water stems from the human right to life: without drinking water people die. Arguably, this right does not include only drinking water but also, by extension health and sanitation. While there may be good moral and political reasons to have rights to water extend to still more uses, it is much more difficult to construct an argument for a human right to water for irrigation or hydroelectric purposes. But most water is inherently multi-functional, and its allocation and use relational. Most water resources could be used for quite different purposes. A right to drinking water thus will always be caught up with its competition with other (sectoral) water uses.

WHAT KIND OF RIGHT?

Much of the ensuring discussion depends on whether the right to water is conceptualised as a freedom right or as a protection right. The right to water as a freedom right provides the freedom from interference in people's access to water by the state and state agencies. A human right to water as a protection right means that the state has an obligation to take appropriate measures to ensure that its citizens are guaranteed the means to lead a proper life, including measures to facilitate access to clean water.[2] The protection right includes an obligation on the side of the state to take measures against persons who try to exclude others from access to drinking water. Human rights, one could argue, encompass both. Given the fluid character of water, and given the fact that it is a limited good, the obligation of the state is quite substantial.

The extent of a human right to water remains limited. It does not pertain to the use of the resource in general, or to the disposition, management, and regulation of water or to handling disputes over water. Given the fact that we are talking of the political process of weighing different uses that are all – with the exception of drinking water – only indirectly crucial to maintain life, it is hardly imaginable that such a right would grant access to the resource itself. However, the recognition of a human right to drinking water would at the very least mean that drinking water takes priority over other uses of water in the weighing of the interests at stake in the competition among sectoral uses. Such an approach is reflected in the Nepal Constitution and in the Water Resources Act of 1992, where drinking water is awarded highest priority.

A human right to drinking water also does not imply that drinking water should be obtained for free. Water should be realistically accessible. In situations of severe poverty, thus, an argument could be made that water should be provided for free.

THE DYNAMIC CHARACTER OF THE HUMAN RIGHTS MECHANISM

One has to keep in mind that the human rights mechanism is a dynamic set of instruments. The dynamism is found in the norm setting and in the institutional framework. Many human rights, individual and collective, have gone through a development process from being ensured by a general political statement without much binding force towards being more precisely defined and binding legal categories. On the way to fully developed and strict legally binding rules, a new human right goes through stages of increasingly binding instruments, accompanied by an increasingly elaborate international and national institutional framework of prevention, implementation, control, and enforcement. Some human rights are fully developed in both respects, others, among them most collective rights and certainly the collective right to water, are at a very rudimentary stage. It usually takes a long series of small steps to reach full legal and institutional protection, especially

if the issues at stake are politically and socially sensitive. This involves an institutional set-up for implementation, monitoring and control, the provision of an elaborate set of possibilities for people to voice claims, and file suits, and a sanctioning institute that refines the right over time by its interpretations.

PROPERTY RIGHTS, REDISTRIBUTION AND EXPROPRIATION

There is an additional issue, closely related to the points mentioned above, that needs discussion. If one envisages a concretisation and implementation of rights to water, there will have to be a redistribution of water among and within water use sectors as well as socio-political and eco-hydrological regions. Redistribution can be effected in different ways of, which would directly touch the existing property rights regime to water. Defining new rights of control over and use of existing resources in most cases comes into conflict with existing property rights regimes over water, be they rights defined by the state or by other normative systems. The reallocation of water required to conform to human rights to water demands, will infringe upon the existing property rights regime to water.[3] This raises questions. What are the relations of human rights claims to the existing property rights regime? Through which governance institutions could such changes be effected? At which scale does this have to be done?

PROPERTY RIGHTS AND LEGAL PLURALISM

Such problems have a human rights dimension by themselves. The protection of property is also a fundamental human right that is reiterated in all-important international human right documents.[4] The Treaty on Civil and Political Liberties as well as the Treaty on Economic, Social and Cultural Rights both explicitly provide for such protection. This is a freedom right: the state is not allowed to expropriate water without due reason and without proper compensation. It is clear that this right can come into conflict with the human right to drinking water. As long as the state is the owner of water, a human right to water directed against the state, is rather unproblematic, for the state can fulfil its obligation without violating the property rights of others. But other rights, such as individual ownership or appropriation rights, or communal rights to water, become problematic. Expropriation as such is of course, possible, but it raises a series of questions. Who has the right to expropriate? Are all kinds of property rights protected or only certain rights such as private law ownership? Do property rights, like ownership rights, have a 'social function' that legitimates expropriation even without compensation?

These problems are complicated by the widespread existence of legal pluralism with respect to rights to water. Recent studies on water rights to irrigation in Nepal (and in

many other countries) have shown that the situation is quite pluralistic. Many irrigation systems are governed by local sets of norms that often exist side with state regulations or with regulations introduced by agencies that have enlarged or improved a system (see the contributions in Pradhan *et al*., 1997; Pradhan *et al*., 2000, Bruns and Meinzen-Dick, 2000). State regulation at different levels has created a normative and institutional framework that is often at odds with older legitimations of rights to water and water management officials and organisations. As earlier attempts by state agencies or NGOs to change water rights and water management have shown, legal pluralism has to be taken into account as part of the context, whether one would prefer to officially recognise non-state legal mechanisms as valid or not (see F. and K von Benda-Beckmann, and Spiertz, 1997 and 1998). A regime of human rights would certainly add to this complexity. It raises difficult questions such as whose rights to water, the state's or the local communities; a human right to water would have to be directed against?

Another important question would be how the introduction of a human rights regime would work out for the claimed customary rights of local communities would human rights reinforce claims by (members of) local communities, giving them an additional resource to assert their rights over? Or would they be used as an instrument to do away with customary titles and thus replace, or at least seriously weaken, customary law? Local people then would have a nobler and perhaps stronger claim to water – but this right would only pertain to a minimal access to drinking water, at the expense of losing their fuller customary property right to water. It is difficult to speculate and generalise, but we expect that the combined pressure of state law, international law and human rights is likely to further weaken the legitimacy and significance of local legal orders.

THE PROBLEM OF SCALE

An additional complication arises from the fact that unequal distribution of water is not simply a matter of social, political and legal regulation. It is also spatially rooted in the physical environment. Where there is no water, the best rights will be of no avail. The problems related to redistribution and to the governing institutions needed for redistribution vary with the scale at which they are perceived, ranging from distribution within a village to distribution across the global space. The problem of scale, and the drawing of boundaries are complicated since political and social boundaries are not regularly congruent with ecological or hydrological boundaries. On the contrary, what in hydrological terms often represents the axis of a unit, such as an irrigation canal for an irrigation system or a river for a catchment area, is often used as a political boundary between communities or states. Thus at which scale do these problems have to be addressed, and what does this mean for the formulation of human rights?

In discussions of water management experts, there is a strong preoccupation with the local, community level. Thus, Donahue and Johnston (1998) argue for giving predominant attention to the small-scale local level. They seem to agree with the contributors to their volume who 'suggest that the point of departure must be the local ecosystem, where biological and cultural life are daily reproduced and nurtured. In the case of water, the global is also the local. The cultural conflicts surrounding water originate and are played out in local ecosystems, and the solutions can be found there as well'. Also the Editorial to *Water Nepal* (1999) points to the need to look in particular at the local context and find the solutions there.[5] There is a preference to form governance institutions at the level of hydrological units: to form associations around an irrigation system, a catchment area, or a river basin.

This is also advocated on wider geographical scale. There are voices that demand public or international legal regulation of ecological problems on eco-regional and global scales (Byers, 1991). Because of the trans-boundary character of many eco-regions, states have to give up elements of their sovereignty and transfer them to regional organisations or even organisations representing 'mankind'. International lawyers work to give the notion of 'common goods of mankind' a more binding international legal character via the formula of common interest (Brunée, 1989).

This focus on the global scale is regarded with some skepticism by many of those working to improve conditions at local levels. 'The blue planet in peril is a powerful image to highlight the vulnerability of the earth's fresh water. Such images, however, tend to homogenise the complexity of water into a unitary framework. The focus of the international community on water as a 'common human good' is indeed a welcome step. However, we see the Year 2000 initiative on water as the beginning of a more pluralistic process of continuous engagement than a monistic one prescribing unitary solutions' (Editorial, 1999).

In a way, we do not disagree with such global oriented perspectives. But there is a danger in. Too strong a focus on the micro-level as well. If may lead us to forget that water involves problems of distribution that go beyond the micro level. Some problems may be in micro-space. But in within a micro-spaces a village, an irrigation system, a catchment area, the hydrological region of an aquifer the problem of providing sufficient water may not be solvable. It may require solutions, i.e. water, from the outside. Does focusing on small scale problems bracket out human rights that can be addressed by inter-regional distribution?

COMMON POOL RESOURCES, GLOBAL COMMONS, INDIVIDUAL AND COLLECTIVE RIGHTS

The human right to water is an individual human right. The call for papers mentions that there have been voices claiming that fresh water is a common good or a common heritage

of communities or even mankind. This is based on the conviction that water is vital, not only as drinking water, but also for growing food, for a healthy environment, and for energy and industrial production. It is a biologically and economically essential good because the survival of mankind depends on the availability of fresh water. However, since fresh water is a fluid and limited resource, serious problems concerning distribution are at stake. As has been the case with a clean environment, it has been suggested that we formulate a collective right to water that is to be brought under human rights mechanisms.[6]

Basically there are two ways of defining a human right to water as a global common. Firstly, one could argue that it is the human right of every individual to participate in the fruits of global commons.[7] In this approach individuals are bearers of this right. The second approach would be to formulate it as a collective right, in which case the relevant collectivity would have to be defined. This collectivity would then itself be the bearer of a right to water, while individuals would have the right as a member of that collectivity. Parallel to the question of what the boundaries of the common good are, one would have to decide what the relevant collectivity or collectivities should be: mankind, a people, a nation-state, a village community or a catchment community?

We think that there is good reason to pay attention to the human rights aspects of the common goods debates and policies, for the formulation of such new human rights may influence the way and towards whom – institutions can be held accountable. In other words, formulating a human right to water has implications for the legal and institutional regime that is to ensure implementation. It is not unimportant which direction is chosen because the kind of measures necessary to be able to exercise and to implement such a right would be quite different. The individual trajectory would lead to an individual claim on the state to guarantee access and perhaps on the world community in case a state is unable to do so. Class action would be a legal technique to act more collectively against a state while still maintaining the individual character of the right. In the case of a collective right, legitimate representatives of the collectivity would be the ones to take action. This would multiply the already difficult problems of defining a collectivity. Problems related to the representation of indigenous peoples indicate just how challenging this is. Unless the right is granted to clearly defined and well-established social units, a totally new institutional set-up would be required. At the present stage, however, a collective right to water, similar to the right to a clean environment, is at best a collective right 'in the course of formation', i.e. it is far from being a fully protected right, but it is on its way to becoming one. A general collective human right to water is even less developed than the right to a clean environment. It needs further development in terms of creating normative precision, binding legal documents and an institutional set-up.

IMPLEMENTING ORGANISATIONS

An individual human right to water would already face considerable institutional problems of implementation but a collective right to water would raise additional questions. According to the theory of human rights, such a general collective human right to water would always be subsidiary to and could never undermine individual human rights. However, in practice it probably will make a difference whether a collectivity has its own generic right or not. The national state and the world community of states have to take proper measures to make access to the fruits of this common good possible. Implementation could take many different forms. One way would be to set up a taxation system and to use the collected taxes for services such as education, health, etc.

Both in the individual and in the collective trajectories organisations that are assigned the task to manage the common good will have to be put in place, by national governments and especially by international organisation. But they may be accountable in a different way, depending on whether they are seen as the representatives of a community that is the bearer of such a right or as the representatives of states, which have the obligation towards individuals or collectivities to guarantee their rights. The difference may in practice not be too great because the professionals working in these organisations usually have no great sensitivity for human rights issues anyway. From experience with environmental protection, we can summarise – that such organisations work on the assumption that they are the best equipped to manage these important goods because they are better technically informed than most of the individuals for whom the right is meant. They usually combine a technical approach with a moral claim about being the true protectors of the environment. For many professionals working in these kinds of organisations this hegemonic claim is sufficient reason to be less particular when it comes to protecting individuals.

HUMAN RIGHT TO WATER AS A POLITICAL INSTRUMENT

There are reasons for hope and for skepticism. Many human rights experts caution against putting too much trust in human rights. 'While the international community, as well as individual states, has an obligation to come to the assistance of those deprived individuals, it does not appear that as a practical matter human rights law presently offers much hope to the vast majority of those in grave need of access to potable water and adequate sanitation services' (McCaffrey, 1997). However, human rights are a dynamic mechanism, and may have uses as political resources even when they are not fully implemented.

Human rights are both a political and a legal instrument. As a legal instrument, human rights serve as a last remedy if every other way to implement a right has failed. As the recent constitutional claims in India show, a human right can be relatively well defined in concrete situations, and can be successfully invoked although the Indian state has been

very reluctant to implement court decisions. The advantage of formulating a right to drinking water in terms of human rights would be that a country could be held accountable internationally for not guaranteeing its citizens sufficient and sufficiently accessible clean drinking water. Whether a country like India would comply with such international pressure remains yet to be seen, however. For smaller and less powerful countries the situation would be different because they would more readily comply in the face of international pressures.

The human rights argument could also be used to reverse market logic. The 1992 Dublin Conference recognised water as an economic good and there are strong movements to make water marketable, or better, to expand trade in water on the assumption that water would be optimally allocated. The optimal allocation of economic resources must also be conceived or defined in human rights terms. For example, a distribution of fresh water would be optimal when all people have access to drinking water and when the poor have access for free.

Besides, a human right does not begin to exert an influence only when it has been fully institutionalised; it may begin to carry weight long before that state has been reached. Human rights *in statu nascendi* can and are used as political arguments to press for protection, even before there are legal instruments to enforce them. For example, international declarations, that, in contrast to treaties are legally-technically speaking not binding, have proven to carry considerable weight in international negotiations and often in fact do obtain a certain degree of obligation. Their strength has both advantages and disadvantages.[8] They provide legitimation for putting the issue on national and international agendas and for providing the necessary funds to take action against the deprivation of water. Human rights can also serve as a political instrument for individual persons protection referring to an international treaty. Citizens often start claiming before their country has even signed that treaty. Or they refer to an international declaration signed by their government that is not legally binding. Such claims carry more weight than a claim for protection that is not backed by any international human rights document.[9]

There are other ways in which the human rights mechanism throws its shadows far beyond its legal implementation within a single national state. Increasingly people make comparisons with interpretations and implementation practices in other countries and draw on experiences abroad to enforce arguments for certain interpretations within their own countries. This is done both in judicial and political fora. The Internet and other telecommunication have been conducive to such comparisons, as however information is becoming more easily accessible than it was before. The road to full protection will be long and difficult.

Another question is whether human rights to water should be pursued as individual rights or collective right. The question is whether it is worthwhile to aim for a collective

right. The reason why human rights are defined at all is to shift power relations and to give those who are in a subordinate position vis-à-vis the state and other powerful actors' arguments that carry more weight than ordinary legal and political arguments could provide. What, therefore, would be the advantages and possible disadvantages in terms of shifting power?

The question whether a focusing on human rights to water is a more promising strategy than the earlier moral and political argumentation in terms of social justice or equity remains. It has a higher moral and legal status than equity considerations, but it also narrows down the extent and the scope of the rights of deprived persons where more is at stake than the right to be provided with sufficient drinking water.

NOTES

[1] See, for instance, Shah's (1998) definition: 'Equity means fairness in creating secure access to water for all, both within and between communities and within and between regions. It also includes the just allocation of scarce water resources across sectoral users' groups. Equity involves dealing with all aspects of the externalities that the production and use of water entail, especially in conditions of groundwater overdraft, waterlogging, proneness to flooding, groundwater contamination and water pollution'.

[2] See also Singh (1992), who describes how the right to water has been treated in Indian constitutional and public law, where different water rights had both negative (freedom) and positive (protection) rights.

[3] Water rights are fundamental. Currently, irrigation accounts for over 70 per cent of water withdrawals worldwide, and even more in many developing countries. The question of how the customary rights of existing water users are acknowledged, and whether new allocation patterns are imposed or negotiated with users, will have a major bearing on rural livelihoods as well as food security' Pinstrup-Andersen (2000).

[4] It also might come into conflict with another human right, i.e. the right to self-determination.

[5] Even at the micro-level of a relatively small river system, the context of water management exhibits high physical, social, institutional and cultural variability (Editorial, 1999). Each country, indeed, each region within a country, is a specific case in which the problems need to be seen in the local context; the solution, too, must be provided from the grassroots upwards (Editorial, 1999).

[6] See Baehr and Vander Wal (1990). Authors like Donnelly (1990) hold that human rights are individual rights, though embedded in social contexts. Individual may hold individual rights both as a separate individual and as a member of a community. Such rights are held by individuals as members of protected groups, like the family. But in his view they cannot be the rights of groups. These groups have no other human rights that could infringe the human rights of their members. He considers the right to self-determination and the right to be protected

from genocide, both collective rights formally recognised in International Human Rights Covenants, a conceptual mistake. See for a discussion on the controversy about collective rights Advisory Committee on Human Rights and Foreign Policy 1995 and Advisory Council on International Affairs (1998). In this connection Burgers (1990) makes some relevant distinctions between

a) Individual rights that can be exercised by individuals (freedom of speech)
b) Individual human rights that can be *exercised* only collectively (right of assembly or association)
c) Individual rights that can be *implemented* only collectively. Here most economic and social rights that oblige authorities to take general measures which affect great numbers of the subjects of such rights collectively. Yet it would not be correct to say that such rights are *held* collectively (Burgers, 1990). This argument would, in his view, pertain to the rights to water or to a clean environment.
d) Rights *held by* collectivities, i.e. peoples, (self-determination, genocide)

[7] A rather extreme example of an individual approach has been proposed by the Dutch economist Times who pleads for ownership rights for every citizen of the world to a share of the environment. See K. von Benda-Beckmann (1998).

[8] As Nader (1996) has shown for international water disputes, stronger countries tend to obtain a larger share of water. One could be tempted to expect a mitigating effect of the human rights argument on the international distribution of water. However, this is not necessarily so. Unfortunately, human rights are selectively invoked. Human rights do not have a particular good record when it comes to the distribution of goods between unequal parties. In an international dispute between unequal neighbours, the weight of a human rights argument to water might well increase rather than decrease disproportional distribution. That is, the stronger party may press a human right to water only where it serves its interests in particular. This is in particular to be expected as long as there is not a fully developed right to water and as long as such a right lacks precision.

[9] In West Sumatra, for example citizens claimed that they could not arbitrarily be excluded from attending court procedures on the basis that would be a violation of their human rights, and judges granted these claims, despite that fact that Indonesia has not yet signed the most important human rights treaties.

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TRANSNATIONAL LED PRIVATISATION AND THE NEW REGIME FOR THE GLOBAL GOVERNANCE OF WATER

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ABSTRACT

Many aspects of the current and looming freshwater crisis can be traced to the basis on which water resource development and management is organised. In this context, it is necessary to formulate a socially just and environmentally sustainable approach to water issues. This paper, outlines four components of such an approach. First, this paper emphasises the need for recognising water as a fundamental human right and explore what is at stake in that recognition. Second, it stresses the limits and dangers of the current approach centered on privatisation of water, which assumes that water is only an economic good. As an alternative, this paper explores the potentialities of recognising that water is foremost a social good and only then an economic good. Third, it outlines areas where structural changes in patterns of water use have to come about. The two primary areas of focus are pollution and consumption. Finally it explores the global governance issues involved in this alternative strategy.

INTRODUCTION

Water today

While the amount of freshwater resources available in the world has remained broadly constant over centuries, there has been a very large increase in the water use in the last century.[1] Despite this increase, as many as 1.3 billion people – one out of five – lack access to clean drinking water, and 2.6 billion – almost 40 per cent of the world's population – lack sanitation facilities.[2] Widespread water shortages beyond those that already exist are predicted in both rich and poor countries.

This global water crisis has many aspects. Environmentally, this includes the contamination and depletion of ground and surface water, salinity increase, loss of wetlands, and loss of biodiversity.[3] Socially, it has led to diversion of water away from rural communities and farms to urban centres and industry, degraded human health, food insecurity, and political instability.

This crisis seems destined to grow worse. Today, irrigated agriculture accounts for 69 per cent of world's water resource use, while industry and domestic use accounts for 23 per cent and eight per cent respectively.[4] According to the UN, the human population will reach 7.8 billion by 2025 – a 38 per cent increase over present levels. The Food and Agriculture Organisation (FAO) has estimated that a 34 per cent increase in irrigated area will be needed to meet the projected water requirements for this growing population.[5] In a 'business as usual' scenario, such an increase in irrigated area will significantly affect water available for both ecosystem and domestic human needs.[6] It is in this context that a number of leaders of international stature – including Boutros Boutros-Ghali of Egypt, Ismail Serageldin of the World Bank, the late King Hussein of Jordan among others – have warned that sooner or later wars may break out between nations as a result of conflicts over water.[7]

In keeping with the market oriented approach that is dominant globally, international financial groups have aggressively promoted privatisation of water services as a solution to the crisis since the early 1990s. From 1988 to 1995, the pace of privatisation was not very fast: in a seven year period private utilities serviced less than 100 million people all over the world.[8] According to estimates by Vivendi, one of the largest water companies in the world, the share of the private sector in water services is still minimal: even in the largest market, the United States, the share of private companies was Five per cent in 1995, while in Asia it was only One per cent as recently as 1999.[9] However, the pace of privatisation has steadily been increasing in the last 5 years, and while much of the focus of privatisation is in the area of water supply and sanitation services, other areas are being opened up.[10]

This paper provides a critical examination of the trend towards privatisation, and tries to contribute to the development of an alternative vision. The first section surveys the broad developments that have led to the current water crisis; the second tries to identify the major institutional actors involved in promoting transnational privatisation of water services. Through a focus on the crucial role played by regulatory mechanisms, the third section explores why privatisation is not, in the case of water, an adequate response to the crisis. The fourth section provides an overview of the institutional sites from where a perspective critical of transnational privatisation has sometimes been articulated. The fifth section outlines an alternative human rights framework from within which to think of water; the final section explores the practical steps that would be necessary to make this framework a reality.

Water Resources Development and the 'tragedy of commons'

The changes in water use that have occurred in the last century are sometimes viewed as simply the result of population explosion, increase in irrigation, and improved standards of living.[11] Such accounts, however, fail to focus on social and political processes, and

presume that phenomena such as population explosion or irrigated agriculture necessarily lead to water shortages. Most of the problems can be traced to the assumptions that organise water resource development and management practices. This section briefly outlines the three major dimensions of the social and political processes that are most directly relevant to an understanding of the strengths and weaknesses of the current mainstream response to the freshwater crisis.

The last hundred years have been marked by dramatic shifts in patterns of water management. First, there was the development of a hydraulic mission, and an accompanying displacement of community based organisations.[12] Increasingly, water resources management has sought to meet modern societies' growing needs in water supply and power – for industry, irrigation, and domestic use.[13] This was done primarily through large engineering projects like hydroelectric dams and groundwater extraction. This development peaked around the 1960s in the developed world, by which time a technocratic water administration system was in place. This 'hydraulic mission' continues even today, especially in the South, where many countries have not yet developed a comparable infrastructure.[14]

Second, accompanying this shift towards intensive water extraction has been an emphasis on extremely intensive/extensive water use – not only in irrigated agriculture, but also in industry and homes. While increasing population is an important factor, it would be wrong to assume that the water crisis is caused primarily by overpopulation. According to Maude Barlow, author of *Blue Gold: the global water crisis and the commodification of the Worlds Water Supply*, 85 percent of the world's water is used by only 12 per cent of its population, and most of this population is based in the developed world.[15] In the South, the bulk of the population is not covered by the centralised water supply systems which encourage the most intensive domestic water consumption. And even the centralised water supply systems often do not provide large amounts of water, especially to the domestic sector. Thus, it is in the North, where the hydraulic mission has been most successful, that the bulk of water consumption takes place.[16]

Third, in most parts of the world these centralised water development projects were managed by the public sector. Water supply was perceived as the State's responsibility by all concerned and was provided at highly subsidised rates.[17] Thus, there are water policies (still in place in most countries), which encourage unlimited consumption, focus on a supply oriented rather than demand management approach, privilege luxury needs over basic needs, externalise the environmental costs of production, and do not punish polluters.[18] To make matters worse, by the 1970s, state investment in the infrastructure did not increase in proportion to the demand. This resulted in a situation where state-run water management programmes deteriorated in many countries. Also, there were no easy answers to questions of efficiency, equity and sustainability, or of how to finance the ever-expanding need for infrastructure development and maintenance.

The dominant international response to this situation was analogous to the response to the so-called tragedy of the commons. Briefly put, those who perceived such a tragedy argued that goods shared in common – to which state-managed resources were implicitly compared – were likely to suffer from ecological degradation. Experiences of water scarcity, water related fights, appropriation as well as wasteful use of water resources, lack of finances for the effective management of water resources – all were ascribed to public management of water resources.

It is in this context that privatisation was increasingly claimed to be the best solution. Proponents of privatisation support it not only on the grounds that it will be more efficient, some of them also claim that it will ensure better water availability to the poor. They usually cite two major reasons in support of the latter argument. First, they point out that the public sector cannot finance water projects, and therefore private-public partnerships are needed to raise the necessary finances. Second, they argue that the public sector wastes as much as 40-50 per cent of the water, and this can be reduced by privatisation, (since private companies are more efficient).

The push towards privatisation has been helped by the influence of the well-organised private water service sector, increasingly dominated by a handful of transnational corporations and their subsidiaries. Four of the top ten water companies are ranked among the 100 largest corporations in the world.[19] Most of them are either British or French transnational corporations, the two countries where water has been privatised for some time.[20] All these corporations are vying for the control of the global water market, estimated to be worth $ 800 billion.[21] They have also been systematically cultivating relations with influential governments like the United States, or with international institutions like the IMF and World Bank, helping the formation of international water policy organisations that are sympathetic to their concerns.[22]

INSTITUTIONAL BASIS OF THE TREND TOWARDS PRIVATISATION

The trend towards privatisation has been very much strengthened by the support of two key sets of institutions in the international financial order – those around the WTO and Bretton Woods. [23]

WTO, GATS and water services

Globalisation and economic liberalisation, involving the increased movement of capital across borders has been facilitated and accompanied by the development of bilateral and multilateral trade agreements and establishment of new intergovernmental institutions such as the World Trade Organisation. Indeed, the General Agreement on Trade in Services (GATS) under the World Trade Organisation (WTO), still under renegotiation – and

potentially open to being influenced by the interventions of various actors, including NGOs – will be of crucial importance in deciding the future of water services.[24]

The WTO was the outcome of the Uruguay Round of trade negotiations concluded in 1994. That round strengthened the scope of General Agreements on Tariffs and Trade (GATT) of 1947. It also led to 15 trade agreements, including the GATS. The WTO was established to oversee these agreements. Today, with the inclusion of China and Taiwan, 144 countries are members of WTO. The WTO, an intergovernmental organisation, has the power to make and enforce free trade agreements and to impose trade sanctions on member countries caught breaking them. WTO rules will curtail the national space available to legislate any national laws enacted in the interest of ecological sustainability, equity concerns or national food security issues.[25]

True, the WTO allows members to apply higher levels of protection for legitimate objectives such as health, safety and environmental protection. But this is on condition that technical regulations are no more restrictive than necessary to meet those objectives; However, it is often very difficult to meet these conditions. In fact, as many critics have pointed out, the WTO tends to view trade in isolation from its environmental and social impacts.[26]

Of the WTO agreements, water resources are likely to be most directly affected as a result of GATS, of which every WTO signatory-country is part.[27] When public services are brought under GATS, they are deregulated and subject to the legally enforceable obligations imposed by WTO rules. Thus, market access commitments under GATS could hinder attempts by developing countries to keep out transnationals in the interests of marginal groups or the environment.

Two aspects of GATS in particular are noteworthy. First, there is its inclusiveness and irreversibility. The US pushed very hard to have services included in the Uruguay Round negotiations, but did not succeed in requiring the inclusion of all services. Countries were unwilling to accept privatisation of all their public services and would only agree to GATS if they could choose which services to include in the agreement. As a compromise, countries can currently choose which services they wish to have included under GATS.[28] But even this choice may be less real than it appears – the obscure Article 6.4 of the text 'implies that all service sector regulations can be contested across the board'. Furthermore, the agreement requires that once countries accept the GATS agreement, they cannot back out of their commitments.

Second, while it 'incorporates a provision (Article 14.b) that is intended to provide an exception to its rules if required for environmental protection or health purposes… these exceptions are very narrow. For example, they only address environmental protection when life or health is at risk, but not when a non-living natural resource is endangered. This would mean that measures to address wetland erosion or fresh water quality would

not fall within the GATS exception, and so would be illegal and therefore open to challenge under WTO rules'.[29] This environmental exception has so far been interpreted in a narrow way by the WTO, which has allowed only 'necessary' exceptions, and has rejected more cautious environmental approaches. Thus, rather than adopting 'reasonable laws', governments must chose the 'regulatory measure that will have the least impact on the companies'.[30]

In many regards, GATS is very similar to the 'failed' Multinational Agreement on Investment (MAI). Both are basically attempts to ensure that opportunities are made available to transnational corporations to invest in domestic service delivery sectors. The clause on non-discriminatory treatment ensures that corporations have rights without responsibilities. This includes, for example, the right of a US corporation to set up operations abroad and be immune from US laws. As the North American experience suggests, trade agreements may create an environment where sovereign national governments lose control of water in their jurisdiction.[31]

Water itself is defined as a commodity under GATT.[32] The GATT definition of a 'good' lists 'waters, including natural or artificial waters and aerated waters' as a good and adds in an explanatory note that 'ordinary natural water of all kinds, other than sea water' is included. The operation of water pipelines, ships etc. to supply bulk water, municipal systems for sewer and water supply are all services that could be included under GATS. If these water services are included in GATS and the provision is to be applied in various countries, the water crisis will be aggravated, especially in the developing countries, where privatisation is likely to be poorly regulated. It would also be difficult to regulate/direct the activities of these transnational corporations to ensure environmental sustainability. Likewise, if water services are brought under GATS, this would eliminate the possibility of ensuring efficient and equitable access.

The manner in which water services will be brought under GATS is still the subject of debate. At the November 2001 WTO Ministerial Meeting at Doha, a group of developed countries, led by the EU and US, proposed that water services be brought under GATS as part of environmental services.[33] This may have partially been in response to the criticisms from some developing countries and advocacy groups that water services should never be part of GATS. By claiming instead to provide an environmental service (of treating and disposing of polluted sewage and industrial water), part of this criticism may seem to be addressed. Yet, technically, such disposal is always combined with the provision of water services, which is also usually the most profitable sector of these services. Therefore, by focusing on environmental aspects and disposal issues the earlier agenda of privatising water services is being promoted under a new guise.

The World Bank, IMF and loan conditionalities

The Bretton Woods institutions, especially the IMF and World Bank have been quite influential in these developments. They have been calling for opening up of national economies for international investments and trade, and privatisation of many public sector undertakings for economic development and efficiency improvements. Of late, this has included a call for privatisation of water projects including public water services.

A recent review of IMF policies in forty countries found that during 2000, IMF loan agreements in 12 countries included conditions imposing water privatisation or full cost recovery for public provision of the service. When the IMF presses for privatisation of water it is difficult for countries to refuse, especially if they are dependent on IMF loans, as many in the South are. Also, compliance with IMF conditionalities is a pre-requisite usually for access to other international creditors and investors, including the World Bank.[34]

The World Bank too has been actively involved in water privatisation. In Bolivia, at the insistence of the World Bank, the local administration privatised the water supply of Cocahamba, allowing the transnational water company Bechtel to run the project.[35] World Bank backed policies have set the stage for water privatisation in several other countries as well.[36]

THE IMPLICATIONS OF POORLY REGULATED PRIVATISATION

There can be little doubt that the older model of providing water services through centralised public sector institutions is seriously flawed and unsustainable. Nevertheless, the trend towards transnational-led privatisation worsens existing problems rather than solving or reducing them. by economic commission for Laten America and Carrebean, while recognising the possible strengths of privatisation in some contexts, has sounded a particularly serious note of caution about water privatisation. ‘Overall, an inconclusive, albeit growing, body of evidence suggest that privatisation of industries operating in competitive markets free from substantial market failures leads on the whole to significant efficiency gains’. But water services, it went on to argue, presented a different situation, for it was a classic case of a natural monopoly.

A natural monopoly is an industry where, by virtue of its inherent technical characteristics, total costs of production are lower when a single service provider produces the entire industry output than any collection of two or more service providers dividing the total among themselves, thus making entry unprofitable and making it efficient for there to be a single service provider within a given geographical area. The water industry is perhaps the most monopolistic of all public utility services …. Direct market competition in the provision of water supply and sewerage services would entail inefficient, wasteful, and prohibitively costly duplication of the network of water mains and sewers.

Private ownership, the study pointed out, does not make the natural monopoly problem go away. Simply converting a publicly owned monopoly into a privately owned one provides few, if any, incentives to reduce costs. 'A free market will fail to provide an economically efficient outcome when a natural monopoly exists, because there will be no competition to regulate the behaviour of the monopoly in the interest of society.' Therefore, it said, the options available to governments regarding natural monopolies were two: public ownership, as has traditionally been the case in most countries, or the regulation of privately owned monopolies. 'The purpose of regulation is to replicate the results that the competitive market system would achieve in the way of allocative and productive efficiency'.[37]

This question of the regulation of monopolies provides a particularly effective lens through which to view the transnational takeover of water services. Proponents of privatisation who see it as a panacea assume that the principal problem is caused by state ownership of water resources and services. But in view of the fact that water is a natural monopoly, privatisation, if poorly regulated, is not an effective solution even to economic and managerial inefficiency often associated with state ownership. And in the absence of proper regulation, transnational private sector institutions are likely to be even more environmentally damaging and insensitive to the concerns of marginal groups than the public sector monopolies that they replace.

Thus, there is, first, considerable evidence indicating that privatised water services are no more efficient than the pubic-sector controlled ones that they replace. Privatisation has resulted in shoddy maintenance of the infrastructure (as has been happening over the last decade in the UK, where the regulating authority has very limited powers), deterioration of quality of water supplied (as in the case of Tucuman, Argentina, 'where water tariffs doubled and water supplied turned brown')[38] or in substantial increase in water price (Bolivia).[39] Since the privatisation of water services in Britain during the Thatcher government, prices skyrocketed by up to 450 per cent, averaging an increase of 67 per cent. Thousands of people, unable to pay their bill, had their water service cut.

Second, privatisation, which often focuses on full cost recovery, has been especially adverse in its effects on the most marginal sections of society, and on the ecosystem – both of which cannot pay for water. (Here I do not raise the point that access to water is essential to life and that one should be discussing the issue of entitlement rather than that of purchasing power.) The result is that basic life and ecological demands on water are likely to be ignored in a privatised regime unless it makes business sense to support these services.[40] Where regulatory mechanisms are not operational, water will be collected/extracted from the cheapest source, even if the ecosystem is threatened. Such environmental degradation also directly affects the livelihoods of the (predominantly marginal) people who depend most upon the ecosystem.

Also, the practice of full cost recovery charges much more than what marginal groups can afford to pay in cash. This can result in communities resorting to other less reliable and safe means of getting water – some times even resulting in deaths.[41] In Cochabamba, for instance, a third of the population did not have any significant access to water resources; An attempt at privatisation in early 2000, worsened the situation as the water prices went up manifold. Even many of those who earlier had access, could no longer afford to pay for water. Civic protest eventually resulted in throwing the multinational out, but this was at the cost of many injuries and the death of one person. Even the 'efficiency' of the transnational corporations is likely to be at the cost of the poor. Consider the issue of 'waste'. While there is little doubt that public sector provision of water encouraged wasteful use, it is not clear that privatisation is addressing the right kind of wasteful use. The most serious forms of wasteful use – those associated with excessive consumption – remain entirely unaddressed. Much of what the transnational private sector seeks to eliminate as 'waste' is part of the quasi-legal appropriation of water resources by marginal groups. Here, to eliminate 'waste' would effectively marginalise these groups even more.

Third, privatisation under poorly regulated institutional systems has reduced the control of the public, and of civil society organisations, over water resources. In these situations, a monopoly transnational corporation will be accountable neither to their customers, nor to the civil society organisations of the country where the business operations take place, let alone those who are not their customers due to lack of purchasing power. Essentially, such a scenario implies that the public loses much of the control they may have had before privatisation (in terms of holding the public servants accountable for the implications of their actions). Such has been the case in Britain.[42]

Fourth, countries have often had to make compromises in accepting transnational privatisation. Often when a public sector undertaking is privatised, the private corporation acquires existing infrastructure facilities for a throwaway price from the public sector (as happened when British water services were privatised in the late 1980s). In case of water sector investments, governments often enter into agreements with the transnational companies (at the behest of the international monetary organisations like World Bank), guaranteeing them a certain percentage as return on investment, whether the enterprise is profitably run or not. This obligation is often met by the nation states by cutting the budget allocated for essential public sector spending.[43]

Thus, poorly regulated privatisation reduces the control over water resources not only of the traditionally marginalised groups, but even of the mainstream civil society groups and of the state. And a range of experiences indicate that transnational-led privatisation will be less amenable and susceptible to regulation. Even in the North, there is evidence to show that transnationals and private companies have often successfully subverted regulatory systems and rendered them ineffective. And relatively weak governments in

the South will be much more vulnerable to pressure from the Northern governments, trade sanctions, and to Bretton Woods institutions which generally tend to support these transnationals.

Transnational-led privatisation need not even be the most effective means of financing. It is not clear how much of the investment in these projects comes from the private companies, and how much from other sources including the countries of operations/ international financial institutions. Also, the money that the private companies raise on the market is often on the basis of guarantees from these organisations. If such guarantees were to be provided to groups outside the transnational private sector, they too might be able to raise similar amounts.

Furthermore, as the first section of the paper indicated, the inefficient and centralised water distribution systems under state ownership is only one of the three major dimensions of the current freshwater crisis. The other two dimensions are the hydraulic mission, which has caused erosion of community based water management, and patterns of intensive use. And privatisation aggravates these two other dimensions of the freshwater crisis. For example, transnational companies are likely to have little or no interest in reducing intensive use through regulatory mechanisms or low cost technologies. Their interest will rather be in supplying high cost water saving/purification technologies, not in addressing the issues related to over consumption and intensive use of water. The problem with poorly regulated privatisation, thus, is not that it abandons the old style of water management which has contributed to the current crisis; it is rather that it often reproduces and aggravates the worst features of that style.

INTERNATIONAL RESPONSES TO WATER CRISIS

Many international institutions and fora have recognised the complexity of the current water crisis, and have tried to evolve a more nuanced response to it rather than responding with a simplistic emphasis on transnational-led privatisation. Three sets of organisations have been particularly important in this process: the UN organisations, the new water councils and partnerships, and international NGOs.

UN Organisations: Rio Conference and the aftermath

Right from the time of the UN Conference on Human Environment (Stockholm, 1972), the looming crisis in freshwater availability was recognised as a problem of international dimensions. It was an awareness of this crisis that led to the launch of International Drinking Water Supply and Sanitation Decade, at the UN Water Conference (Mar del Plata, 1977), and to the UN General Assembly Proclamation of the decade 1981-1991 as the 'International Drinking Water Supply and Sanitation Decade'. The focus of such efforts

was not holistic, and they failed to recognise that the problem was often caused by the very same intensive water use patterns that state policies encouraged in other contexts.[44] They often entirely failed to solve the drinking water problem.

But from the mid-eighties, it was felt that state intervention was not an adequate response to the crisis, and that while the lack of water for domestic use was its most serious and immediate aspect, the freshwater crisis was also much larger than that alone. The most influential effort to address these broader ramifications was the 'UN Conference on Environment and Development', which resulted in Agenda 21, a document that dealt specifically with Earth's future (Earth Summit,1992).

Calling for an integrated approach, Agenda 21 devoted an entire chapter (chapter 18) to freshwater resources, in addition to referring to them in other contexts.

Integrated water resources management is based on the perception of water as an integral part of the ecosystem, a natural resource and a social and economic good, whose quantity and quality determine the nature of its utilisation. To this end, water resources have to be protected, taking into account the function of aquatic ecosystems and the perenniality of the resource, in order to satisfy and reconciles needs for water in human activities. In developing and using water resources, priority has to be given to the satisfaction of basic needs and the safeguarding of ecosystems. Beyond these requirements, however, water users should be charged appropriately.[45]

In the context of the initiatives around the same time to privatise water, this insistence at the conference (often referred to as the Earth Summit or the 'Rio Conference') on the priority of basic needs and ecosystem requirements, represented a cautious approach. Many of the other follow-up actions after the conference shared this caution, and focused directly on the issue of sustainability.[46]

One consequence of the summit was the creation of the UN Commission on Sustainable Development or UNCSD. The Earth Summit was one of the first international fora where there was a tremendous participation from both southern and northern non-government organisations. They pushed governments to create an institutional follow-up mechanism. Thus, the (UNCSD) was set up in 1992, in order to monitor the implementation of Agenda 21 and to ensure an effective follow- up of the Rio conference.[47] The Earth Summit had also emphasised the need for space for active and effective participation of non-governmental organiations, the scientific community and the private sector as well as local groups and communities.[48] Partially because of this, a UNCSD NGO steering committee was created in 1994.[49]

In another follow up to the summit, the UNCSD commissioned a study in 1994 on 'Comprehensive assessment of the fresh water resources of the world'. The report was prepared by Stockholm Environment Institute along with representatives for UN/DPCSD, UN/DDSMS, UNESCO, UNEP, UNDP, UNIDO, WMO, WHO, FAO, and the World Bank. The

preparation process recognised the 'need for a partnership of all stakeholders' for water resource stewardship.[50] These processes of debate over water policy contributed to the creation of new international forums for discussing and acting upon the water crisis.

World water council, global water partnership

Two international forums have been particularly important – the World Water Council (WWC) and the Global Water Partnership (GWP) – and have played complementary roles in the international debate over water policy. The one big difference between the two is that, while the WWC, an independent NGO, registered in France, presents itself as a independent think-tank on water issues for all those individuals and professional associations and organisations concerned with water policy issues, GWP is conceived as an apex body of an international federation of regional water partnership.[51]

These two institutions have provided forums where a range of interests have been represented – from the transnational corporations on the one end of the spectrum to a few civil society organisations on the other end, along with bilateral aid organisations, international financing organisations, national level water organisations, independent professionals, development oriented non-governmental organisations etc. falling in between. However the decision-making is mostly influenced by two of these groups: international financing organisers like the World Bank and IMF and transnational water corporations.

The WWC, set up in 1996 took a lead role in organising the first (1997) and second (2000) World Water Forums. In 1997, it launched the World Water Vision process at the First World Water Forum in Marrakesh, and convened the 'World Commission on Water in the 21st century' to develop a vision for water.

The GWP secretariat too was set up in 1996 (See footnote 55) and was entrusted with a mandate to develop the framework for action through regional consultations, a parallel process to the development of 'World Water Vision'.[52]

The Vision document (developed by the commission) and the 'Framework for Action' developed by GWP, were presented at Second World Water Forum (The Hague, 2000).[53]

The 'Ministerial Declaration of the Hague on Water Security in the 21st Century', made by 158 delegations, representing 130 countries (including 114 ministers), as well as heads of many international organisations at the 2nd World Water Forum, drew heavily on these documents.[54] It stated that the main challenges facing us were meeting basic needs, securing food supply, protecting ecosystems, sharing water resources, managing water related risks, valuing water, and governing water wisely. While recognising that governments play a pivotal role in meeting these challenges, it also stressed the need for institutional, technological, and financial innovations in order to move beyond the 'Business as usual scenario'. It recognised that the involvement of all stakeholders was required to meet these challenges on the basis of an integrated approach to land and water resources management.

Yet it was in many ways a step backward from the Rio Declaration. Unlike the latter, for example, it did not stress that water should be made available free of cost to meet basic human needs and for safeguarding the ecosystem. Also these groups/ processes are not integrated in the United Nations processes on water such as the Commission for Sustainable Development.[55] While the forum recognised that access to water was a basic human need (*which can be provided as a service*) the forum refused to recognise water as a human right (*which has to be ensured by humanity/nation-states*)

NGOs: questioning privatisation

Southern and northern NGOs have been playing a critical role, not only emphasising the need to revive traditional water management systems and develop low-cost systems, but also raising pertinent questions about inequitable and unsustainable water resource development, and transnational-led privatisation initiatives. At the second World Water Forum, some of them came out with a 'NGO Major Groups Statement to the Ministerial Conference'. Their statement questioned not only the Ministerial Declaration, but also the mandate of the World Water Commission, and the World Water Council Vision Document. It expressed serious concerns about the process and contents of the framework of action.[56]

After the Earth Summit, the Second World Water Forum was one of the first international fora where these groups expressed a collective opinion in an effort to influence the official statement on water. In the formulation of the Vision document and framework of action, there had been considerable consultation with national and regional organisations – especially in the South. Nevertheless, critics felt that these documents still did not reflect the views of consumer organisations, trade organisations or civil society in general.[57] They felt that in the 'World Water Vision' and 'Framework for Action' exercises effective participants were a group – including World Bank and the Suez-Lyonnaise des Eaux, the second largest global water corporation, amongst others – closely associated with each other; [58] that while some NGOs where consulted, citizens interests were effectively excluded. The NGO Major Group Statement to the Ministerial Conference called for more transparency in the work of Global Water Partnership and World Water Council. Also, some of the advocacy groups felt that the Vision document had not engaged concretely with the dangers presented by the new initiatives coming from the WTO and Bretton Woods organisations.

Specifically, some felt that 'NGOs working in fresh water needed to strengthen their capacity to respond to international, regional and national policy formulation and implementation. International policy making, around fresh water issues is dominated by multilateral donors, especially the World Bank and professional research institutions. NGOs have amassed a great deal of experience in water and governance issues under different political, economic, cultural and environmental circumstances and have a diverse range of

valuable contributions to make to policy development. Yet there has been no concerted effort to co-ordinate advocacy efforts or to integrate NGOs across the sectors (i.e. water supply and sanitation, environment, food security, dams etc.)'.[59] Out of this recognition came the establishment of Freshwater Action Network (FAN), an initiative by UNED forum, a British NGO. It aims to increase NGO participation in policy-making around freshwater issues through multi-stakeholder dialogues involving all interested groups. Blue Planet Project, an initiative by Council of Canadians, (a Canadian, national level advocacy organisation) around freshwater advocacy was an immediate outcome of the second world water forum.[60]

Another initiative, though not as directly relevant, has been the creation of Citizen's Compact, in response to the call by UN Secretary General Kofi Annan, for a 'Global Compact' between the UN and the business community.[61] The 'Citizens Compact' observes that 'citizens' organisations and movements recognise that the public sector has enormous influence on human health, environment, development and human rights'. Nevertheless, it points out, the goals of the private sector and the United Nations are different, and `at times, corporations work at cross purposes to the wider realisation of rights and responsibilities enshrined in United Nations covenants, declarations and agreements'. As an implicit corollary to Annan's proposed compact with the business community, it proposed a 'compact between UN and civil society, regarding UN's relationship with the private sector.' The proposed compact tries to ensure that UN principles are not compromised in the UN's dealings with the transnational private sector.[62]

The most important citizens initiative with reference to the global water crisis, has been the 'Global Committee for the Water Contract'. This is a group initiative by 'citizens concerned by the fact that 1.4 billion of the planet's 5.8 billion inhabitants do not have access to clean drinking water, the fundamental source of life'. The Group came together in 1998 and is constituted of people from Africa, Asia. Europe, Latin America and North America.[63] The 'Global Contract' identifies the establishment of a 'World Water Treaty', legalising water as a vital trust and common good for all humanity as a priority. According to their manifesto, this 'treaty should exclude water from all international commercial conventions (such as those existing within the framework of the World Trade Organisation) as is already for the cultural domain' (emphasis added). National groups are now active in a number of countries, including Belgium, Canada, and USA.

While Blue Planet Project and Global Water Partnership are global networks with their origins in the North, national alliances against water privatisation are being formed in the South that share a number of platforms with these groups. Well known examples of the groups from South are The Coalition in Defense of Water and Life, Bolivia, and Ghana National Coalition Against the Privatisation of Water. In addition there are groups opposing privatisation initiatives in East Asia, South Asia, Eastern Europe, and Southern Africa.[64]

Alternatives: water as a human right

Underlying many of these critiques by NGOs is an alternative vision which views water primarily as a common good. In this section, I would like to spell out some key components of this vision. Perhaps a useful starting point would be the Rio Declaration. The declaration specified, to recall the citation earlier, that 'in developing and using water resources, priority has to be given to the satisfaction of basic needs and the safeguarding of ecosystems. Beyond these requirements, however, water users should be charged appropriately.' This is in sharp contrast to the approach of 'full cost recovery' advocated by the proponents of privatisation. In the latter, water is presumed to be always primarily an economic good. Here, in contrast, while water is recognised as an economic good in some contexts, this economic value is subordinate to its ecological and social value. Such a recognition is important to ensure that people and ecosystems have enough water set apart to meet basic requirements.

This framework informs the new South African water policy, which insists on recognising basic human and ecosystem water requirements as a right.[65]

This fundamental emphasis on water as a human and ecological right may be the most succinct way of describing the alternative vision. Careful consideration needs to be given, of course, to the framework within which we conceive of water as a human right. There have often been criticisms, especially from Southern NGOs and activists, of a human rights approach. These criticisms have usually focused on how the conventional idea of human rights focuses on the individual rather than society; and on how a human rights perspective has often authorised the imposition of Northern values and culture on other societies.

These reservations are largely justified. But it is possible to defend an alternative vision of human rights. By defining water as a basic human right, we recognise an entitlement only to a certain minimal right to water. The recognition of such a minimal entitlement provides the basis for equitable access as well as a means to resist attempts by powerful groups to misuse/ mismanage water to meet their expanding wants at the cost of these basic rights or the environment.

There is much at stake in emphasising a rights based approach. It brings into the picture people who would otherwise be without protection; it allows for the development of institutional mechanisms to meet these rights; and it makes possible the development of a regulatory framework within which to secure rights.[66]

There is evidence of a transition to an explicit recognition of right to water in international agreements and state policies.[67] For e.g., the UN Guidelines for Consumer Protection, 1985, recognised the state responsibility to ensure drinking water availability and stated that 'Governments should, within the goals and targets set for the International Drinking Water Supply and Sanitation Decade, formulate, maintain or strengthen national policies to improve the supply, distribution and quality of water for drinking'.[68] An explicit

recognition of the connections between human health, well being and the provision of adequate clean drinking water (and nutritious food) was articulated for the first time in the 1989 Convention of the Rights of the Child (CRC).[69] As of October 1999, this convention has been signed by 191 countries – more than any other human rights treaty in history.[70] The Convention on the Elimination of All Forms of Discrimination against Women also defines adequate living conditions, particularly in relation to housing, in terms of access to sanitation, electricity and water supply amongst other facilities.[71] Similarly, in interpreting Article 8 of the Declaration on the Right to Development the UN explicitly includes water as a basic resource when it states that 'persistent conditions of underdevelopment in which millions of humans are denied access to such essentials as food, water, clothing, housing and medicine in adequate measures represent a flagrant mass violation of human rights'.[72] Nevertheless, there also continues to be serious opposition to the recognition of access to water as a basic human right. At the 2000 World Water Forum in the Hague, for example, water was declared a human need. This formulation was a rejection of the proposal made by many civil society organisations at the forum that water be recognised as a human right.[73]

What would be involved in recognising a right to water? Two aspects above all: quality and quantity. With regard to the first, i.e., right to clean water of potable quality, while the international guidelines formulated by WHO could serve as a point of reference, countries normally evolve their own 'safe' water standard in light of local conditions.

Secondly, since water is a limited resource, there are several questions about quantity: How much clean water does/should a person or a community have a right to? And right to clean water for meeting what purposes? In 1997, the Comprehensive Assessment of the Fresh Water Resources of the World, prepared for the UN Commission on Sustainable Development, stated that 'all people require access to adequate amounts of clean water for such basic needs as drinking, sanitation and hygiene. It is important to have a quantified minimum so that interested groups can monitor the progress we make towards ensuring the human right to water of potable quality'.[74] Most evaluations of the minimum required for meeting the basic domestic water requirements[75] range from 25 to 70 lpcd or litres per person per day.[76] There seems to be considerable consensus among NGOs and water professionals that 50 lpcd would be a fair minimum in all situations.[77] In this case too, of course, countries will have to evolve their own 'minimum' water standard in light of local conditions.

However, the right to clean water cannot be met merely by ensuring that centralised water delivery systems (such as those common in the developed world and in many of the urban areas of the developing nations) adhere to these nationally set standards on quality and quantity. The bulk of the world's population meets their basic water needs by drawing directly from surface and ground water resources. In view of this, it is important to ensure that these resources are clean by introducing measures to control pollution/ depletion of these resources.

As this suggests, a human rights approach to water resources management also does away with the conventional opposition between humans and the ecosystem. This opposition usually seems appropriate partially because humans are seen as pursuing infinitely expandable wants, and these are often met at the cost of environment. To think in terms of 'rights to meet basic needs', however, is to affirm a much more minimal but equitable access to water. In the context of a limited resource such as water, it provides a means of questioning the notion of wants as infinitely expandable, and actually complements and strengthens the environmentalist emphasis on ecosystem needs for water. Indeed, when attention is focused on the human right to water of marginal but numerically large communities, most of whom are outside the centrally organised water delivery systems, then the complementarity is even more marked, since such groups are the first to be threatened when the ecosystem is adversely affected.

Practical steps towards this vision

This section considers some practical steps that can be taken to translate this alternative human-rights vision of water resources management into concrete policy. Some of these measures are already being tried out in small communities; what is needed is more national commitment and global institutional support. Needless to say, these practical steps cannot be the same everywhere. They will have to be modified with due attention to local and regional specificities around socio-economic and political considerations as well as to river basin level/micro watershed level peculiarities.

While water availability may vary seasonally and spatially, in most parts of the world there is enough water locally to meet the basic water needs of the people, the ecosystem needs and the local food security needs.[78] The need to use available water equitably, efficiently and sustainably raises five fundamental issues of

- allocation efficiency (i.e. the allocation of water between competing needs and demands);
- water use efficiency (i.e. how to accomplish a given purpose using 'reasonable' amount of water);
- demand management;
- community-based water augmentation and
- institutional mechanisms to support such use.

Re-prioritisation and allocation

Worldwide, irrigated agriculture uses 69 per cent of the total water resource use and much of this water is used consumptively, i.e. it will not be available for reuse. In many arid regions this percentage is higher. In a large number of the developing nations where access

to safe drinking water and sanitation is a major problem, the percentage of water used consumptively reaches the high 90s![79] Thus the most important issue we need to address in today's water management is that of allocation- priorities.

Allocation priorities – and these are basically political decisions, not technical or managerial as they are often understood to be – should give primacy to basic water requirements for humans and ecosystems. After meeting this, second priority could be allocation for 'reasonable domestic water requirements' above the basic minimum, and for home-based production, such as kitchen-gardening. A third priority could be for 'reasonable local production needs', such as family farm based agriculture, cattle-rearing, or fishing.

The first priority would call for campaign for measures to redirect the use of water such that more water is available to marginal groups as well as to meet the ecosystem need for fresh water. The former can be attempted through a universal right to clean water. Such an international water code would seek to ensure that commercialisation/ privatisation does not reduce citizen's access to the minimum that they would require. The ecosystem needs of the water is best managed locally/ regionally, and ensuring this calls for an understanding of the carrying capacity of the fresh water resources of the region. Drawing a lesson from South African Water Policy, national and local water policies may 'identify this as 'The Reserve' which shall enjoy priority of use by right'.

After meeting this first priority, water may be charged at cost price for the second priority of reasonable domestic use. Local policies may identify what can be termed 'Reasonable use of water' for different regions, localities and watersheds.[80] After the allocation of water to meet the third priority – local production needs – the use of water for any other purpose may be subject to authorisation. Providing for a limit to use, in terms of deciding on 'The Reserve' and 'Water for Reasonable Use' for an area will ensure that food security interests are addressed to a great extent at local and household level.

Efficiency improvement

There are at least three areas where we need to focus our attention, First, since agriculture accounts for almost 70 percent of water use that is where much of the efficiency improvement has to take place.[81] The use of water in agriculture is mostly consumptive in nature. This means that water which is lost in the process of collection, storage, transfer, and application in the field is lost for good as far as that particular water cycle goes. Any improvement in the efficiency of the above services can free up and generate new water, especially for regions with growing water demand (from lifestyle changes/ new developments/ increase in population) and increasing water resource crunch.

Second, depending on the technology (irrigation methods and types) used, on-farm efficiency of water use can be increased substantially. It is common to lose more than 50 per cent of the water made available at the farm gate to unproductive purposes.[82]

Improving the on-farm efficiency especially in terms of cutting down the evapo-transpiration will free up a lot of water, that is otherwise wasted.[83] This can contribute to both improved productivity and decrease in water use.

Third, outside agriculture, there is a need to improve the water use efficiency of domestic appliances. This is especially relevant for people who use centralised water delivery system for their domestic use.

Demand management

However, in addition to reorganising allocation priorities and getting 'more crop per drop', there is a need for specific measures to redirect, in as painless a manner as possible, the use of water 'so as to equitably meet the developmental and environmental needs of the present and future generations'.[84] The approach adopted till now, based on supply management, assumes an unlimited supply of resources – whether petrol, power or water. A demand management approach in water sector could be organised around two axes. First, there could be measures to ensure that the use of water in some areas/spheres are reduced. For example, today the average water use of a US resident is 5445 lpcd, the highest in the world; in some of the developed countries like Belgium the average per capita water use is at a much lower 2292 lpcd. Compare these with the Nicaraguan average of 747 lpcd.[85] For India the average water use is 1369 lpcd. This demonstrates that there is scope for reducing the consumption at household level especially in water guzzling societies.

Another area where water can be saved substantially is in agriculture. Most national and regional agriculture policies promote cultivation of water intensive crops, irrespective of local water availability. For example, even in water scarce countries or regions, many policies encourage shifting away from traditional crops (tested and proven to have drought resistance) to thirsty cash crops like cotton, sugarcane and to floraculture.

Second, there could be measures to ensure that pollution, which places a great demand on water as a pollutant carrier, is minimised, so as to create a greater availability of clean freshwater. Many parts of the world are likely to experience substantial deterioration in water quality by 2025 under a business as usual scenario.[86] In most of North America and Europe, this will be a result of runoff and infiltration from non-point pollutant sources like intensive farming operations (which uses rising levels of fertilizer, pesticide, herbicide, antibiotics etc. and produces large quantities of animal waste). All over the world, urban waste as well as point source pollutants like factories/industries will continue to pollute water resources. In this context, it is important that incentives/disincentives are in place at every level to ensure that the water we return to the ecosystem is of such quality that the regenerative capacity of the ecosystem is not affected.

Augmentation of additional water supplies[87]

There is also a need to explore possibility of generating additional water supply. By thinking outside the framework of hydrology mission, and by looking at the ways in which many communities have managed to survive in water scarce situations, we might learn some innovative ways to augment the supply of available water. Some examples are: rainwater harvesting in small watersheds by making contour bunds, plugs, percolation tanks, or water collection wells (in arid areas of South and West Asia); roof water harvesting and storing it in under ground tanks (in Greece, India); and fog collection (in many desert areas).[88]

The scope for such technologies may be immense. For instance, in the Indian context, the Centre for Science and Environment, has argued that if there is institutional support and financial commitment, rainwater harvesting in micro-watersheds can almost entirely solve the local food and water security needs of all Indian villages.[89] An interesting aspect of these technologies is that most can be undertaken and managed at household or community level. This can help in increased access, ownership and stewardship.

Colonial experiences in many parts of the world, and the modernisation drive of the twentieth century, saw the breakdown of these systems. Many of these traditional technologies are now being revived through non-governmental and civil society initiatives. However unless there is institutional support and incentives, these will not be undertaken more broadly.

Some institutional mechanisms

In order to ensure effective adoption of these measures, it will also be necessary to devise a system of incentives and disincentives, and to institutionalise these through regulatory mechanisms.[90] Incentives could be provided to water users to switch to water saving gadgets/traditional, drought resistant crops, and to adopt low-cost, decentralised water augmenting mechanisms. Disincentives could restrict the spread of water guzzling crops, industries, and polluting production practices like intensive farming and industrial effluents.

Functioning local governance structures have to be in place to bring about many of the suggestions above. It is only through the powerful articulation of socially and environmentally aware community interests that a just water management regime can be realised. However, in order to ensure that a conducive environment is available for these local initiatives to flourish, a new thinking is called for in the international water management regime.

CONCLUSION

Recognising 'access to a minimum quantity of clean water' as a fundamental right, or recognising a certain amount of water as 'The Reserve' to meet basic human and ecosystem needs, will be important steps towards ensuring equity and sustainability. It is only within a framework that recognises the primacy and inalienability of such rights that any

participation by countries in GATS and other WTO initiatives should be considered. Such a rights framework, coupled with local and national measures for water conservation, augmentation, demand management, pollution control as well as reprioritisation and reallocation, institutionalised through an incentive disincentive system, will help us deal with the crisis in our water resource development. The effective adoption of these can be ensured through local, regional or national regulatory mechanisms.

NOTES

1 For details of annual water use, see Postel, *et al.* (1996), cited in Pielou (1998); Molden, *et al.* (2001).

2 See Owen (2000), p. 24. Most of these people are in the developing nations (which account for 4.76 of the world's 6 billion population).

3 Sampat (2000)

4 See, Gleick (1993). An analysis of the national water use pattern in the (highly industrialised) OECD countries shows that agriculture is the primary water user in those countries too, with the sector accounting for 44 per cent of the total water utilisation; and for 9 of those nations the use is higher than 60 per cent p. 8, in OECD:*Water Use*

5 Molden, *et al.* (2001)

6 At present, no cost efficient technological solution seems to be in sight for increasing the absolute amount of fresh water available.

7 For a systematic evaluation of the potential for conflicts between nation-states over water resources, see Postel (1993) pp 10-18. However as Prof. Kader Asmal, Chairperson, World Commission on Dams, has pointed out, 'Judicial or multi-lateral dispute settlements is the only way, if we are to move away from great power politics that verges on hegemony: 'Water War' rhetoric should not replace the vacuum left by the Cold War's end.' Remarks of Prof. Kader Asmal, Opening Session, Stockholm Water Symposium Laureate Lecture, Monday, 14 August 2000, Convention Centre, Stockholm.

8 Owen (2000) p 24.

9 No Profits on Water, PSI Briefing Paper, Second World Water Forum, March 2000

10 Thus, there are also efforts to privatise hydroelectric power generation. The struggle around the Maheshwar project in Narmada Valley, India, is partially in opposition to such an effort by Indian State.

11 Gleick (2000)

12 For an excellent historical analysis of the breakdown of traditional community management of water resources in the arid areas of Kutch, Gujarat, see Mahajan and Bharwada (1997). For a pan-Indian analysis see Agarwal and Narain, (1999).

13 In almost all developing countries, however, centralised water supply with piped waters and sewers is available only to the better-off section of urban groups. Poor urban settlements are not covered by such supply schemes, and no such schemes are even planned for rural areas.

[14] See Allan (2001) for a discussion on 'hydraulic mission' period.

[15] Barlow (2000).

[16] According to Barlow (Blue Gold: the global water crisis and the commodification of the Worlds Water Supply, A special report issued by International Forum on Globalisation in June 1999): While billions go without clean water, North Americans use 1,300 gallons of water per person per day'.

[17] The costs involved in managing any centralised water supply system are high. They include infrastructure development for: collection, storage, and transfer of water from the source to the user (and in the case of domestic and some industrial uses, extensive purification too) and management of the same. In addition when this water is returned to the nature it has, at least ideally, to be treated. This provision of subsidy extended to water extracting mechanisms (such as water pumps) to individuals and groups who wanted to manage their own water supply

[18] A telling example of this privileging luxury needs over basic needs is commercial floraculture, which consumes more water than many Third World flower-growing regions can sustainably spare. On the Bogota savanna (Colombia – the second largest flower growing country in the world) where half the flowers sold in the US are grown, the water table has fallen so low that household taps run dry for most of the week. Also many flower farms let pesticides/chemicals leach into the ground water or run off into area's shriveling rivers, making the available water highly polluted. Maharaj and Hohn (2001), pp 66-67.

[19] Blue Planet Project, Fact sheet No.1, 2001.

[20] The global water market is dominated primarily by French companies (Vivendi, Suez-Lyonnaise des Eaux etc.) and British companies (Thames Water, Anglican Water etc.). Among the top ten transnational water companies, the only exceptions are, US company Azurix – a subsidiary of Enron – a recent entrant, and RWE of Germany. These companies form consortiums of different permutations and combinations, or subsidiaries to bid against each other depending on the specificities of a particular contract. (BPP, Fact Sheet: 1)

[21] The World Bank has estimated the global market of water to be worth $ 800 billion. In the US alone, where the vast majority of water services remains in public hands, private water corporations generate revenues more than $ 80 billion a year, four times the annual sales of Microsoft.(The Blue Planet Project: Fact sheet no.1, 2001)

[22] The right-to-water list archive, October 2001, message dated 10/26/2001, Subject: Enron: Washington's Number One Behind-the-Scenes-GATS Negotiator; Lanz (2000); Also see Boys (2000) pp 15-16. at http://www.world-psi.org/psi.nsf/6e53a54ebe88ae01c12568270037cc33/C7659AA37C67AC26C12569190052DA9D/$FILE/Focus2_No_profit_from_water.pdf

[23] In the ensuing discussion it is important to keep in mind that these organisations work closely with national governments and the decisions are reached in particular ways due to the bargainings and leverages used by various actors. There are ongoing efforts at various international fora to further these trends, as will be seen at the ensuing discussion.

[24] In 'GATS Handbook: WTO's General Agreement on Trade in Services', Alliance for Democracy, Ruth Caplan notes that European GATS negotiators want to ensure that drinking water is included in the GATS agreement, since some of the largest water TNC's are based in Europe. Countries like the US are considering compromise positions, where they exclude transportation of bulk water across international borders by private companies, but permit water treatment,

distribution, and sewage treatment within the country. Other countries, especially in the South, 'might have a very hard time resisting the pressure from TNCs [and their allies] to put public water systems on their schedule of commitments.'

[25] Murphy (1999). I thank Sophia Murphy for discussion about the WTO.

[26] Letter from US national environmental organisations in July 1999 to Clinton Administration, Friends Of Earth: The World Trade Organisation and the Environment: A citizen Action guide.

[27] Ruth Caplan, 'GATS Handbook: WTO's General Agreement on Trade in Services', Alliance for Democracy. This section draws heavily from Caplan in its discussion of WTO and GATS.

[28] For example the US is planning to propose that GATS 'carve out' or exclude bulk water transport across international borders by private companies, and to limit application of GATS in the US to commercial operations water services. See Ruth Caplan, `GATS Handbook: WTO's General Agreement on Trade in Services',

[29] Concannon and Griffiths (2001)

[30] Tim Concannon and Hannah Griffiths, 'Stealing our water: implications of GATS for Global Water Resources', Friends of the Earth, November 2001.

[31] Bilateral trade agreements such as NAFTA (and multilateral trade negotiations such as FTAA) too, create an environment where sovereign national governments lose control on water in their jurisdiction. For example NAFTA, left open the possibility of export of water from the Great Lakes, the world's largest fresh water source. Sun Belt Water Inc. of Santa Barbara, California, in suing the Canadian government for $14 billion as the British Columbia banned the export of bulk water in 1993. [In a welcome move, in the month of February 2001, The Govt. of Canada and the 8 Great lakes states of USA have passed laws banning the removal of water from the Great Lakes, since banning the export of water could be challenged under NAFTA. Right-to-water list archive, www.iatp.org/listarchive

Bulk water transfer or the transfer of water across continents or from one country to another (from lakes/and other large water sources) in large ships or floating bags is one of the projects favoured by some transnational water companies in North America. Another similar proposed project is cutting up the glaciers and towing it to Canada/ USA for bottling. The possible environmental impacts of such developments may be quite devastating. If bulk water transfer is defined more broadly, it can include transfer of water from one river basin to another, or from one aquifer to another, as well as transfer of water which occurs through grain trade. Bulk water transfer of this kind is done not only under privatisation but also under state schemes. Here too one needs to look at the environmental and socio-economic implication for the source and for the end users.

[32] Maude Barlow, The Free Trade Areas of the Americas and the threat to social Programmes, Environmental Sustainability and Social Justice in Canada and the Americas', Council of Canadians, January, 2001. Is this fn still correct

[33] WTO Services Negotiating Proposals, October 24,2001 available at WTO website; The document numbers are: US – S/CSS/W/25; EU - S/CSS/W/38; Canada - S/CSS/W/51; Switzerland - S/CSS/W/76; Australia - S/CSS/W/112

[34] Sara Grusky, 'IMF forces Water Privatisation on Poor Countries', Globalisation Challenge Initiative, February 2001.

[35] It took a civil society resistance movement much effort to ensure that peoples right to water was not violated. right-to-water listserv archive at www.iatp.org

[36] For an analysis of this see 'The World Bank and Water Privatisation in Ghana', by Rudolf Amenga-Etego, Integrated Social Development Centre, Ghana, and Sara Grusky, Globalisation Challenge Initiative, USA:

[37] Andrei S. Juravlev, *Water utility regulation: issues and options for Latin America and the Carribean,* Economic Commission for Latin America and the Carribean, October 2000.

[38] PSI Briefing at the 2nd World Water Forum, The Hague, 2000.

[39] Right-to-water list archive, www.iatp.org/listarchive

[40] When it comes to meeting water quality and pollution standards, the world's private corporations have a poor record; they have a bad environmental record as well. For example British water corporations have been amongst the worst environmental offenders in the UK between 1989 and 1997. Source: Blue Planet project Fact sheet No.3, The Council of Canadians, WWW.canadians.org

[41] In October 2000, it was reported in water forum (a listserv at www.yahoo.com) that a cost recovery system introduced by department of Water Affairs ('notoriously imposed and driven by the World Bank and the International Monetary Fund', according to spokesperson Moloantoa Molaba of the National Health and Allied Workers' Union) in South Africa, lead to a situation where rural communities could not afford the service and began using water from polluted streams in the densely populated area and probably was the cause of the cholera outbreak in KwaZulu-Natal, SA, killing 31 people in the first week of the incidence.

[42] Even in cases where public-private partnership handles the water supply, and where public investment often exceeds that of private, at least by a few points, the control of the board is retained by the Corporations. See PSIRU document on privatisation of water_–services for a survey showing this. www.psiru.org/reportsindex.asp

[43] *Ibid*

[44] See Section 1, para 3 above. To cite a few examples: the state of Gujarat in India supports an active industrialisation policy, as a result of which water intensive industries are set up in the water scarce region of Saurashtra. Similarly, Spain's tourism development policy diverts water for golf courses for tourists, in an otherwise arid area. (right-to-water listserv, www.iatp.org/listarchive

[45] Article 18.8, Agenda 21

[46] These included other important water events like, the UN Conference on Human Environment (Stockholm, 1972); the launch of International Drinking Water Supply and Sanitation Decade, at the UN Water Conference (Mar del Plata, 1977); the UN General Assembly Proclamation of the decade 1981-1991 as the 'International Drinking Water Supply and Sanitation Decade; the Global Consultation on Safe Water and Sanitation for the 1990s (New Delhi,1990) and the International Conference on Water and the Environment: Development Issues for the 21st Century, or ICWE (Dublin,1992).

[47] UNCSD is constituted of 53 member countries at any time and meets once every year in April.

[48] Chapter 38, Agenda 21, Section dealing with international institutional arrangements.

[49] NGOs are organised into issue based 'Cacus Groups' and one of them has been on fresh water. NGO Fresh Water Cacus of the UN CSD has not been as active as some of the other Cacus groups.

[50] SEI, CAFRW, World fresh water problems – call for a new Realism, Stockholm, 1997, pp48-49.

[51] Towards this end, in the past couple of years, GWP has set up regional 'technical assistance committees (TACs)' in many parts of the world. It has also set up 'Gender and Water Alliance', which is closely linked to but is promoted as an independent network of water professionals concerned with gender issues.

[52] Currently the secretariat is based in London

[53] To guide the World Water Vision Exercise, in 1998 the World Water Council convened the World Water Commission. The three parts of the vision include vision for water for people (Water Supply and Sanitation Collaborative Council), vision for water for food (FAO) and vision for water for nature (IUCN). The perceived irreconcilable positions of the latter two gave rise to the 'Dialogue on water for food and environment' an on-going process which met for the first time in December 2000 in Sri Lanka.

[54] The statement agreed to by the Ministers and Heads of Delegations at the second world water forum, The Hague,2000 is available at http://www.worldwaterforum.net/Ministerial/declaration.html

[55] An analysis of the 2nd World Water Forum, The Hague, 2000 by David Boys, PSI, pp.15-16. Available at http://www.world-psi.org/psi.nsf/6e53a54ebe88ae01c12568270037cc33/C7659AA37C67AC26C12569190052DA9D/$FILE/Focus2_No_profit_from_water.pdf

[56] The statement by this group (of about 55 non government organisations and trade unions from around the world), however supported the process of community based participation employed for the Vision for Water and People

[57] PSI Briefing: Controlling the Vision and Fixing the Forum: the politburo of privatisation, World Water Forum, Hague, March 2000.

[58] PSI briefing paper at the World Water Forum, March 2000.

[59] FAN Statement, in a letter to members, 2000.

[60] http://www.waterobservatory.org/library/uploadedfiles/Treaty_Initiative_by_Blue_Planet_Project_ To_Sh.doc

[61] This initiative is not specific to water. However it has implications for the ways in which water policies will be formulated. (Calling for a Global Contract, Mr. Annan challenged business leaders to embrace the core principles derived from UN agreements on labour standards, human rights and environment protection and in exchange promised that UN will support free trade and open markets.)

[62] Citizens Compact members (>67) represent Citizens organisations, non-governmental efforts and advocacy groups from both South and North.

[63] http://www.iatp.org/watershed/library/admin/uploadedfiles/WATER_MANIFESTO_The_right_to_water_THE.doc

[64] http://www.waterobservatory.org/library/uploadedfiles/Cochabamba_Declaration_The.doc, http://www.waterobservatory.org/library/uploadedfilesAccra_Declaration_On_The_Right_To_Water_The.htm

[65] Principle 10 of the New Water Law states that 'The water required to meet the basic human needs referred to in principle 8 and the needs of the environment shall be identified as 'The Reserve' and shall enjoy priority of use by right. The use of water for all other purposes shall be subject to authorisation' (See White Paper on a National Water Policy for South Africa, 1998). However, according to '*Water for All*' June 2000, (a document by Rural Development Services Network, a network of South African civil society organisations, which initiated a 'Water for All' campaign in May 2000) even there in South Africa), 'water needs for reasonable domestic production needs have not been recognised'.

[66] Julia Hausermann: 'Can we do anything sensible with a rights based approach to development?' Talk given at ODI, March 31, 1999. Of course one needs to acknowledge that despite the human right to food, 827 million of the 6 billion people in the world today, a staggering 13 percent, remain chronically underfed according to FAO estimates and this percentage will further increase by 2010. A rights-based approach can only be a first step, and provide the basis for addressing problems; it obviously cannot by itself solve problems.

[67] Many of these international agreements are not legal documents, nor are they representations of international norms, but they demonstrate international intent and policy. One such example is the statement issued by the Mar del Plata Conference,1977, which explicitly recognised the right of access to water for basic needs. As Peter Gleick has pointed out most major covenants and international agreements fail to explicitly recognise water as a human right. He argues, however, that the right to water is a derivative right even in these. Among the rights explicitly protected by these agreements are rights to life, adequate food, access to a standard of living adequate for health, well-being, and right to protection from disease. Access to clean water would appear to be a pre-condition, and hence a derivative right, necessary to meet the explicit right to health and adequate standard of life. Similarly, right to life implies the right to fundamental conditions necessary to support life. Thus it could be argued that the 'right to life' and 'rights to health and well being' together include the 'right to clean water' in sufficient quantity to support life. See Peter Gleick, 'A human right to water', *Water Policy*, Vol. 1, No.5, 1999, pp. 487-503

[68] Campaign for safe drinking Water-II, CUTS/Safety Watch: Water: What are our rights to it? 1998

[69] Article 24.2 of CRC, (like Article 24.2(c) of UDHC) deals with health, food and in addition also with clean water. Source: http://www.unicef.org/crc/crc.htm

[70] Somalia and USA are yet to sign the treaty (Source: http://www.unicef.org/crc/crc.htm)

[71] Article 14.2(h), Convention on the Elimination of All Forms of Discrimination against Women (was accepted by UN General Assembly in 1979, was ratified by 139 countries and came into force in September 1981)

[72] UN 1995: The United Nations and Human Rights 1945-1995 United Nations Blue Book Series, Vol. vii, Dept of Public Information, UN Publications, New York.

[73] The workshop which explored the issue of water being a human right as opposed to a mere commodity, agreed that access to safe and clean drinking water and sanitation services is a human right. However this conclusion was not accepted by all ministers (representing over 140 governments) and thus the ministerial declaration declared water as a human need. Article on

2nd World Water Forum, by David Boys, PSI, pp.15-16. Available at http://www.world-psi.org/psi.nsf/6e53a54ebe88ae01c12568270037cc33/C7659AA37C67AC26C12569190052DA9D/$FILE/Focus2_No_profit_from_water.pdf

[74] Comprehensive Assessment of the Fresh Water Resources of the World, SEI, Stockholm.

[75] In many developing countries, persons from marginal groups survive on about 10 to 15 litres of water per day – equivalent to the amount of water used by most of us in flushing our toilets every time we use it – and the water is not necessarily of potable quality; But to use this figure as indicative of desirable minimums would be misplaced

[76] According to South African water policy 25 lpcd is defined as a right (In South African Water policy there is a stipulated minimum requirement to meet ecosystem needs too); The white paper on water prepared for the state of Guujarat, India establishes 70 lpcd as the minimum basic requirement. However for urban areas with sewage, the requirement is put at 140 lpcd.

[77] RSDN of South Africa is currently running a campaign to have the minimum raised from 25 lpcd to 50 lpcd. Gleick also estimates 50 lpcd as the minimum. The break up he provides is: Sanitation services: 20 l; Bathing 15 l; Food preparation (excluding the water required for growing the food consumed) 10 l; and drinking water (minimum required to sustain life in moderate climatic conditions): 5 l (Gleick, 1996.) As he points out, while USAID, World Bank and WHO recommend between 20 to 40 lpcd as the minimum needed to meet drinking water and sanitation requirements, each of these had excluded water for cooking, bathing and basic cleaning respectively.

[78] Most urban centers may be exceptions; Also human settlements such as those in parts of California and Israel have developed only because there are state policies which provide incentives to do so despite limited resources.

[79] Examples of some countries for which data is available for the early 1990s are Sudan (1995): 94 per cent; Afghanistan (1991): 99 per cent; Nepal (1994): 99 per cent; Guyana (1992): 99 per cent; Turkmenistan (1994): 98 per cent;

[80] Such an approach would, for example, suggest that State of California will have a lower limit for reasonable use, while in the east coast the limit for reasonable use might be higher. Use of water beyond reasonable levels may be charged at progressively higher rates.

[81] According to IWMI calculations, (using medium projections) inspite of efficiency improvement efforts, the world will still need an additional 17 per cent increase in irrigation to meet the demands of the world's population. (These estimates are based on the assumption that developed world will continue to consume the same way and that developing world will not only need to feed their larger population but also at a higher level of nutritional requirement. It also calculates global needs on the basis of aggregate numbers rather than in terms of local food security estimates). Part of this can be met through locally managed, low energy intensive technology like use of draught power or treadle-pumps for extraction of ground water etc. This can be an alternative to bringing more areas under centralised irrigation, and can also help improve productivity. More importantly it calls for a questioning of our current consumption pattern.

[82] It is to be borne in mind that part of this 'lost water' may provide useful functions like leaching the salts of the soil, improving the moisture content of soils downstream etc. and contribute towards increasing production in those fields.

[83] An interesting traditional practice in the coastal Kutch is to have mix cropped gardens with multi-level canopies, where by evapo-transpiration is reduced to a great extent.

[84] This catchy phrase – more crop per drop – was also used by United Nations Secretary General Kofi Annan in his millennium address. On the one hand, this phrase captures the essence of improving irrigation efficiency; it is also however used to push for genetically engineered crops which use less water for grain production. Quote from: Report of the United nations Conference on Environment and Development, Annex 1, Principle 3.

[85] USEPA: How much drinking water do we use in our homes, at http://www.epa.gov/OGWDW/wot/howmuch.html;

[86] According to the document, Vision for Water and Nature (IUCN, February 2000).

[87] Though there are modern technologies like desalinisation which is used by countries like Israel and Saudi Arabia, or pumping of flood water and storing it in aquifer (as reported in Governing, December 2000, for Equus Beds aquifer, Wichita, at $130 million), I do not elaborate on them, as they are beyond the reach of most developing countries.

[88] It has to be kept in mind that even in attempting something like rainwater harvesting the ecological functions of run-off has to be kept in mind and balanced against the need for augmentation.

[89] The consumption levels presumed in this estimate are quite frugal: water for basic need was calculated approximately at 13 lpcd, a quantity used by poor people in many parts today. See Agarwal (2000).

[90] Lanz (2000) cites this as one of the four lessons for a sustainable future.

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GEOPOLITICS OF WATER: FROM 'SECURITY' TO SUSTAINABILITY

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ABSTRACT

In the context of traditional state-centric geopolitics, water disputes remain closely linked to the issue of domestic stability, political legitimacy and regime survival. The question as to 'who gets, what, when, where and how' is thus ideologically constructed and politically contested among various stakeholders, both within and among sovereign states. Play here is a complex kind of hydro-geopolitics, in which knowledge is not neutral but appears in various forms of the power/knowledge equation and is used by various actors in the politics of national security, identity building, ethno-religious differentiation and the exclusion of 'others' at various levels. Taking various examples, including some from South Asia, this paper argues that in most cases, despite the 'green' rhetoric of sustainability, traditional geopolitical thinking persists in the dominant approaches to the development and management of international waterways. The highly differentiated as well as fiercely contested politics and economics of water uses continue to undermine the 'ethics of sustainability'. In order to achieve ecologically sustainable, culturally appropriate, gender sensitive and economically viable development and management of international waterways, it is important to emphasise in the first place that the specification and prioritisation of water uses is not just a scientific-technical problem area awaiting 'expert' intervention. What is also needed is a radical reformulation of the conventional understanding of sovereignty, security and development.

INTRODUCTION

Apart from being a part of life, water is older than life. Through the ages humankind has demonstrated an awareness of the significance of water. At the same time water has become the focal point of international relations in a world that is increasingly preoccupied with traditional security concerns. The ending of the Cold War has led to emergence of the so-called water discourse as a distinct and highly topical field of practical and scholarly concern.

Water and the water discourse also involve the environment. The environment that we have come to understand is an outcome of how, as Dalby puts it, 'nature is transformed by a sophisticated series of forms of knowledge and the endless writing of reports that empower it divide and control nature in order to develop and modernise it' (Dalby, 1998).

It is within this ecological discourse that a relationship between the environment and geopolitics has been formulated and a 'new environmental geopolitics' constructed. The integration of environmental issues like ozone depletion, water disputes, and trans-boundary pollution, into geopolitical reasoning suggests that a new form of power-knowledge is now a part of twentieth century geopolitics (Litfin, 1994). This does not mean that environmental problems do not exist in reality. Various examples of accelerated environmental degradation, including trans-boundary pollution, diminishing forest reserves, and depleting fresh water resources raise questions regarding the well-being of both humans and ecosystems. But, it is the manner in which environmental 'problems' are conceptualised and prioritised, or the way solutions are sought to such problems, which remains at the heart of environmental geopolitics (Seager, 1993).

The new dimensions of 'green' geopolitics are not innocent constructions of the environment. They signify a particular understanding of the world which relates closely to the traditional thinking of global geopolitics, but which has now been revived and reformulated in terms of a new language. This language is a strategy for conceptualising, thematising and even controlling nature. Consequently, ecology emerges as a geopolitical metaphor, whereas wild nature becomes a passive ecosystem infrastructure, simply waiting to be tamed by green geopolitics (Luke, 2000). Eco-systemic structures are, in other words, related to political power entrapped within the global political economy. This form of geopolitics is described by an Indian scholar, Vandana Shiva as 'Green Imperialism' (Shiva, 1998).

Once traditional geopolitics has refurbished itself in ecological terms, it is within this discourse that green geopolitics nurtures itself as both theory and practice. Thus, it is argued in this paper that concepts such as 'ecological security' and 'environmental sustainability' need to be problematised since such categories often reveal 'more' about how environmental knowledge is produced as a political resource than an appreciation of particular material circumstances. A better understanding of how a series of ecological 'threats' is constructed is possible only by challenging, or at least by going beyond, the conventional categories and typologies which privilege and protect certain actors, interests and priorities (Chaturvedi, 1998).

'Security' is a slippery term. It is widely used in political discourse, invoked by the practitioners of state craft as a totem to justify many policy actions (Bun, 1991). Security is about providing protection from threats to the social order. The process of defining whose or which identity is being threatened and by whom or what, is fundamental in determining how security is conceptualised and operationalised as a political strategy (Dillon, 1991).

The classical realist understanding of national security, as it evolved especially during the Cold War, viewed security as a function of the successful pursuit of a rational national interests defined in terms of power. It treated the sovereign state as the exclusive unit of

analysis, and was concerned with threats posed by the enemy and with how such threats were to be met with military might. In contrast, the notion of 'environmental security' appears to offer an alternative paradigm for ordering and addressing the threats in an increasingly interdependent but environmentally degraded world. Environmental security, at least in terms of its ethical connotations, appears to be concerned with any threat to the well-being of both society and ecosystems at large. In contrast, the traditional geopolitical approach, dictated and driven by a winner-take-all attitude, tends to conceptualise problems in and solutions of international relations in terms of a zero-sum game that runs against the grain of the long-term, transnational, ecologically integrated and holistic challenges of environmental degradation. The problem is basically one of a mismatch between military mind-sets and the imperatives of sustainability.

Despite the concept of environmental security adhering in principle to a different notion of security, it appears to have been co-opted or perverted by the persistent traditional geopolitical thinking. This new environmental mapping of the globe by the post-Cold War intellectuals and institutions of state craft is being extended to the discourse of sustainable development. It has been convincingly argued that the term 'sustainable development' has been co-opted by green geopolitics in order to sustain conventional development rather than develop practices that are environmentally sustainable (Shiva, 1998). Sustainable development constructs and projects all environmental problems as 'efficiency' issues, which somehow have to be managed by class of the so-called experts or techno-managers. Also, policies once enframed in the language of 'sustainable development' provide state actors with a pseudo-scientific justification in support of select global environmental agreements. Such a clever manoeuvring or manipulation of ecological rhetoric, which is deeply embedded is state-centric geopolitics, provide the political elite with an unusually cohesive power-knowledge combination for making the sustainability discourse an integral element of the new green geopolitical approach (Luke, 2000).

Providing access to freshwater has always been a highly contested political issue. After all, both power and politics in the final sense are about access to resources; natural, human or imaginary. According to Gleick (1998),' Traditional, political, and ideological questions that have long dominated international discourse are now becoming more tightly woven with other variables that loomed less large in the past, including population growth, trans-national pollution, resource scarcity and inequitable access to resources and their use'.

The issue of who gets what, when, where and how much out of trans-boundary watercourses, including aquifers, is primarily a geopolitical problem related to the multifaceted questions of domestic political concerns, ideological priorities, official foreign policy attitudes, regime stability and boundary drawing practices. Political actors involved both within and among sovereign nation-states view water security as an important aspect

of national and regional security. Furthermore various competing international positions on water issues often have a geopolitical dimension that reflects engagement with broader national objectives of security or development or both. Thus, in order to understand water conflicts and to devise appropriate solutions, it becomes necessary to address geopolitical, ideological and social aspects related to the use and development of water.

Exploring the factors mentioned above in diverse hydro-geopolitical settings should shed more light on the reasons a dispute over water-sharing between co-basin nations intensifies and even takes the shape of an international conflict when it possibly could have been resolved through mutual understanding and co-operation. Secondly, such an approach might help establish realistic guidelines for evaluating the political feasibility of these solutions, both within domestic and regional context (Turan, 1997). A quick but critical look below at some of the major water disputes in different regions of the world substantiates the above argument.

In the Middle East, water runs both above and beneath the surface of geopolitics of the region. In an already volatile and explosive climate of mutual mistrust and political hostilities, the inability of state actors to meet the demands of burgeoning population for day-to-day water needs on the one hand and their own hydro-security requirements on the other further intensifies inter-state acrimony. Since national boundaries cut across most of the watercourses, many countries are concerned that others may consume more water, thus leaving less for their own requirements. From the Israeli perspective, water is strongly linked to the 'Zionist aspirations of returning to the soil'. Water has indirectly become the 'life blood' the system, a prerequisite for a new society and of a nation deeply rooted in its land. As Galnoor (1978) argues, 'water carries' 'ideological weight' because of its association with agriculture, and for Zionists it is not simply another economic resource, but a crucial link to the question of settlements. At present, Israels meet half of its water demands using resources located outside its internationally recognised borders.

The occupation of the Golan Heights, the West Bank and Southern Lebanon enables Israel to control the water resources of the region unilaterally. If under the formula of the current peace process the principle of 'land for peace' is realised, Israel might have to give up control of its acquired water resources. From the Israeli perspective, that would mean losing access to water sources in the occupied territories. On the other hand for the Palestinians water is equally critical from the security perspective. Sovereignty over the West Bank's water resources is central to the realisation of Palestinian independence and the reconstruction of the Palestinian community. This shows that water issues are alive and kicking in the nationalist discourses of security, nationhood and identity of both the Palestinians and the Israelis. Thus, the prospects of the peace process in the Middle East, not to talk of regional co-operation, are highly limited, at least, as long as power-politics remains an extension of hydro-political considerations.

Another example is that of Turkey and Syria confronting each other over water resources, of the Tigris and the Euphrates rivers. Most notably, the Anatolia Project (GAP) has provided Turkey, situated at the head-waters of the Tigris and Euphrates river systems, extensive control over the flow of Euphrates waters. Syria has taken steps to undermine Turkish stability, sponsoring the extremists PKK (Kurdish Workers Party) in its insurgency against Turkey, a move that has prompted Turkey to threaten a blockade of water. Similarly, Nile occupies a central place in the foreign policy and the national security issues of the riparian states. A rather dramatic statement made by Boutros Boutros Ghali, when he was Egyptian foreign affairs minister, 'the next war in our region will be over the Nile, not politics' (Ohlsson, 1996), actually reveals the critical importance of the Nile waters to Egypt.

Since Egypt has retained an aggressive military stand regarding the Nile waters, domestic Ethiopian development efforts, like an attempt to dam Blue Nile, are likely to result in increasing regional tensions. In addition, Sudan has become an increasingly unstable dimension in the Middle Eastern water calculus. Ravaged by civil war and guided by a radical Islamic fundamentalism, Sudan has manifested expansionist desires over the Nile water (Beramn and Whilby, 1999). Even in Europe tensions have arisen between Hungary and Slovakia over the damming of the Danube, a classic case of how environmental disputes fuse with ethic and historical ones (Kaplan, 1998).

Though, in terms of sub-continental hydrography, the post-colonial, post-partitioned states of South Asia, are united, sharing the Indus river basin (India and Pakistan) and Ganga, Brahmaputra, Meghna basins (India-Bangladesh-Nepal), geopolitically they stand divided; as against the backdrop of asymmetry of wealth, knowledge and information, water issues continue to induce conflict and struggle among them for power in various forms (Ahmed *et al.*, 1999). On many occasions water dispute is projected as a conflict between two religious groups. The dispute between India and Bangladesh over the sharing of river Ganga was perceived, especially during the 1980's, by the Hindu fundamentalists as a struggle between Hindus and Muslims. As the Ganga is considered the holiest river by the Hindus, the constitutional conversion of Bangladesh from 'secular' to an Islamic state, made the Indian Hindu organisations project the conflict as struggle between the two religious communities (Ohlsson, 1996).

In the South Asian context, anxiety over the availability of the fresh water has more often not resulted in turning water into a security issue. Utmost secrecy is maintained regarding actual facts/figures of water availability or scarcity. For instance, whether the Farakka Barrage has actually harmed Bangladesh or not, or it has caused great physical and mental harm to many communities in Eastern Bihar and West Bengal, is one of the most well-guarded secrets of the Indian state (Ahmed *et al.*, 1999). The strategy of 'revealing', 'not revealing' and also 'partly revealing', has always been the hallmark of

traditional geopolitics of water resources, which seems to persist in South Asia. Needless to say, such 'strategies', or rather machinations of state craft, including 'cartographies of secrecy and silence' remain a major obstacle in the way of ecologically sustainable development and management of the South Asian waterways.

It can also be argued perhaps that sovereign states engaged in the relentless pursuit of their respective national self-interests are often inclined towards resolving the water conflicts in a non-cooperative, myopic way. Such policies have often proved to be a failure in the face of the growing demands, as competition over water increases, demanding that either new priorities established or innovative accommodations devised. As in the case of Indus river basin, both India and Pakistan, due to strongly entrenched notions of 'Otherness' and the alleged incompatibility of 'national positions' have shown reluctance to adopt integrated basin development plans. Although the Indus Water Treaty of 1960 has been hailed more or less universally as a success story, thanks largely to the third party mediation by the World Bank, for some what the Treaty had actually achieved with remarkable efficiency was to partition the rivers of the Indus River basin.

The imperatives of an integrated-holistic model of the sustainable development and management of the river basin would have demanded a different approach to the whole issue on the part of both the parties. Recently, the Indus Water Treaty has been publicly denounced by the Jammu and Kashmir (J and K) government as being discriminatory to the state. The J and K government feels that its interests have been hurt on at least two major counts. First, it cannot use the waters of the Indus, Jhelum and Chenab. Second, it fails to get any compensation for the power generated from the three rivers on which India exercises control. (Sharma, 2000: indianexpress.com).

The Mahakali Treaty of 1996, signed between India and Nepal is another example where the ethics of water sharing could not bypass the deeply entrenched issues of sovereignty and (in)security or for that matter ideological contestations. Thus for the dominant trend among the two nation-states has been to perceive water issues both as a major problem area and as a valuable resource to enhance their respective 'national' power and defence (Gyawali, 2000). In the process, the water issues have been (mis) used to sustain the conventional geopolitical considerations. At the same time, the technological 'interventions' of all kinds have adversely affected human ecology and the capacity of nature to renew life support systems. Those who adopt the 'mining' attitude vis-à-vis nature and its endowments, especially water, emboldened by various technological advances, often overlook the sad plight of people at the receiving end; the dis-empowered communities struggling along the international waterways or the families displaced due to the 'damming' of rivers and creation of reservoir. For certain politicians, technocrats and the contractors, such communities are neither nationalist nor patriotic enough since they oppose 'development' and 'progress' embodied in the paradigm of large

dams. In the perception of such builders of 'modern Indian temples', the traditional knowledge and wisdom of the communities is primitive and not futuristic, conservative and not radical.

It is perhaps time for the states and the regimes of the world to move from 'state centric approach' to 'people centric approach'. In today's interdependent world, spoils of the imagined victory would soon be offset by the actual costs of ecological decline and the resultant instability at local, national and regional levels. The plain and simple fact needs to be retold with all possible emphasis at one's command that historically rivers might have been used by the map makers to delineate political boundaries, but ecologically speaking rivers join and not divide nations. Any river, which flows through two or more nations, is supported by ecosystems that cut across political boundaries, and co-operation is needed among the riparian states not only to avert conflict but also to protect the ecosystem.

Further, as water is a life-sustaining element, the ethics of water sharing demands sharing both with nature and among each other. The ethics of sustainability requires a new, normative, and humane geopolitics, in place of a state-centric, power-political geopolitics of mastering space and resources. A radical reformulation of the conventional understanding of sovereignty, security and development alone will ensure sustainable development and management of the trans-boundary waters.

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Human Rights to Water-Thirst and Sanitation

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THE HUMAN RIGHT TO WATER

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ABSTRACT

The new century has begun with one of the most fundamental conditions of human development unmet: universal access to basic water services. More than a billion people lack access to safe drinking water. Two-and-a-half-billion people live without access to the adequate sanitation systems necessary to reduce exposure to water-related diseases. The failure of the international aid community, nations, and local organisations to satisfy these basic human needs has led to substantial, unnecessary, and preventable human suffering. Tens of thousand of people, mostly young children and the elderly, die *every day* from water-related diseases. This situation is intolerable, unnecessary and preventable. In my paper, I hope to answer the fundamental questions: is access to water a fundamental human right? where 'human right' takes on its full legal meaning.

INTRODUCTION

The new century has begun with one of the most fundamental conditions of human development unmet: universal access to basic water services. More than a billion people lack access to safe drinking water. Two and a half-billion people live without access to adequate sanitation systems necessary to reduce exposure to water-related diseases.

The failure of the international aid community, nations, and local organisations to satisfy these basic human needs has led to substantial, unnecessary, and preventable human suffering. Tens of thousand of people, mostly young children and the elderly, die *every day* from water-related diseases.

I believe this situation to be intolerable, unnecessary, and preventable. In this paper, I hope to answer the fundamental question: Is access to water a fundamental human right? where 'human right' takes on its full legal meaning. There are typically three different immediate reactions to this question:

- Yes, of course, there is a human right to water
- No, human rights law does not extend to water.
- Maybe, but so what? What is the point of such a right?

So I will answer three other critical questions:

If there is a human right to water, what is the *advantage* of acknowledging such a right?

- If there are advantages, what are the *implications*?
- How much water?
- How must it be provided?
- At what cost?
- What are the *obligations* of states, regional governments, organisations, and individuals in achieving these rights?

These are not scientific questions: they are legal and moral ones. When I first began working on this issue several years ago, I assumed someone had already answered them. This turned out to be wrong: this was an area in which people had pretty strong opinions, but once based on no analysis.

IS THERE A 'HUMAN RIGHT' TO WATER?

This is the heart of the problem. First of all, I use the term 'right' in the sense of genuine rights under international law, where States have a duty to protect and promote those rights for an individual.

There is an extensive body of covenants and international agreements formally identifying and declaring a range of human rights. Among the most important of these are the 1948 Universal Declaration of Human Rights (UDHR), the 1966 International Covenant on Economic, Social and Cultural Rights (ESCR), the 1966 International Covenant on Civil and Political Rights (CPR), the InterAmerican Convention on Human Rights, the Declaration on the Right to Development (DRD), and the European Convention on Human Rights. Among the rights protected by these various declarations and covenants are the rights to life, to the enjoyment of a standard of living adequate for health and well being, to protection from disease, and to adequate food.

Although access to clean water is a precondition to many of these rights, water is explicitly mentioned in none of them. What does this mean? There are three possibilities:

- The drafters actually intended to exclude a right to water.
- The drafters considered water like air so fundamental and obvious that it was thought unnecessary to include any explicit reference to it.
- The drafters considered it to be a 'derivative' right implied by the declarations – i.e. either included in the explicit rights or necessary to meet other guaranteed rights.

In thirty years of notes and background documents and formal UN minutes there is no evidence of any formal or informal discussions to intentionally exclude a right to water. For this reason, I reject the first of these three options. But just because the drafters didn't explicitly exclude it doesn't mean they meant to include it.

There is however evidence in the records, to support the conclusion that the drafters considered water to be both a fundamental and a derivative right.

What is some of the evidence? In 1948 the United Nations General Assembly approved the Universal Declaration of Human Rights (UDHR). Article 25 of the Declaration which was adopted unanimously, states:

> Everyone has the right to a standard of living adequate for the health and wellbeing of himself and of his family, including food, clothing, housing...
>
> (UN General Assembly, 1948)

This article was rewritten several times before the final wording was adopted. During the course of this rewording, the emphasis shifted from providing a general standard of living to a more encompassing right to health and wellbeing. Why was 'water' not included in this list, which includes food, clothing, and housing?

Reading the original debate around the wording is critical here: the notes of the debate make it clear that the specific provisions for food, clothing, housing, and so on were not meant to be all-inclusive, but rather representative or indicative of the 'component elements of an adequate standard of living.'

It turns out that the framers of the UDHR didn't explicitly exclude water, they considered water too obvious to include as one of the 'component elements'. In fact, they were far more worried about the other items 'food, clothing, housing…' being left out, precisely because they are not as basic.

Furthermore, I note that the standards of Article 25 cannot be satisfied without water of a sufficient quantity and quality to maintain human health and wellbeing. Not only is water fundamental, it is a necessary condition for meeting the other rights.

As a resolution of the UN General Assembly, the 1948 Human Rights Declaration is not binding on States. In the 20 years following the UDHR, work continued at the United Nations on the more binding conventions, which became two separate Covenants in 1966: the International Covenant on Economic, Social and Cultural Rights (ICESCR) and the International Covenant on Civil and Political Rights (ICCPR). As of January 1999 there were nearly 140 parties to the ICESCR and the ICCPR. Under these Covenants, each State undertakes to ensure to all individuals within its jurisdiction certain human rights and to adopt 'the necessary legislative or other measures to give them practical effect.'

Articles 11 and 12 of the ICESCR address the right to an adequate standard of living and human health. Both were adopted without any dissenting votes. Again, neither mentions water.

As with the Universal Declaration on Human Rights, access to water can be inferred as a derivative right necessary to meet the explicit rights to health and an adequate standard of life. But even more importantly the accompanying history and interpretation of the negotiations and discussions surrounding the preparation of the Convenant reveals that the Human Rights Committee (HRC) established to provide definitions and meanings took a broad interpretation of the right to life. In particular, the HRC called for an inclusive interpretation of the provision that requires States to take positive action to provide the '*appropriate means of subsistence*' necessary to support life. These means of subsistence include water.

At a minimum, therefore, international human rights laws must be interpreted, I believe, to include the right to sufficient water, of appropriate quality to satisfy the explicit right to life and the broader rights to health and wellbeing.

A second wave of international agreements and examples of State practice offer further evidence of the transition toward an explicit right to water. Beginning in the 1970s, a series of international conferences have taken on the issue of access to basic resource needs and rights to water. While the products of these conferences are not legal documents with the same standing as the covenants described above, they offer strong evidence of international intent and policy.

One of the earliest comprehensive water conferences was the 1977 Mar del Plata conference. The conference statement issued at the close of the meeting explicitly recognised the right to access to water for basic needs:

> ... all peoples, whatever their stage of development and their social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs (United Nations, 1977).

In 1986, the United Nations General Assembly adopted the Declaration on the Right to Development (DRD). Article 8 of the Declaration says:

> States should undertake, at the national level, all necessary measures for the realisation of the right to development and shall ensure, inter alia, equality of opportunity for all in their access to basic resources... (UN, 1986).

In interpreting Article 8 of the DRD, the United Nations explicitly includes water as a basic resource.

Explicit recognition of the night to water continued with the 1989 Convention of the Rights of the Child (CRC) (UN, 1989). There are other examples: let me just point out that formal State practice is moving in this direction as well. The Bill of Rights of the new Constitution of South Africa, adopted in 1994, offers a clear example of this: Section 27 (1)(b) states: 'Everyone has the right to have access to sufficient food and water.' Other arguments supporting the legal human right to water are detailed in Gleick (1999).

WHAT IS THE POINT OR ADVANTAGE OF EXPLICITLY ACKNOWLEDGING SUCH A RIGHT?

Even if the human right to water is formally accepted, what is the advantage of such an acknowledgment? After all, despite the declaration of a formal right to food, nearly a billion people remain undernourished. Let me offer five reasons for acknowledging a human right to water:

1. Acknowledging such a right would encourage the international community and individual governments to renew their efforts to meet the basic water needs of their populations.
2. By acknowledging such a right, pressures to translate that right into specific national and international legal obligations and responsibilities are much more likely to occur. As Richard Jolly of the UNDP notes:

> 'To emphasise the human right of access to drinking water does more than emphasise its importance. It grounds the priority on the bedrock of social and economic rights, it emphasises the obligations of states parties to ensure access, and it identifies the obligations of states parties to provide support internationally as well as nationally' (Jolly, 1998).

3. A third reason is to maintain a spotlight of attention on the deplorable state of water management in many parts of the world.
4. A fourth is to help focus attention on the need to more widely address international watershed disputes and to resolve conflicts over the use of shared water by identifying minimum water requirements and allocations for all basin parties.
5. Finally, explicitly acknowledging a human right to water can help set specific priorities for water policy; In particular, I argue that meeting a basic water requirement for all humans to satisfy this right should take precedence over other water management and investment decisions.

WHAT ARE THE IMPLICATIONS OF A HUMAN RIGHT TO WATER?

A right to water cannot imply a right to an unlimited amount of water. And at what cost and who should bear the cost of supplying water?

Water availability is limited by resource constraints, the need to maintain natural ecosystems, and economic by and political factors. Given such constraints on water availability, how much water is necessary to satisfy this right? Enough solely to sustain a life? Enough to grow all food sufficient to sustain life? Enough to maintain a certain economic standard of living?

Answers to these questions come from international discussions over development, analysis of the human rights literature, and an understanding of human needs and uses of water. These lead to my conclusion that a human right to water most logically applies only to 'basic needs' for drinking, cooking, and fundamental domestic uses.

Both the 1977 Mar del Plata statement and the 1986 UN Right to Development set a goal of meeting 'basic needs.' The concept of meeting basic water needs was strongly reaffirmed during the 1992 Earth Summit in Rio de Janeiro.

> In developing and using water resources, priority has to be given to the satisfaction of basic needs … (UN, 1992).

The Comprehensive Assessment of the Freshwater Resources of the World prepared for the Commission on Sustainable Development of the UN stated:

> All people require access to adequate amounts of clean water, for such basic needs as drinking, sanitation and hygiene (UN, 1997b).

The UN Convention on the Law of the Non-Navigational Uses of International Watercourses, approved by the General Assembly on May 21, 1997 (UN, 1997a), also explicitly addresses this question of water for basic human needs. Article 10 states that in the event of a conflict between uses of water in an international watercourse, special regard shall be given 'to the requirements of vital human needs.' The States negotiating the Convention included in the Statement of Understanding accompanying it an explicit definition that:

> In determining 'vital human needs', special attention is to be paid to providing sufficient water to sustain human life…

I note that Article 10 is obligatory. In interpreting Article 10, priority allocation of water in the event of conflicting demands in international watersheds goes to water for basic human needs.

HOW MUCH WATER IS NECESSARY TO SATISFY THE HUMAN RIGHT TO WATER?

It is possible to define a 'basic water requirement' and to quantify an amount (see Gleick, 1996). It is important, however, that arguments be made over the principle rather than over specific numerical definitions. Adopting a standard would, I believe, be valuable, but it is certainly not necessary for meeting basic needs. I would simply note, as described in Gleick (1996), that there is practically nowhere on earth where absolute water scarcity would prevent anyone from getting their minimum basic needs.

AT WHAT COST SHOULD THIS WATER BE PROVIDED?

Free? Full economic cost? Here the human rights literature is of little help, but the international water community is increasingly clear about the economics of water. I believe that water even for basic water requirements should be paid for but that when a basic water requirement cannot be paid for by individuals – for reasons of poverty, emergency, or circumstance – it is the responsibility of local communities, local governments, or national governments to provide that basic water requirement through subsidies or outright entitlement. I believe the amount of water, and the amount of money, involved here is so small that this should not be a major economic issue. I do, however, believe that it is a major moral issue.

IF WE ACCEPT THAT THERE IS A HUMAN RIGHT TO WATER, TO WHAT EXTENT DOES A STATE HAVE AN OBLIGATION TO PROVIDE THAT WATER TO ITS CITIZENS?

Are States obligated to actually provide this water to everyone? International human rights law obligates States to provide the institutional, economic, and social *environment* necessary to help individuals to *realise* their rights. This doesn't mean that States must provide the actual food, or the housing, or the other goods and services, or the water specified in human rights doctrine. It does mean that States cannot deprive people of these rights, and that they must provide the 'environment' necessary to help individuals realise these rights. A few people – including, unfortunately, some politically influential ones in the US – object to the concept of a human right to water (or other things) because they believe it would lead to 'entitlements.' This is a misunderstanding and misinterpretation of human rights law.

In certain circumstances, however, when individuals are unable to meet basic needs for reasons beyond their control, including disaster, discrimination, economic impoverishment, age, or disability, States must actually provide for basic needs. And I believe that meeting such minimum needs should take precedence over other allocations of spending

for economic development. This will require a redirection of current priorities at international and local levels, and it is likely to require that new resources be invested as well.

CONCLUSION

A communications and computer revolution is sweeping the globe. There is renewed interest in reaching out to outer space. International financial markets and industries are increasingly integrated and connected. And efforts are being made to ensure regional and global security. In this context, our inability to meet the most basic water requirements of billions of people has resulted in enormous human suffering and tragedy and may be remembered as the 20th century's greatest failure.

After reviewing evidence of international law, declarations of governments and international organisations, and State practices, I conclude that access to a basic water requirement must be considered a fundamental human right.

Ironically, I think the framers of early human rights language would be shocked to find out that this question would come up half a century after the early human rights efforts. If they could have foreseen that reliable provision of a resource as fundamental as clean water would be so problematic, it is reasonable now to suggest that the basic rights documents would have more explicitly included a right to water. Let me offer a possible formulation appropriate to the existing human rights declarations:

> All human beings have an inherent right to have access to water in quantities and of a quality necessary to meet their basic needs. This right shall be protected by law.

FINALLY, SO WHAT?

Will the recognition of the human right to water actually improve conditions worldwide? Perhaps not. The challenge of meeting human rights obligations in all areas is a difficult one and one which has been inadequately and incompletely addressed. But the imperatives to meet basic human water needs are more than just moral, they are rooted in justice and law and the responsibilities of individuals and governments. And when individuals and governments do meet the challenge of accepting human rights law as a tool, it can be a very powerful one.

A first step toward meeting a human right to water would be for governments, water agencies, and international and local organisations to guarantee all humans the most fundamental of basic water needs and to work out the necessary institutional, economic, and management strategies necessary for meeting those basic needs, quickly and completely.

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A HUMAN RIGHTS APPROACH TO DEVELOPMENT: SOME PRACTICAL IMPLICATIONS RURAL DRINKING WATER SECTOR

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'And Noah he often said to his wife
When he sat down to dine,
I don't care where the water goes
If it doesn't get into the wine!'
(Chesterton, 1914)

But really water is no joking matter. I began to write this paper when I was sitting in my garden. I realised how badly my roses have suffered this summer from my rather too frequent travel overseas. I felt guilty for failing in my nurturing role. The irony of this thought struck me. If felt guilty, can you imagine the sense of anguish that a mother feels when she cannot provide water for her children to drink? When after four hours of walking to a remote water source and waiting patiently in line for access to a muddy pool, she stumbles on way home, smashing her calabash-seeing the life-giving water seep into the hungry ground?

I could equally well have begun my speech by saying that during the 50 minutes allocated to me to address you this evening, 375 children will die through preventable water-related diseases.

This paper focus on an analysis of a human rights approach to development, and an exploration of its benefits and its practical implications for work of agencies supplying water. What is the value added by this approach? (although I have to admit I loath that term, it makes me nervous about our VAT returns!) The paper shall end with a few tentative recommendations for water and sanitation work.

THE HUMAN RIGHTS APPROACH TO DEVELOPMENT

Over the last three years my own work and that of my organisation, Rights and Humanity, has been focused on pioneering and developing 'A Human Rights Approach to Development'. So before turning to a discussion of the benefits of this approach. Perhaps I might explain why we adopted it in the first place.

The need for a human rights approach

Rights and Humanity was established in 1986 to prevent and alleviate human suffering by addressing the plight of people living in poverty and social isolation. It chose to do so through the promotion and realisation of human rights. Why was this necessary? What was wrong with existing approaches to development?

This paper does not review the weaknesses of development policy, but points to three concerns which were particularly evident to me during the early 1980s when I was working in the Horn of Africa on humanitarian relief and development

First, development policies of the time portrayed the weaknesses of an over emphasis on economic growth rather than human development, and an assumption that the benefits of growth would trickle down to the poor. In contrast, by using as its starting point the rights of individuals, a human rights approach stresses the importance of people-centered development.

Second, at a pragmatic level, development projects which fail to take into account the legal environment in which they are operating, miss the opportunity of redressing the inequalities and discrimination which are causes of poverty and social isolation. At worst, such omission risks undermining the development outcome we seek. I saw this myself in an African village. A project designed to provide clean water for villagers, failed because the well was built on land belonging to an absentee landlord. He returned to the village and started charging for the water, leaving the villagers worse off than they had been before.

But perhaps the most important lesson of all resulted from witnessing the resistance of the international community to prompting a solution to the mass displacement of people in the Horn of Africa. Donors relied rather on the provision of assistance in neighbouring countries – but of course only to those who survived the arduous journey. The excuse I was given by Government representatives back in Geneva was that anything more would interfere with national sovereignty. But I could not believe that the drafters of the Charter of the United Nations really intended that the world should stand back whilst needy people died. In fact, as we all know, ensuring respect for human rights gives us the legitimacy for action. Human rights advocacy can therefore be used to *prevent* human suffering. We do not need to wait until violations have taken place. We can and should use the window of opportunity afforded by pro-active human rights strategies.

What are Human Rights?

The term 'human rights' refers to those rights and freedoms that have been recognised by the global community and protected by international legal instruments. Human rights are universal. They are the birth-right of every man, woman and child. States are bound by their international obligations to respect, protect, promote and ensure the realisation of human rights. It is sometimes argued that human rights are a uniquely Western notion and that to link human rights and development is to impose the ideologies of the west on other cultures. I challenge that. To hold states accountable for their performance with relation to global human rights standards is not to impose the value system of any one part of the world on another, but to refer to universal values based on the distilled knowledge and wisdom of all our cultures.

Beginning with the Universal Declaration of Human Rights of 1948, the world community has adopted a series of global and regional texts. These include the International Convention of the Elimination of All Forms of Discrimination Against Women and the Convention on the Rights of the Child. These instruments have been drafted and voluntarily adopted by states throughout the world. The Convention on the Rights of the Child, for instance, has now been ratified by all except two countries - Somalia and the USA.

Human rights are not limited to freedom from torture and freedom of speech, but include all those rights essential for human survival, physical security, liberty and development in dignity. They include the right to a standard of living adequate for health and wellbeing, including food and housing, and the rights to education and healthcare.

For a number of years the international community used the term 'basic needs' to cover those essentials for human survival. However, the term fell out of favour, partly as a result of the fact that it failed to emphasis that individuals have an inherent *right t*o access to the basic requirements of life. Further, there was a tendency to assume that all that was necessary was to ensure the needs were met at a basic or minimum level. Attaining minimum standards may be the urgent priority, but the aspiration and rights of individuals do not stop at access to mere survival rations or basic services. Human rights require not only the eradication of absolute poverty, but also the progressive realisation of a fuller enjoyment of human potential and the continuous improvement in the quality of life.

People are increasingly talking about a human rights approach to development, although some people in the development community remain concerned that to talk in terms of human rights will politicise their work, and lead to a risk of harming relationships with host governments. But I am not proposing that development agencies start condemning human rights violations – that is the role of human rights monitoring groups. Nor am I proposing the implementation of negative conditionalities linking development assistance to human rights performance – this too frequently punishes the poor for the sins of their government.

What I am suggesting is that human rights, norms and principles can strengthen the work of development agencies by providing a context in which to analyse their work and evaluate progress. Human rights norms bring to development work additional tools for advocacy with governments, and guiding principles to shape a people-centred methodology. A human rights approach to development:

- Is positive rather than condemnatory and is about progress rather than blame, requiring us to move on from merely monitoring human *wrongs* to a pro-active promotion of human *rights*
- Is about *all* human rights, not just civil and political, but also giving greater priority to securing those economic, social and cultural rights that are the very basis for a healthy and dignified life
- Is about *all people,* about ensuring access to the resources of society for people living in poverty and social isolation, as well as the elite and powerful.

What is a Human Rights Approach to Development?

The human rights approach to development is one that is simultaneously:[1]

- A *tool* for analysis which focuses attention on the underlying inequalities and discrimination faced by people living in poverty and social isolation, which impede their development and deny them the opportunity to raise themselves out of poverty
- *A foundation* for a people – centred approach to development, based on a coherent framework of binding legal norms and accountability
- *A process* which is holistic, participatory, inclusive, and multi-sectoral, and
- *An outcome*- the empowerment of individuals to achieve their full potential, and the freedom to take up opportunities.

A tool for analysis

Viewing the circumstances of poor people through the lens of human rights can provide insight into the causes of poverty by revealing the inequalities and discrimination that so frequently underlie deprivation, and identifying the powerlessness that prevents them from influencing change. A human rights approach to development forces us to look behind the lack of access to water and sanitation, and to ask why poor people are deprived. It widens the scope of analysis to include the impediments to human development, such as lack of land rights, access to education and paid work. It requires us to address the bonds of cultural and social tradition which impede the education and development of a girl child. It forces us to acknowledge the plethora of obstacles faced by poor people in participating in democratic process – obstacles which deny them a political voice and the opportunity to influence laws and policies.

A Foundation for people-centred Development

Furthermore, such an analysis helps identify the steps necessary to bridge the divide between the aspirations of the human rights instruments and the stark reality of people's lives. Internationally recognised norms and principles provide a coherent framework for development policies and programmes. I sometimes describe international human rights law as the Alpha and the Omega. Law is the starting point that provides the necessary foundation for the protection of the rights of individuals. It is also the reference of last resort – providing a basis for enforcement and redress in the case of abuse. Ultimately, states are accountable to the international community for their efforts to secure enjoyment of human rights.

However, between the Alpha and the Omega is a whole alphabet. It is opening one's eyes to this alphabet that provides us with a human rights approach to development. What does this mean in practice? It means taking all those steps, both at the national and international levels, that are necessary to protect, respect and ensure enjoyment of human rights by all people as a basis for human development. It clearly means the incorporation of human rights standards into national law. But this is not sufficient. Equally important is the adoption of policies and actions designed to ensure that everyone enjoys their rights – the right to an adequate standard of living as much as the right to physical security. It also requires the integration of human rights principles into public administration, and education in human rights and responsibilities. Further, it requires effort to overcome cultural and social practices that discriminate against women, minorities, or the impoverished. Finally, it requires the creation of just and equitable national and international societies that provide the environment in which everyone can enjoy their rights and live in dignity.

At the World Summit for Social Development, Heads of State and Government committed themselves 'to creating economic, political, social, cultural and legal environment that will enable people to achieve social development'. This holistic approach to development is vital. Sectoral projects to support education, health, water and sanitation will not assist in eliminating poverty unless they ensure access by the poor. Improving the living conditions in a squatter settlement will not have the desired effect if the residents lack security of tenure and are evicted.

A process

Human rights legal standards reflect certain key principles including:

- Equality and non-discrimination between men and women, majority and minority
- respect for human dignity and autonomy
- the requirement of enabling participation, and
- international solidarity to secure the universal enjoyment of human rights.

A human rights approach to development requires that these principles form the basis of the policies and actions of governments and development agencies alike. Such an approach prompts development co-operation based on partnerships with the intended beneficiaries. It emphasises empowerment and participation, and requires what Mrs. Mary Robinson, the High Commissioner for Human Rights has called 'a listening approach' to human rights. It is one which brings women and men into equal partnership, and listens to the voices of the young, and of minorities, and of others too frequently ignored. It is one which promotes national and international systems based on economic justice, equity in the access to public resources, and social justice. It promotes mutual respect between peoples as a basis for peace, justice, conflict resolution, and sustainable human development.

An outcome

In a number of respects a human rights approach to development reflects some of the better methodologies utilised in development work. Development theory has long recognised that participation in the identification of priorities and in the planning, implementation and evaluation of projects help poor people to have a sense of ownership in the process and outcome of development. This in turn adds to the sustainability of the benefits after international support for the project has come to an end.

But the human rights approach is not simply methodology. It calls for a more profound paradigm shift in the way we seek global equity. It prompts a re-examination of the role and responsibilities of states acting at the national and international levels, the balance between the public and private provision of basic services, models for achieving economic and social justice and human development, the impact of globalisation, and, indeed, in the way in which we view others.

The approach is not premised on governmental largesse, but on entitlements. In this way it differs from the welfare model. The latter operates in an essentially comparative manner. Less fortunate people are compared with more fortunate individuals, and measures are taken to achieve a comparatively fairer outcome. This promotes the view that there are no absolute entitlements – only comparative entitlements. The shift in emphasis inherent in a human rights approach is particularly important for the self-esteem of poor people. The experience of using such an approach is particularly important for the self-esteem of poor people. The experience of using such an approach has shown that beneficiaries feel empowered by learning that they are entitled to their human rights.

Ensuring enjoyment by poor people of their human rights gives individuals the tools and opportunities to provide for themselves and their families, and to achieve their full potential. It is an approach to development which prompts a move from *handouts* to *empowerment*, from *charity* to *legal entitlements*. In this way poor people are dignified by being considered part of the solution, not just a problem.

In summary, a human rights approach to development is one which:

- Puts people first and promotes human-centred development
- Stresses liberty, equality and empowerment
- Recognises the inherent dignity of every human being without distinction
- Recognises and promotes equality between women and men, between minority and majority
- Promotes equal opportunities and choices for all so that everyone can develop their unique potential and have a chance to contribute to development and society
- Promotes national and international systems based on economic equity, equitable access to public resources, and social justice
- Promotes mutual respect between peoples as a basis for justice and conflict prevention and resolution.

Many grassroots organisations have long been using human rights to challenge the economic and social injustice they face, particularly indigenous peoples, women's groups, children's advocates, and the disability movement. It is an approach that is increasingly being adopted by UN agencies, bi-lateral donors, and development NGOs. It is an approach that is likely to be welcomed by Southern partners, many of whom have long been advocating for greater attention to be paid to economic, social and cultural rights, and to the implementation of the right to development.

RELEVANCE OF A HUMAN RIGHTS APPROACH IN THE WATER AND SANITATION SECTORS

Let me now turn to the relevance of a human rights approach to work in the water and sanitation sectors. In my view it is important to distinguish two theoretical aspects:

- First, the application of a general human rights approach to work in the water and sanitation sectors
- Second, the development and implementation of the *rights* to *water and sanitation*.

Applying the human rights approach to work in the water and sanitation sectors

Part of the difficulty of new buzz phrases is that they can mean different things to different people. But for me, as I have explained, the human rights approach to development means something specific. It focuses on a people-centred approach to development by:

- Providing a normative framework for state responsibility and accountability both in terms of their national laws and their national and international development policies
- Providing an holistic approach which considers every aspect of individuals' lives and prompts insight into the causes of poverty by revealing the inequalities and inequities which are so often foundation of disadvantage and lack of opportunities
- Promoting an approach to development which is participatory, inclusive, and stresses equal rights of women and men, and
- Strengthening empowerment by giving people self-respect by knowing that they are entitled to certain facilities and opportunities to assist themselves and their families out of poverty, rather than being forced to remain passive recipients of handouts.

Some of these points may sound familiar. Reading through WaterAid is already like applying a number of these principles in its work. This is exemplified by, for example, the agency's emphasis on women, on the participation of beneficiaries, and its partnerships with local organisations. However, adopting a human rights approach might widen their concerns. In undertaking human rights training for development agencies I often asked what difference the adoption of such an approach will make in their programming work – what it is that this approach requires them to do which they were not doing before, and what they need to do differently.

To take just a few examples, adopting a human rights approach to water and sanitation would force us to ask specific questions about access, such as which individuals within communities have disadvantaged or no access to those services which are provided? And, why do certain communities not have access to any services? Such an approach would identify the plight of people with disabilities unable to collect their own water or access public sanitation facilities. It would highlight the problems facing the elderly, particularly widowers and widows. It will also point to the fact that poor people who have lost their families, whether through conflict or natural disaster, are particularly vulnerable in urban areas where they may be unable to rely on the kind of community support more usual in rural areas.

Analysing the reasons for lack of access to services frequently shows up a lack of enjoyment of other rights, particularly a lack of land rights in urban areas. Many of the inhabitants of the poorest urban areas are regarded as illegal squatters, and thereby denied access to any of the public services provided to others with more secure tenure – water, sanitation, roads, electricity services all have a tendency to stop short of urban slums. Residents of squatter settlements are vulnerable to arbitrary evictions by governments seeking to 'clean up' their cities. As the experience of the Orangi sanitation project in

Pakistan has shown, tackling the question of land tenure can have a significant impact on access to basic services.

Ashok Nigam and Sadig Resheed cite this example in a UNICEF paper.[2] Orangi is home to about one million working-class people. Whilst the rich in Karachi have long had modern sanitation, the inhabitants of the squatter settlements had only bucket latrines and open sewers. In the 1970s the municipal government made a major shift in policy by accepting that these settlements were here to stay. This was a key step because it enabled people to buy titles to their homesteads, giving them a sense of permanency and the incentive to invest in improvements. After repeated requests to the municipal authorities failed to prompt action, the Orangi Pilot Project was set up to help residents develop a sanitation system themselves. Seventeen years later virtually every home in Orangi has a flush toilet connected to an underground sewage line. Health has improved, school attendance risen, and household income increased.

The human rights approach pays particular attention to the equality of rights between men and women, and so would strengthen the efforts to ensure gender-equity across the water and sanitation sectors. As the Dublin Principles of 1992 recognised: 'Women play a central part in the provision, management and safeguarding of water. This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources.[3]

Working towards gender equity is, of course, a priority of many actors in the field. But it is not just in the development and implementation of water policies that women's disadvantaged status has such disastrous consequences for their lives and those of their family. The holistic emphasis of the human rights approach draws attention to the impact that the inequalities women suffer in terms of land rights, inheritance and access to employment and credit all have on their ability to access water and sanitation. Their lack of education and frequent illiteracy often leaves them without adequate information of hygiene and other aspects of primary health care.

As the International Water and Sanitation Centre (IRC) has stated: 'In almost all developing countries, women's rights to arable land are weaker than those of men. In many situations women are granted only use rights to land, and, therefore, it is important for land reform and registration programmes to make more effort to issue titles to the actual users of land. Inheritance law and land law, including land reform laws, amendments and legislative structure review must be encouraged to adopt a general principle of statutory equality between the genders. Improving women's legal literacy makes women better able to claim their rights on an individual or collective basis. Programmes aimed at increasing awareness and acceptance of women's rights must also try to increase female representation on bodies with decision making powers over land and water rights. Village women's groups

establishing social support networks must be assisted so that women have a more secure position to fall back on, are less dependent on male relatives, and have a stronger bargaining position'.[4]

One major challenge is how water and sanitation projects fit within the wider poverty elimination agenda. I believe that water and sanitation make a vital contribution to poverty elimination. Although human rights and development theories have had different roots, over the last decade there has been a gradual convergence of analysis. The human rights community speaks of all rights as being indivisible. They are inter-related. A lack of water and sanitation clearly has an impact on the enjoyment of other human rights, such as the rights to education, health and work, which form such an essential basis for poverty elimination and human development.

Similarly, the Programme of Action adopted by the World Summit for Social Development, Copenhagen 1995, stated 'Governments, in partnership with all other development actors, in particular with people living in poverty and their organisations, should cooperate to meet the basic human needs of all, including people living in poverty and vulnerable groups, by... creating public awareness that the satisfaction of basic human needs is an essential element of poverty reduction; these needs are closely interrelated and comprise nutrition, health, water and sanitation, education, employment, housing and participation in cultural and social life'.[5]

This inter-relatedness has also been recognised by the water sector, as well as the need to set clear objectives and establish key indicators to measure the outcome of basic services. The human rights community is also struggling with the development of standards and indicators, and a joint approach between the water sectors and human rights community could considerably strengthen the outcome.

As Ghosh and Rasheed have identified, there is an emerging international consensus on the issues of water management including agreement that:

- Water is key to development
- Water is a key social and economic resource for any nation
- The right to water must be protected for equity as well as for sustainable development
- Water is key to improved health, improved nutrition and quality of life
- The private-public partnership is essential for development of the water resources
- Community based management is essential to conserve, properly utilise and develop water resources
- Sustainable water resource development is possible only through an integrated approach to soil, water, forest and livestock.[6]

This final point of sustainability is also important in the context of protecting the rights of future generations to sustainability of the world's water resources and to inherit a clean and healthy environment.

Finally, it is increasingly being recognised that water and sanitation management requires effective government at the national and local levels. Issues of good governance – which are traditionally perceived as part of the human rights agenda – are therefore particularly pertinent to the water sector. These include the necessity for transparency, the elimination of corruption, and a strengthening of democratic participation at all levels of national and municipal government.

In considering the issue of the value added by a human rights approach, let me return to my example of the well in on African village. A human rights approach to that project would have required an analysis of the land ownership and a consideration of the water rights of the landlord and the villagers. The landlord could have been brought into the project planning from the beginning so that any investment made in building the well could have been matched by agreement to fix a realistic price for the water. Since the presence of the well increased the value of his land, it might even have been possible to persuade the landlord to pay for the project or to have provided a financial contribution.

What is clear is that applying a human rights approach to water requires a thorough review of the relevant legal frameworks relating to the access to water. A review is also required of the regulatory frameworks which are in place, or need to be introduced, to ensure that poor people have access to affordable water of adequate quality.

The rights to water and sanitation

Although the International Covenant on Economic, Social and Cultural Rights (1966) in Article 11 recognises 'the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions' it does not specifically mention the right to water *per se*. Nevertheless, water is always regarded as being a part of the right to an adequate standard of living, and of the right to health, protected by Article 12 of the same Covenant, and the right to sanitation is, however, implied in the list of state action required to ensure enjoyment of the right to health. Article 12 (2) sets out some of the steps to be taken by states to ensure realisation of this right including those necessary for 'the improvement of all aspects of environmental and industrial hygiene' and for 'the prevention, treatment and control of epidemic, endemic, occupational and other diseases'.

The right to water is specifically recognised in the Convention on the Rights of the Child, Article 24, which protects the right to health and states it takes appropriate measures to 'combat diseases and malnutrition, including within the framework of primary health care, through, inter alia, the application of readily available technology and through the

provision of adequate nutritious foods and clean drinking-water, taking into consideration the dangers and risks of environmental pollution.

It goes on to oblige states to 'ensure that all segments of society, in particular parents and children, are informed, have access to education and are supported in the use of basic knowledge of ... [among other things]... hygiene and environmental sanitation'.[7] Therefore, all three aspects of WaterAid's work, access to water, sanitation and hygiene education, are recognised in human rights law.

The right to water has also been confirmed in numerous international meetings. As early as 1977, the Mar del Plata Action Plan stated that '[a] 11 people have a right to have access to drinking water'.[8] The New Delhi Declaration of 1990[9] endorsed the principle of 'some for all rather than more for some', which reflects the fundamental human rights principle of universality.

Similarly, the right to water is being increasingly relied upon as a policy imperative of water organisations and consortia, and forms the foundation principle of the World Water Vision for the 21st Century, presently being prepared for the Ministerial Conference on Water in the Hague in March 2000.

Theorists and policy-makers alike are increasingly basing their advocacy on the right to water and sanitation. Ghosh and Rasheed have argued that 'exploitation or use, of water must include the right of individuals and communities to this precious resource. Beyond the purely economic value of water resources to a nation's development, the long-term 'interest' of the nation and all its people must also be considered'.[10]

Nigam and Rasheed assert their optimism that fresh water for all is achievable early in the next millennium if a rights based approach is adopted by governments with the necessary political will and the mobilisation and allocation of adequate financial resources.[11]

According to Eric Gutierrez, 'A comprehensive definition goes beyond availability to issues of access. Access involves issues that range from a discussion of fundamental individual rights to national sovereignty rights over water.[12] It also involves equity and affordability, and the role of states and markets in water's allocation, pricing, distribution and regulation. Water security also implies social and political decision making on use – the priority to be accorded on often competing household, agricultural or industrial uses of the resource'.

There is little doubt that a right to water and sanitation exists in international law. Yet despite this recognition, the problem of access to water is getting worse. The UN has recognised that water security is now the second major resource problem facing humanity, next to the problem of the population expansion.

The United Nations Commission of Human Rights has recently appointed a Special Rapporteur to consider the right of everyone to access to drinking water supply and sanitation services. In his first report, Mr. EI Haji Guiss',[13] stresses the necessity of

identifying obstacles to the right of access to drinking water and sanitation. Recognising the impact of external factors he suggests that obstacles which impede the realisation of the right and which need to be addressed include:

- The bad management of fresh water
- The lack of planning and the unequal distribution of drinking water and sanitation services
- The problem of external debt
- Structural adjustment programmes
- The privatisation of state enterprises
- The regular increase in the cost of drinking water supplies.

IMPLICATIONS OF THE RECOGNITION OF ACCESS TO WATER AND SANITATION AS HUMAN RIGHTS

It is not possible in this paper to present a thorough analysis of the implications of recognising water and sanitation as human rights. But I should like to mention three inter-related issues that I believe are particularly pertinent for governments, those working in the water and sanitation sectors, and NGOs providing support for services. These are:

- The question of whether the state should be the provider of these services, or act as a facilitator
- The implications of these rights for cost recovery
- Questions of accountability.

State as provider or facilitator

During the water decade of 1981-90, governments were primarily seen as being the provider of basic services such as water and sanitation, although the participation of communities in decision making was encouraged. But, as Alan Nicol points out in his paper, by the time of the Dublin Conference of 1992, it was recognised that state provision was unsustainable and too expensive.[14]

Current thinking in development circles is that the state should be the facilitator and the regulator rather than the sole provider. The role of individuals, as well as of the private sector, has been recognised as important. Indeed, it is considered an advantage to encourage individuals to take responsibility for their own development. Does the introduction of a human rights approach change this analysis? Since states have the primary responsibility to ensure realisation of human rights, does recognition of access to water and sanitation as human rights put the onus back on the government to be sole provider?

Does a human rights approach, reduce the role of the individual in contributing to his or her own development? A related issue is the cost implication of recognising access to water and sanitation as human rights. Does a right to water mean individuals are entitled to receive it free of individual. In my view, the answer to those questions is negative far from restricting the role of individual, a human rights approach is premised on ensuring greater opportunities for self-help.

The wording of the International Covenant on Economic, Social and Cultural Rights sets out the basis of state responsibility. The articles are mostly written in two parts. The first confirms that states recognise the particular right; whilst the second outlines the steps to be taken by States Parties to achieve the realisation of the right. For instance, Article 12 includes among the steps to be taken by states to achieve the full realisation of the right to health '[t]he improvement of all aspects of environmental and industrial hygiene', but leaves it open how these improvements are to be made, whether, for instance, through the public provision of sanitation, private provision or a public/private mix.[15]

The state obligation wording in Article 11, recognising the right to an adequate standard of living, is even less precise. It provides: 'The States Parties will take appropriate steps to ensure the realisation of this right, recognising to this effect the essential importance of international co-operation based on free consent'. In fact there are only a couple of articles which imply state provision. By Article 13 States Parties recognise that, with a view to achieving the full realisation of the right to education, primary education shall be compulsory and available free to all.[16] Unusually, Article 9 comprises only one sentence: 'The States Parties to the present Covenant recognise the right of everyone to social security, including social insurance'. No explicit mention is made of state provision, and whilst this may be desirable, in many societies the primary social safety nets supporting people in need are provided by the family, community or religious group.

The Covenant does not therefore require that the state is the sole provider of public services. Rather it requires states to take the necessary steps towards the progressive achievement of the right of everyone to an adequate standard of living including access to water and sanitation.

Issues such as these were debated in South Africa in 1995, during the drafting of the new South African Constitution. Concerns were raised that the introduction of economic and social rights into the Bill of Rights contained in the Constitution, might lead the country into bankruptcy. It was considered essential that the rights that were protected by the Constitution should have the full backing of South African law and be enforceable by individuals. Did an inclusion of these rights require the Government to provide basic services to everyone? Did the recognition of water as a right give every person lacking adequate access to clean water the legal grounds to bring a suit against the government?

In order to air these debates fully the South African Constitutional Assembly held a public hearing on economic and social rights in Cape Town on 1st August, 1995. I was invited by the Constitutional Assembly to present the case for inclusion of economic and social rights in the Constitution setting out the international understanding of these rights and the associated state obligations. I argued that states are not obliged to provide everyone with free food, water, clothing and housing, rather to provide the legal, economic and social environment in which individuals might have the opportunity to meet their own needs and that of their families. In this, protection from discrimination and from such actions as arbitrary eviction from squatter settlements is critical.[17] This viewpoint was endorsed by a representative from a squatter organisation. He confirmed that squatters were not demanding free housing. They were demanding an end to the obstacles that denied them equal access to housing and land ownership.

Once this was appreciated, the way was open to include economic and social rights in the Constitution. The wording adopted is interesting as it illustrates the relationship between the human rights of individuals and the obligations of states. For instance, the right to water is expressed in the following manner: 'Everyone has the right to have access to... sufficient food and water'. The obligations clause requires the state 'to take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights'.[18]

Similar wording is used with respect to the right to housing, with the important addition of the statement: 'No one may be evicted from their home, or have their home demolished, without an order of court made after considering all the relevant circumstances. No legislation may permit arbitrary evictions'.[19]

But to say that states are not obliged by human rights law to be the sole provider or to provide free water and sanitation to everyone is far from saying that states bear no responsibility. It is clear that states are under an obligation to provide the legal and other environments which ensure to all access to clean water and adequate sanitation. This takes us into the role of the state as regulator. Although this has not yet been clarified in international human rights jurisprudence, I interpret this role to include the need to ensure access to the poor as well as to regulate standards.

A government is not in breach of its international obligations simply as a result of the existence of people living in abject poverty. It is a failure by states to take the necessary steps towards remedying the position that places them in breach of their international obligations. Recognising that states may not be able to ensure instant realisation of all economic, social and cultural rights, the International Covenant on these rights speaks of progressive realisation. However, it obliges states to undertake steps 'including particularly the adoption of legislative measures'.[20] In my view, this requires a review of the impact of legislation on ensuring access to water and sanitation, and analysis of the obstacles to

enjoyment, identification of those sectors and individuals not fully enjoying these rights, and the development and implementation of strategies to ensure enjoyment by everyone of their rights of access to adequate water and sanitation. Furthermore, as we have seen, the state has the obligation to protect the public health, including through sanitation and hygiene programmes. Inaction is therefore not an option.

The International Covenant on Economic, Social and Cultural Rights requires steps towards the progressive achievement of the rights 'to the maximum of its available resources'.[21] Ensuring to all access to education, housing, clean water, health services and so forth, is likely to require an increase in budgetary allocations for these essential services.

Unfortunately, in a number of countries the percentage of the national budget expended on such services is falling, whilst that set aside for military expenditure and other perceived priorities is increasing. A state which spends a disproportionate amount of its budget on armaments, for example, at the cost of social development, is in breach of its international legal obligations to take steps towards the realisation of economic, social and cultural rights, to the maximum of available resources. Further, the distribution of public resources which are allocated to the water and sanitation sectors also need to be reviewed. A government which utilises its water budget solely or primarily for securing access to water and sanitation for urban elites, could be considered in violation of its obligations to ensure universal enjoyment of human rights, including by people in remote rural areas and urban slums.

As we have seen, in urban areas the enjoyment by poor people living in squatter settlements of their rights to water and sanitation are often complicated by the lack of legal title. There have been a number of situations in which governments have undertaken slum clearance programmes over the last decade involving forced evictions without resettlement. It is now generally agreed that a state violates the right to housing if it arbitrarily evicts people from their homes.[22]

Similarly, if a state fails to implement strategies to secure the rights of the poor and vulnerable, or to do so speedily enough, it is also failing in its duties. The UN Committee on Economic, Social and Cultural Rights, which is responsible for monitoring state compliance with the obligations under the International Covenant on Economic, Social and Cultural Rights, has concluded that violations of state obligations also occur when a state fails to take the necessary action to ensure at least minimum essential levels of each of the rights. For example:

> '...a State party in which any significant number of individuals is deprived of essential foodstuffs, of essential primary health care, of basic shelter and housing, or of the most basic form of education is, prima facie, violating the Covenant'.[23]

IMPLICATIONS OF THE RIGHTS TO WATER AND SANITATION ON RECOVERABLE COSTS

Water has traditionally been recognised as a public good, the management of which falls within the remit of governments. But the notoriously wasteful use of water has prompted new approaches to sustainability. The four principles adopted by the Dublin Conference of 1992, include recognition of water as an economic good, for which a charge could be legitimately made. By then it had been recognised that external factors, such as the debt burden and the impact of structural adjustment policies, were severely limiting the ability of developing states to bear the price of the provision of water services. It was necessary to look at other sources of funds, including the private sector, and to develop methods of cost recovery, including making water a tradable commodity. The experience of the Demand Responsive Approach adopted by the UNDP/World Bank Water and Sanitation Programme, for example, has shown the importance of striking a balance between the economic value of water to users, the cost of providing services to users, and the prices charged for these services.

As Belinda Calaguas writes: 'The thinking behind treating water as an economic good was to reduce the wasteful and inefficient use of water by all sectors: industrial, domestic. Pricing water to reflect the true costs of supply, conservation, sewage and treatment of wastewater would force the different sectors to reduce their consumption of the product, and encourage efficient use (especially in agriculture, where it is estimated that 40 per cent of water used does not go into crop production). However, the story is different when it comes to the urban and rural poor who do not enjoy access to water'.[24] She goes on to point out that the 'poor in urban and peri-urban areas, on average pay up to five times more than middle and high income households connected to the municipal water system'.[25]

The human rights imperative of ensuring universal access and equity prompts a re-examination of current approaches in order to ensure that they adequately deal with such issues as access by the poor, affordability and the equitable distribution of cost recovery. As water gets scarcer it will cost more, and since the poor pay more anyway they will bear the disproportionate burden of the increasing scarcity of water. Alan Nicol writes: 'equity is a central concept in poverty-reduction and is at the heart of current global concerns about the increasing poverty gap. Equity in water and sanitation means a number of interrelated themes: in decision making, in social access to the resources, and in financial cost to consumers (the poor paying 5-10 per cent of their income against a lower proportion amongst the better off is clearly an inequitable situation)'.[26]

A further area in which the human rights approach would strengthen the responses is in regard to sanitation. It may be possible to regard water as an 'economic good' for which householders are prepared to pay on the basis of a perceived benefit, but the same

cannot be assumed with respect to sanitation. Whilst sanitation undoubtedly provides benefits to householders, there is also a clear public health need for sanitation. Ensuring the public health falls squarely within the responsibility of states, raising issues of the legal obligations of states with respect to the provision of sanitation facilities. Further consideration needs to be given to this issues, particularly in the light of the trend towards privatisation.

The Dublin Principles, endorsed at the International Conference on Environment and Development,[27] contain principles which reflect a human rights approach-such as holistic management, a participatory approach, and the involvement of women as key players. These are to be welcomed. It is the concept of water as an economic good that has led to debate. A number of interlined difficulties emerge including the determination of the 'true cost' of water, the issue of government subsidies, and of accessibility of the poor. As Gutierrez writes in his briefing paper 'some are also worried about the consequences of the economic approach. UNICEF,[28] for instance, is concerned that privatisation and tradable property rights may mean that access to water will not anymore be regarded as a right, but merely as a function of economic markets. Markets of course, generally operate on the cold iron logic of profit. This may be both and good, depending on the situation or whose point of view is being taken'.[29]

The difficulty is, of course, that whilst privatisation and a reliance on the market might lead to some greater efficiency in the use of water and contribute to sustainability, from a human rights perspective a reliance on market forces raises several critical concerns:

- The market is notoriously bad at delivering equity between rich and poor, between men and women, between majority and minority, between industrialised countries and developing countries
- It is not sufficient for ensuring access to essential services by the poor
- It is unable to deal with competing claims and questions of resource allocation between domestic use, agriculture, and industry
- It does not provide a sufficient basis for ensuring sanitation, public health and environmental protection, for ensuring sustainability and a protection of the rights of future generations
- Nor is it able to adjudicate in conflicts between different users-upstream versus downstream, or cross border disputes.

These issues can only be dealt with by governments acting at the national and international levels, which takes us back to the role of the state as facilitator and regulator. It also raises issues of national and global governance. In my view, a human rights approach with its emphasis on equity provides a coherent framework for state regulation to ensure affordable access for the poor, and to temper the inequalities inherent in the market place.

Accountability

Finally, human rights associated with accountability. To date, not much progress has been made on the human rights accountability of governments with respect to the right to water and sanitation, although I understand that the Bangladeshi government and UNICEF are currently being sued over arsenic contamination in wells in Bangladesh. We need to be much clearer about the minimum standard of acceptability for water and sanitation, and to develop consensus in this regard. In my view, this requires a joint approach between the water sector and the human rights community.

The reports of the Special Rapporteur on access to water and sanitation might be of some assistance in this regard. Standards will need to deal with accessibility, affordability and quality. Associated with this is the need to develop consensus on indicators to measure enjoyment of the rights to water and sanitation. It is necessary to clarify the steps which a government must or should take to ensure access for all, and to determine in what circumstances a government has failed in its duty to create the legal, social, cultural, political and economic environment in which everyone can enjoy their rights to water and sanitation. It is only by reading human rights obligations in the light of the consensus reached, and the political commitments made, at international conferences that the obligations of states can be clarified.

We also need to consider the accountability of other actors involved in water and sanitation. The Sphere project – a collaborative effort between a wide range of NGOs involved in disaster emergency work has considered the accountability of NGOs to the beneficiaries of emergency relief work. The project has led to the joint adoption by the partners of a Humanitarian Charter and Minimum Standards in Disaster Response. The minimum standards are set in the context of human rights law, refugee law and international humanitarian law which protects victims of conflict. The minimum standards cover a range of issues in the water, sanitation and hygiene education areas, and provide a helpful model for the wider adoption of standards and indicators.

But we would not wait for a global consensus on minimum standards before advocating for government regulation to protect the quality, affordability and accessibility of water and sanitation.

VALUE ADDED OF USING THE RIGHT TO WATER AND SANITATION AS A BASIS FOR ADVOCACY

Belinda Calaguas sets out some good arguments for utilising the right to water as a basis for advocacy work.[30]

- 'To pave the way for translating this right into specific national and international legal obligations and responsibilities

- To make the state of water management all over the world a focus of attention
- To cause the identification of minimum water requirements and allocations for all individuals, communities and nations, which will in turn help to focus attention on resolutions of international watershed disputes and conflicts over the use of shared water
- To help set priorities for water policy so that to satisfy the right to water, meeting the basic water requirement for all humans, would take precedence over other water management and investment decisions (Gleick, 1999)
- To catalyse international agreement on the issue
- To emphasise governments' obligations to ensure access as well as their obligations to provide international and national support towards efforts to gibe and protect access to clean water (Jolly, 1998, quoted in Gleick, 1999)'.

I fully endorse these reasons and emphasise the importance of strengthening advocacy efforts by stressing state obligations associated with the rights to water and sanitation, both at the national and the international levels. As I argue in my book, there is a strong case to be made for holding richer countries accountable for the legal obligation to co-operate at the international level to ensure the universal realisation of human rights.[31] It is essential that further attention be given to ensuring enjoyment of the right of everyone to access to water and sanitation, and that a far higher proportion of national and international resources are put to this effect. In our common attempts to create the political will to make this a reality, a partnership between the human rights community and the water sector would provide a firm foundation for renewed commitment and action.

CONCLUSION AND RECOMMENDATIONS

In conclusion, adoption of the human rights approach to development with its emphasis on social sector investment and a pro-poor priority is likely in the longer term to lead to more sustainable development-both human and economic to contribute to the prevention of conflict. A human rights approach to water and sanitation provides the legal framework and ethical and moral imperative of ensuring universal access and equity. Ensuring enjoyment of human rights is not optional; governments are under a legal obligation to take action to ensure that every man, women and child has access to the requirements of life in accordance with their human rights and dignity. This obligations can be used in advocacy to strengthen the political will and resource allocation necessary.

International human rights law also provides the framework for considering the accountability of states for the impact of their policies and actions, and those of the international bodies and groupings they have created –including the international financial

institutions, the World Trade organisation, the OECD and G7. It therefore prompts action to address the social impacts of structural adjustment programmes, economic globalisation, and the debt burden. Furthermore, the obligation of all states to ensure universal enjoyment of human rights provides the basis for international solidarity, such as that promoted in the 20/20 initiative promoted at the World Summit for social development. National and international solidarity are critical. As a Fulani proverb from Africa reminds us: 'Men are like two dirty hands. One of them can only be washed by the other.'

I might perhaps end the paper with tentative proposals. The first is that agencies working in the delivery of drinking water services such as WaterAid strengthen their advocacy efforts by using a human rights approach, and adopt the approach outlined this evening in your projects. The second, is that you consider expanding your work to reflect a concern for the underlying inequalities and the legal, policy and social discrimination which impede access to water and sanitation, particularly for women. As the Pakistan Orangi project so clearly indicates, negotiating secure land tenure for residents of squatter settlements can do much to promote self-help sanitation projects.

My final point is to confirm that Rights and Humanity is willing to work with WaterAid on the areas of joint concern that I have identified, in research and analysis, and perhaps also at the national level, calling on our own local partners in countries in which WaterAid works to develop a joint approach to governments to advocate for the realisation of the rights to water and sanitation for all.

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[21] International Convenient on Economic, Social and Cultural Rights, Article 2 (1).

[22] See, The Maastricht Guidelines on Violations of Economic, Social and Cultural Rights, adopted by an expert meeting in Maastricht, 22-26 January,1997.

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Diverse Perspectives

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WATER AND RIGHTS: SOME PARTIAL PERSPECTIVES

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ABSTRACT

Different users living or dependent on river make claim on the water. This claims can arise at the level of the household, farm, community, village or town, but occurs in more marked forms at the level of the political or administrative units within a country and at the level of 'co-riparian' countries. Various principles and doctrines have been advanced in this regard. These have not yet been (and may fail to be) ratified by the required number of countries. This paper looks at these different instruments as partial perspectives.

INTRODUCTION

Questions about rights relating to or in the context of water resources arise in diverse ways and contexts and from different perspectives, most of which are partial. This paper will set forth these perspectives briefly and randomly and then postulate, or at any rate raise the question of, the possibility of integrating them in some kind of framework or structure. The instances and illustrations that are cited are from the Indian context, but it is hoped that they will have a significance beyond it. It should be added that the different perspectives mentioned may overlap and that some concerns may invite examination from alternative perspectives.

Riparian perspectives

The riparian perspective is essentially the right to the water of a flowing river inhering in, or claimed by, different users located alongside (or in the vicinity) of that river. This claim can arise at the level of the household, farm, community, village or town, but occurs in more marked forms at the level of the political or administrative units within a country and at the level of 'co-riparian' countries. Various principles and doctrines have been advanced in this regard: the Harmon Doctrine of territorial sovereignty, the rights of 'prior appropriation' or 'prescriptive rights', the Helsinki principle of 'equitable apportionment for beneficial uses', and the 1997 UN Convention on the non-navigational uses of international watercourses, which has not yet been (and may fail to be) ratified by the required number of countries.

A typical instance of riparian claims and disputes is the Cauvery dispute between lower riparians Tamil Nadu and Pondicherry and upper riparians Karnataka and Kerala. This is running a troubled course of adjudication by a tribunal and it is by no means clear that the final pronouncement of the tribunal, when it is received will mark the end of the dispute. In contrast, the protracted, bitter, and at one time seemingly intractable dispute between India and Bangladesh over the waters of the Ganga appears to have been successfully resolved by the Ganges Treaty of 12 December, 1996, which, after a shaky start in 1997, seems to be working reasonably well. The Indus Treaty of 1960 between India and Pakistan is often cited as an example of successful conflict-resolution and as a surprising exception to the generally bad state of relations between the two countries.

In the present context we are not concerned with the details of those disputes or the issues involved; what we need to look at instead is the form that 'resolution' tends to take. What generally happens in such cases is that the river water is allocated among the different riparians (whether countries or units within a country), each party receiving share to be used as it sees fit. It is possible to speculate whether, ideally speaking, a better result could not be achieved through a joint, cooperative, integrated planning and management of the river as a system instead of dividing it up into fragments to be managed separately; and whether (as has been argued) a sharing of benefits may not be better than a sharing of water. However, agreement or even adjudication is better than dispute and discord, and if the ideal is not feasible, then the second-best solution is welcome. This paper is merely drawing attention to a certain perceived limitation of the riparian perspective. (Incidentally, the India-Nepal Mahakali Treaty of February 1996 claims to deal with the river in an integrated manner, but that claim is questionable, and it is not yet clear that the Treaty is even a successful instance of conflict-resolution.) Another limitation of the riparian perspective is that it tends to focus exclusively on a river and ignores everything else – groundwater aquifers, land and the ecological system of which the river is a part. The riparian perspective cannot be dismissed as irrelevant or unimportant, however; it will continue to have a place, but its limitations need to be kept in mind.

A question that arises in this context is whether the government or administration of a country or a unit within a country, in seeking to secure its riparian rights, can also *ipso facto* be said to be looking after the rights and interests of the *people*. We shall return to this idea.

Federalist perspectives

By 'federalist perspectives' one means the distribution of the rights and powers related to water to different levels in a federal structure. In the Indian Constitution, the primary entry relating to water occurs in the State List (Entry 17), but this is subject to Entry 56 in the Union List, which enables the central government to play a role with respect to inter-

state rivers to the extent that Parliament provides for such intervention through legislation. Parliament has not in fact made much use of this enabling provision, and this is what lends some substance to the general impression that in India 'water' is a state subject, though this belief is an oversimplification of a complex matter. Separately, Article 262 enables parliament to legislate a mechanism for the adjudication of inter-state river water disputes, and parliament has done so: it passed the Inter-state water Disputes Act in 1956, and several tribunals have been set up under that Act.

It is felt that there are some weaknesses in these constitutional provisions, however, suggestions have been made that the Constitution should be amended to bring water into the Concurrent List. We are not concerned with that issue here. The question that we need to ask in the current context is what kind of rights are involved in the federalist perspective. The distribution of subjects into three lists (Union, State and Concurrent) in the Constitution is essentially a distribution of legislative power, i.e., the power to make laws. The legislative powers of parliament and the state legislatures correspond to the executive powers of the central and state governments. We are therefore talking about the rights of *governments*. At a seminar on federalism held in Delhi some years ago, a discussant responded to an elaborate exposition of the constitutional provisions relating to water (the entries in the State and Union Lists, Article 262, etc.) by saying that all that was merely a question of the sharing of powers between two bureaucracies, central and state, and that she was more interested in the rights and powers of the people. That deliberately provocative statement contains a partial truth that needs to be pondered. (Incidentally, it has been held in some tribunal reports that the state's power to legislate does not imply its ownership of water. This perspective has a bearing on the people's rights of access to the natural resource base on which they depend.)

With the 73rd and 74th amendments to the Constitution, we now have a third tier in the federal structure besides the centre and the states, namely the local level or villages and cities. Among the subjects left to be devolved to that level is water management. The reform of democratic decentralisation is still in the early stages and has not yet become a full-blown reality. As and when village panchayats become well-established institutions of self-government and powers and finances are devolved to them, they will begin to play an important role with respect to water. However, it must be noted that even with decentralisation, while the state may come closer to the people, it will not become identical to the people. Village panchayats will still remain state entities and the question of the relationship between the people and the state will continue to be important.

Other matters of importance in the federalist perspective include the National Water Resources Council and the National Water Policy of 1987 approved by that Council, but these are very specific to the Indian context, so we need not go into them here.

Formal law perspectives

Water figures in Indian statute books are mainly in four ways. (i) In so far as surface water is concerned, the most significant legislation regards irrigation. There are Irrigation Acts or Irrigation and Drainage Acts in many states. (ii) As regards to groundwater, there are a few acts but there has been no significant effort to regulate extraction from the point of view of resource conservation and equity. (iii) Water quality is the concern of the Water (Control and Prevention of Pollution) Act (as well as the Environment Protection Act), and the protection of aquifers was also among the considerations that led to the establishment in a case relating to environmental concerns of the Central Groundwater Authority under the directions of the Supreme Court. (iv) A desire to provide a mechanism for the resolution of inter-state disputes led to the Inter State Water Disputes Act of 1956, to which reference has already been made.

Water *per se*, as a prime and scarce natural resource and a basic life-support need, is not the subject of any law in India. There is no explicit recognition of a right to water. However, in the course of judicial pronouncements in various cases the scope of 'fundamental rights' has been steadily widened over the years. Through interpretation and the creation of case law, the right to life has been held to include many things. It seems safe to presume that the right to water, being implied in the right to life, is indeed a fundamental right in India, though it does not follow that everyone enjoys this right. The right to safe, clean drinking water is again not explicitly laid down, but seems implicitly present in pollution control and environmental protection laws and in the pronounced judicial activism with regard to environmental matters in recent years. For instance, the courts have been much involved in the state of pollution in the Yamuna River. Similarly, a community's rights of access to the natural resource base on which it depends seems to be recognised by implicit though not by explicit legislation. (It must be added that such notional 'recognition' does not imply that the rights actually exist in practice.)

The right to irrigation waters is not on the same footing as the right to drinking water. The former right is governed by irrigation acts and here it seems to be a state-granted right and not a fundamental right. That is perhaps as it should be, but the irrigator's rights are not very well defined. The more important point is that irrigation acts vest the management and control of flowing surface waters in the state. It is immaterial whether this is ownership or not; for all practical purposes control over river waters is in the hands of the state. As we shall see this 'eminent domain' of the state can create (and has created) difficulties in the way of community initiatives.

Similarly, in the context of the Inter–State Water Disputes Act, 'inter-state' really means 'inter-governmental', and the question arises whether, in the event that two states agree on a project on an inter-state river (or a tribunal lays down the details of such a project in its award), the rights of the affected people to question the project are extinguished. If the

people likely affected have never been consulted, are they still presumed to have concurred because the governments concerned have agreed on the project? Is a tribunal's award adjudication not merely between the governments concerned but also between the government and the people, even if the latter were not parties to the tribunal's proceedings?

In so far as groundwater is concerned, the Indian Easements Act vests the easement rights to groundwater in the owner of the land above it. This makes regulation difficult and is not conducive to the promotion of either equity or resource conservation.

Civil society perspectives

The community or civil society perspective arises in three different but inter-connected contexts: (i) efforts to protect people's rights, particularly those of poor, disadvantaged communities and tribal groups, *vis à vis* the state and its agencies in the context of large projects; (ii) the move to revive traditional community-managed systems that have gone into decline ('dying wisdom' in the language of the Centre for Science and Environment); and (iii) new initiatives in social mobilisation and transformation such as Anna Hazare's in Ralegan Siddhi in Maharashtra or Tarun Bharat Sangh's (Rajendra Singh's) in Alwar District in Rajasthan. Local leadership as well as NGOs play an important role in such initiatives, promoting an awareness of traditional systems and forgotten practices as well as of the people's rights under the old and new systems, kindling motivation, providing the necessary knowledge and skills, assisting in the resolution of conflicts, mediating between civil society and the state, and empowering the people. In essence, this approach is one of legal pluralism. The leaders and NGOs go beyond formal law and stress local traditions, time-honoured practices and conventions – in a word, 'customary law'.

We must recognise that formal law (as perceived and practised by the state and its institutions) and community initiatives (and the appeal to customary law and civil society institutions) do not go well together. The former is not only not hospitable to the latter, but is often positively hostile. We have heard from Rajendra Singh how, after long-dry streams and wells had been regenerated by the people, the state stepped in to claim control over them as well as the right to license fisheries. That particular dispute may have been resolved for the time being, but the relationship between people's initiatives and the instrumentalities of the state is bound to remain an uneasy one. Singh also told us that the people established an Alwar parliament, but that it has no statutory backing and can, at any time, be undermined by the state. In fact, community initiatives often start with the best of intentions and for laudable purposes but can unwittingly run counter to formal law of statute books.

'Participatory' and 'stakeholder' perspectives

In recent years, even governments have begun to talk about people's participation. However, their notions of participation, as exemplified in programmes such as Participatory Irrigation

Management (PIM), are generally rather limited. In the first place, participation is invited at a late stage in projects planned and implemented in a wholly non-participatory manner; secondly, it is often the inability of the state to manage a project and provide the planned services that leads to the idea of implementing a transfer of responsibilities to the users; and thirdly, the state is usually unwilling to enter into a contractual relationship with users or to accept binding obligations with penalties for non-performance. The idea of participation is somewhat better understood in the context of the Joint Forest Management Programme and the Watershed Development Programme. The 1994 guidelines governing of the latter are quite enlightened, though even here there are problems in implementation.

Reference must also be made here to the currently fashionable language of 'stakeholder consultation (or participation)'. This is part of the Dublin–Rio principles, and has gained greatly in currency in recent years. Unfortunately, the connotation of both the terms in this phrase are of dubious nature.

'Participation' can vary from the full involvement of the people from the earliest stages of planning (putting people at the centre) to the mere formality of asking for their comments on a plan, programme or project prepared entirely within the governmental machinery, with no serious intention of making any significant changes. (A similar point could be made with reference to the implementation stage as well.)

As for the term 'stakeholder,' it is a flawed word that has great potential for misuse. First, it is a notion drawn by analogy from prospecting for oil or minerals and carries the connotation of an individualistic claim with the underlying implication of contestation. Secondly, it is an ethically neutral concept that lumps together every person or party having any kind of connection or concern with the project. Within the ambit of the term come only those who are likely to be adversely affected by the project or expect to enjoy the benefits that it will bring, but a wide range of others who are concerned with it in one form or another. Thus, politicians, bureaucrats, engineers, donor agencies, consultants and contractors are all 'stakeholders'. The interests and concerns of these diverse categories may not in all cases be benign and legitimate, and some may have a more vital 'stake' than others. The term 'stakeholder' however, makes no distinctions: it legitimises and levels all kinds of 'stakeholding'. Everyone is a stakeholder, and the primacy of those whose lands and habitats are taken away and who suffer a traumatic uprooting is not recognised by this term.

Even considering the only two categories of stakeholders with the greatest stake in a water resource development project, namely, project-affected people and prospective beneficiaries, the vital difference between the two tends to get blurred by the bland assimilating term 'stakeholders'. There is a cruel irony in describing the involuntary and helpless victims of a project as 'stakeholders', and this is compounded when they are put on the same footing as those who stand to benefit from the project. Let us not forget that

while in the case of the former, existing rights (i.e., natural and often centuries-old rights of access and livelihoods) are taken away, in the case of the latter, the project, by diverting river water through canals, confers new rights not earlier enjoyed. The former are 'stake-loser', whereas the latter are 'stake-gainers'.

A standard response to the hardships inflicted by such projects on the affected people is to say that while everything must be done to mitigate their hardship, development does involve costs and that some groups may have to accept a measure of hardship ('sacrifice') in the larger interests of the nation. Without entering into a detailed discussion of the fallacies involved in this line of argument, let us merely note that 'sacrifice' is the wrong word to use for an involuntary displacement from land and homestead, and that the imposition of such a 'sacrifice' is morally indefensible. Gandhiji, in whose view the Benthamite doctrine of the maximum good of the greatest number was immoral, would surely have refused to countenance the 'sacrifice for development' argument. Nor is Pareto optimality an adequate answer to this: it is not enough to say that while some are enabled by state action to acquire wealth others must be at least not worse off. That too is injustice. The project-affected persons (PAPs) must actually benefit from the project. However, while it is fashionable to refer to PAPs as 'partners in development', that sanctimonious formulation bears little resemblance to reality. Efforts to involve them in decision-making and to give them their rightful share in the benefits of the projects that impose hardships on them have either not been seriously pursued or not been successful.

Human rights perspective

Social activists who are trying to bring about the 'empowerment' of the people *vis-à-vis* the state, as well as NGOs and individuals who take up the cause of people displaced or otherwise adversely affected by a project, or who seek to protect people from the high-handedness or callousness or violence of the agencies of the state, tend to invoke (among other things) the human rights perspective. This is also a special perspective of lawyers, and there is a vast literature on the subject. It is a combination of NGO/activist concerns and lawyers' concerns that lies behind the establishment of the National Human Rights Commission. The 'tribal rights' perspective is a special variant of the human rights perspective. Resistance to certain state policies or actions that are perceived as being unjust is often articulated in the language of human rights. Unfortunately, the response of the state to such movements is often one of incomprehension and force. The 'empowerment' activists in turn tend to postulate or assume an adversarial relationship between the state and civil society and to fall into anti-state postures.

In a world in which there is injustice, oppression, deprivation, distress and torture, invoking of the idea of 'human rights' is both necessary and useful. Nevertheless, some reservations need to be entered here. The idea of 'rights' is central to modern thinking on

social and political matters, but it has a negative side as well. It is often (but not necessarily or always) an adversarial notion. Rights are usually *to* something, but they are also implicitly *against* something or someone. When I say 'This is *my* right' I am saying by implication 'It is not yours or anybody elses'; and if I say 'This is my *right*', I am asserting 'No one can take it away from me' or alternatively, 'It is somebody's duty to provide or ensure or protect it'. Consider the language surrounding the word: rights are asserted, claimed, demanded, defended, disputed, contested, fought for. Contestation and conflict seem pervasive in this discourse. Rights are, of course, necessary; it would be dangerous to downgrade or deprecate the notion; but one may wonder whether it is not possible to think of an alternative language that stresses co-operation and harmony rather than conflict.

Turning to 'human rights' the first question that occurs to me is why the qualification 'human' is needed? The answer is that we believe that certain rights are not a gift of the state, but are anterior to the state, such rights fundamentally inhere in us as human beings. Secondly, we recognise certain needs or linkages – food, habitat, access to a natural resource base – as basic to common humanity, and not to be taken away lightly or casually by the state or any other agency, such as a corporate body. Thirdly, we want to stress human dignity: we want the state not to treat anyone (not even hardened criminals) in a manner that demeans them or subjects them to excessive and unreasonable hardship or pain, or undermines their sense of personality and self-respect. We are against brutality by the agencies of the state cruel punishments, torture, and so on. There can be no disagreement with any of this. However, it is one thing to assert the primacy or fundamental nature of certain rights or to hold the state accountable for its behaviour, but quite another to say that these rights are anterior to the state. In the absence of a state, what rights does a person have except what he or she can claim or maintain by physical force? The notion of 'rights' makes sense only in the context of a state or perhaps a civil society with its own sanctions. Some of those rights would of course be more basic than others. To acknowledge this, the concept of 'fundamental rights' would surely be adequate. If we use the term 'human', we are doing no more than stressing the primacy of certain rights; we cannot give them a validity independent of the state or civil society. Perhaps all this is obvious, but it appears to this writer that we tend to use the term 'human rights' as if these rights had an autonomous existence.

A further problem with the term 'human rights' is the implied exclusion of the non-human. What about the rights of other species? The cruelty that humankind inflicts upon other species is horrendous. Do the latter not have any rights? An awareness of human cruelty has lead to an 'animal rights' movement, but what about the rights of the natural environment? Environmental rights, including the right of a river to a minimum flow, have been recognised in court decisions in certain countries. What about the rights of Earth? How can humanity survive if Earth does not? Of course environmental rights and the

rights of Earth can only be voiced by human beings, and they are being voiced. The point that I am making is that when we talk about human rights, we are implicitly divorcing humanity from the rest of nature.

As a means of avoiding both the undertone of conflict beneath the notion of 'rights' and the exclusiveness involved in ascribing rights only to human beings, an alternative notion of 'human obligations' or 'human responsibility' might be worth considering: obligations towards fellow human beings (whether they be co-riparians or anyone else, including those whose habitats and ways of living we are about to disturb, and in particular the poor and the disadvantaged); and obligations towards other species, nature and Earth itself. We shall return to this consideration.

Environmentalist perspective

This stems from a concern to protect the natural environment from human depredations in the pursuit of what goes by the name of 'development' (or what Vandana Shiva would describe as 'maldevelopment'). That concern finds expression in the assertion of the rights of aquatic life, the river (for the maintenance of its integrity and regime), the natural environment and Earth itself. Reference has already been made to this idea.

Economic perspective

This perspective perceives water as an economic good and argues that its management is best left to market forces. Its basic premise is that if property rights to water were defined and trading allowed, water markets would emerge, prices would be right, resource-conservation would take place, sustainability would be taken care of, equity would be ensured, and conflicts would automatically get resolved by the market. This is a very partial and limited perspective indeed. Recognising this, the formulation that water is an economic good is usually modified to 'water is an economic and a social good'. Yes, water is an 'economic good' when it is used for industry or agriculture and perhaps a 'social good' when used for sanitation or in hospitals or for fire-fighting; but is even 'social good' an adequate description of water as a basic human and animal need (and indeed as the sustainer of the environment of which it is a part)? Can water in that basic aspect be reduced to a commodity like cement or steel or fertilizers or soap? Is it not more akin to air? I am not ruling out water markets; they may have a role to play, but there are important issues of equity, social justice and sustainability that are unlikely to be the concerns of market forces. The glib response to this objection will be that these issues can be taken care of through 'regulation', but regulation is far from easy.

The doctrinaire call for 'privatisation' includes allowing the corporate private sector to build and operate dams across rivers for hydroelectric power and/or for irrigation. Assuming that the private sector is interested in investing in such capital-intensive, long-

gestation, modest-return projects, how are the environmental and social impacts (which have presented serious difficulties to the state in past projects) going to be handled by the private entrepreneur and manager? Supply may match demand but resource conservation may receive scant consideration; resettlement and rehabilitation aspects are likely to be given grudging attention only to the extent that resistance by those affected and public opinion compel such attention; and it is naïve to imagine that market forces will obviate conflicts or provide a magical route to their resolution. (This does not mean that I am arguing for a dominant role for the state but merely that the alternative to the state is not necessarily the corporate sector.)

Incidentally, in the context of the advocacy of water markets ('define water rights and allow trading'), a key question arises: if water is either a state resource or a community resource, and what a user (an individual or an institution) gets is a use right, how can the user have a surplus for sale, except temporarily and under special circumstances? This may seem an odd conundrum to raise, because we know that water markets do exist and serve some useful purposes, but there are difficult issues involved. (The state or the community may, of course, authorise a private entrepreneur or a cooperative society to set up a water supply agency, supply water in bulk to that agency from public or community sources, or allow that agency to establish its own project to generate supply by constructing a dam or installing tubewells, and permit it to undertake commercial supplies. However, this is not a case of 'defining water rights'.)

Priorities among uses

There are also questions of relative priorities among different uses: irrigation versus drinking water; rural versus urban demands; agricultural versus industrial demands; irrigation/power-generation versus flood-moderation; abstractions for use versus maintenance of minimum flows; etc. This is not yet one more perspective on rights, but a question of socio-politico-economic choices. However, when conflicts arise and decisions are given by the courts, such choices get translated into the language of rights.

TOWARDS A TOTAL PERSPECTIVE

Above was a broad and somewhat sketchy outline of diverse perspectives. In each case, attention was drawn to some significant limitations. As stated at the outset, all these are partial perspectives. This fact does not imply a questioning of their validity or relevance. All these perspectives are needed, and each embodies important principles or values. What we need to avoid, however, is the error of elevating a relative truth or value into an absolute one or assuming that partial perspective that one adopts for the once is in fact a total or all-embracing one.

Can we assign centrality to one or more of these perspectives? Can we arrange them in a hierarchy? Can we integrate them into a harmonious whole? A hierarchy can be forthwith ruled out: the perspectives are too diverse and the inter-relationships (ranging from the tenuous to the close) are often too subtle and complex to lend themselves to being arranged in a hierarchical structure or order. Even the assignment of centrality to some perspectives is problematic, though access to water as a basic life-support resource and respect for the source of that substance, namely nature (Earth), seem to have an arguable case for such an evaluation. Keeping this fact in view, we have to integrate and harmonise the various perspectives as inter-linked and ineluctable parts of one all-embracing perspective. In that effort, perhaps a recourse to the rich, multi-faceted notion of '*dharma*', as an over-arching, all-embracing moral order may be useful. (*Dharma* also has multiple meanings, including 'duty', 'responsibility', 'quintessential or defining function or avocation', etc.). If we think of diverse collocations such as men/women; humankind/other species/nature; consumption/conservation; present/future generations; individuals/civil society/state; formal law/customary law; upper/lower riparians (including governments at different levels or different countries; different users of water; ancient wisdom/modern science, and so on, and ask in each case what is the *dharma* (or obligation or responsibility) of one element or component to the others, we may be able to bring all the perspectives together into one harmonious whole, which will be *dharma* in its over-arching sense. This, however, is merely a hint of an idea or philosophy that needs to be worked out carefully and in detail. All that this paper offers is an adumbration of an alternative to the usual approaches and formulations.

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SEARCHING FOR BALANCE: WATER RIGHTS, HUMAN RIGHTS AND WATER ETHICS

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'By the law of nature these things are common to mankind – the air, running water, the sea and consequently the shores of the sea.'

(Institutes of Justinian, 2.1.1)[1]

'The proposed new approach to managing water resources builds on the lessons of experience. At its core is the adoption of a comprehensive policy framework and the treatment of water as an economic good...'

(World Bank, 1993, p. 10)

ABSTRACT

Worldwide, the many debates over water management emphasise the importance of establishing secure rights systems as the foundation for the efficient and equitable allocation of scarce freshwater resources. This perspective follows from global statements recognising water as an economic good and from pragmatic considerations regarding the incentives individuals have to waste resources in the absence of clear ownership rules. Private, tradable rights are the foundation for water allocation systems based on market mechanisms. According to economic theory, private rights and the presence of a market should also provide strong incentives for individuals to use water as efficiently as possible. The above pragmatic perspective has formed the basis for many efforts in many countries to reform water rights systems. There is, however, increasing dissonance between this perspective and a broad array of values or perspectives held by local water users and others who may lack formal legal rights but whose interests are affected either directly or indirectly by water allocation decisions. When rights to any resource are allocated or claimed by any one group of individuals, other individuals will lose their right to that resource and also to the values it supports. This raises questions concerning the legitimacy of the initial allocation system and whether or not those losing rights did so willingly and in an informed manner. It also raises questions regarding the authority of those who allocate rights to make such an allocation. This issue is particularly fundamental when, as in

the case of water, the resource being allocated is essential for life. Access to water is essential for human survival and the right to life is recognised as fundamental in many religions, national constitutions and international agreements. Should, then, access to a basic minimum of water be classified as a human right? Taking it a step further, is a human right being violated when water is privatised or private rights to water are issued? Classifying access to water as a human right would pull the chords of emotive and legally powerful global institutions. This said, however, arguments about the denial of human rights are most often associated with acts of commission – such as murder, torture and genocide – as opposed to acts of omission – such as the failure of a government to provide for the basic needs of its people. In general, questions about access to water for fundamental needs are more acts of omission or at most diffused commission (such as the depletion of groundwater aquifers by thousands of individual users) rather than the direct violations associated with what are commonly perceived as human rights abuses. Furthermore, looking at water through a human rights lens may obscure many of the basic ethical issues inherent in the growing effort to develop private rights systems. My perspective, articulated in this paper, is that it may be more appropriate to recognise a new category of basic rights or entitlements which differs from – but which complements – those rights commonly falling in the human rights category. This new category would not carry the sets of associations already embedded in debates over human rights. Instead it would capture and give voice to many of the fundamental ethical issues inherent in different approaches to the allocation and management systems water and other natural resources. Drawing on examples from the western US, South Asia and the Islamic world, this paper explores themes in the growing debate over water rights systems. The economic logic underlying current efforts to reform rights systems is discussed first. A discussion of the social and historical roots of concepts emphasising the public ownership of water and providing for the role of the state owner or trustee of water resources follows. Private rights approaches, the counterpart of public ownership, are discussed next, followed by an exploration of ethical issues inherent in different rights systems. Particular attention is given to the ethical foundations of other rights systems such as those evolving for intellectual property. The subsequent section focuses on links to debates over human rights and the utility of using a human rights lens for looking at water issues. The final section explores potential alternatives and introduces notions of a 'basic ethics' framework.

THEMES IN THE CONTINUING DEBATE OVER WATER RIGHTS

Debates over water rights are intensifying globally as the demand on the resource base grows and competing interests seek to ensure that adequate water is available to meet their needs or objectives. In many areas, existing patterns of water use are neither efficient nor sustainable and the development of new supplies entails high economic and environmental costs. In arid and semi-arid regions, reallocation may be a precondition for economic development (Saleth and Dinar, 1999). Debates over reallocation have many strands, but they all either explicitly or implicitly, involve changes in the way water rights are structured and allocated. My goal is to highlight many of the ethical tensions inherent in any form of water right. My starting point lies in the logic underlying most current water rights debates.

THE LOGIC UNDERLYING DEBATES OVER WATER RIGHTS

> 'For many years there has been recognition on the part of researchers and policymakers alike that secure property rights over natural resources are fundamental to giving people incentives to manage those resources sustainably' (Pinstrup-Andersen, 2000).

In global debates over water management, 'best practice' approaches generally emphasise the importance of establishing water rights systems that clearly allocate rights for individuals and groups. Water rights represent a pragmatic attempt to establish clear rules governing access to and allocation of a limited resource on the basis of economic or socially defined priorities and/or in a manner that reduces conflict, which is itself a social priority. For thousands of years water rights systems have been utilised in one form or another, to meet these objectives. Debates over water rights have become particularly intense over the past decade as the concept of water as an economic good has gained prominence and come in conflict with the concept of water as a social good.

The 1992 Dublin Conference recognised water as a social good and similar themes were reiterated at the Second World Water Forum in Hague in 2000. Both these meetings also emphasised the economic role of water and the importance of recognising it as an economic good. Few would disagree that everyone should have access to the minimal amount of water required to sustain life and health. The mechanisms for achieving the goal and the relative weighting of economic and environmental priorities are, however, widely debated. A second point of agreement is that mechanisms are needed to ensure that the water available beyond that required for basic needs is efficiently allocated to meet a wide variety of economic, environmental and social objectives.

From the above perspective, attempting to define whether water is a social or an economic good appears, on a fundamental level, to be a dead-end debate: water clearly plays both roles, the emphasis given to each role depends heavily on individual or cultural perspectives. The central issue concerns instead how roles are negotiated and contested in the on-going process through which water rights are defined, renegotiated and water itself is allocated. This said, labels can tip the balance in favour of one or another sets of values and, with the emergence of global economic agreements, such as the WTO, these labels often carry legal weight. Formal recognition of the social role of water could reduce the influence which international trade agreements have over a country or a region's ability to allocate water on non-economic grounds, regardless of their implications for trade.

The above specific context aside, the most basic issue underlying whether to treat water as an economic or as a social good appears to me to be behavioral.[2] Emphasising the economic characteristics of water implies greater use of market and economic incentives

for allocation and management. Emphasising the social characteristics of water implies a greater role for non-market administrative and political processes.

Both the strength and the limitation of approaching water from an economic perspective lie in the clarity and relative simplicity of economic behavioral theories related to private and common pool resources. The basic argument in favour of treating water as an economic good and the creation of private water rights traces back to Garret Hardin and his classic paper 'Tragedy of the Commons'(Hardin, 1968). In essence he argues that, individuals on a behavioral level, can be viewed primarily as economic actors. In this formulation, everyone's property is no one's property. Clear systems in which rights are allocated to individuals or groups solve part of this problem. The second part of the problem is the tendency for people to waste resources which are perceived as having little value. When there is no cost associated with the use of particular resource, individuals have little incentive to conserve or utilise that resource efficiently. This is also the case when there is access to a resource; individuals have little incentive to conserve or protect the resource base because they lack assurance that benefits will accrue to them. As Winpenny (1994) states, 'in many cases the failure to treat water as a scarce commodity lies at the heart of the problem.' Establishing economic incentives through a system of clear, preferably private and transferable, water rights is, under this formulation, the single most important step for encouraging the efficient use and allocation of water resources.

Clear rights remove individuals uncertainty that the actions they take to conserve or protect 'their' portion of the resource will benefit others. Rights provide individuals with a basis for planning and reduce the risks they face when making decisions requiring water availability. Economic incentives (either through pricing or market mechanisms) touch the primary behavioural chord governing individual motivations and thereby are an important mechanism for encouraging efficient use. Allocation becomes efficient if rights are transferable and the returns from water use in one application can be weighed and traded against returns from all other applications. Since markets are the primary social mechanism for doing this they should, as a result, increase the net social benefit derived from water. Debates over treating water as an economic good, water rights and the establishment of water markets and economic incentives are, in consequence intimately linked. Clarification of water rights is often viewed as the first step on a long road toward enabling market-based incentive and allocation mechanisms to function.

The theoretical logic behind treating water as an economic resource and establishing private rights systems clear. Reality, however, is a little more complex. The allocation of goods such as water that are fundamental to survival through market mechanisms alone is rarely equitable. Under market systems, access depends on the ability as well as the willingness to pay. Yet an individual's initial endowments (in the form of rights to water as well as other resources) are very unevenly distributed. Most existing water rights systems

were not devised to enable market-based transfers but as administrative mechanisms for allocating scarce supplies, avoiding conflict and meeting social goals – such as assuring access to drinking water. Traditional and modern rights systems often reflect a degree of social consensus regarding how water should be allocated among drinking, agricultural, industrial and other uses along with a pragmatic mix of mechanisms to achieve that objective. They don't match the theoretical construct needed for market-based transfers and the establishment of economic incentives. Furthermore, the rights systems often reflect deeply embedded social values and perspectives. The slate isn't clean. As a result, understanding existing water rights systems is of fundamental importance in evaluating change opportunities.

WATER RIGHT SYSTEMS

There are two broad levels at which water rights are, in most cases, defined: the constitutional level and the use or application level. The constitutional level generally relates to claims of overall ownership over the resource itself – as derived from religion or social consensus – while use and application rights are narrow and consist of allocation rules of access and use that fall within the larger concept of ownership.

Constitutional perspectives

At societal levels, water is generally viewed as commonly owned and this view forms the basis for the sovereign claims of ownership made by most governments. Notions of ownership over water generally derive from deeply rooted religious perspectives or other forms of social consensus. The sentiments encoded by the Roman emperor Justinian, 'By the law of nature these things are common to mankind – the air, running water, the sea and consequently the shores of the sea,'[3] are deeply rooted in many societies and cultures. The Roman perspective is the ultimate source for the public trust doctrine, a legal perspective on a state's responsibilities for common heritage resources that runs throughout much of the Western world and other areas influenced by English common law. The sentiments aren't, however, derived only from Roman roots. Religion is also a major source. In India, for example, space, air, water and energy have traditionally been viewed as 'incapable of being bound into property relations' ... 'No *dharmasastra* or *vyavahara* text mentions property rights of anyone, including the king, in rivers or streams' (Singh, 1991). The Islamic perspective on water is, perhaps, the strongest and most clearly articulated. According to Wescoat (1995), the *shari'a* or 'way' originally connoted the 'path to water.' It provides the ultimate basis for 'rights of thirst' that apply both to humans and animals and extend throughout the main Islamic systems of jurisprudence. Water is a gift of Allah and a broad set of social duties within Islam forbid the refusal of water, particularly surplus

water for human or animal needs, (Wescoat, 1995). Furthermore, the *hadith* that 'Muslims have a common share in three things: grass, water and fire is noted by Faruqui as making 'water as a community resource to which all, rich or poor, have a right' (Faruqui, 2001). Taken together, these historical and living traditions emphasise the fact that throughout history water has generally been viewed as a common property, common heritage resource. I believe this remains a fundamental point of consensus in most societies.

Reflecting the above social consensus, in most nations the state is viewed as the steward, owner or trustee of water resources with varying degrees of responsibility for managing them for the benefit of its citizens. State ownership is, for example, encoded in the national constitution of India and in many state constitutions in the United States. The concept of state ownership over a nation's water resource base are part of a living tradition. Caponera, for example, points out that 'most Muslim countries that have passed recent water legislation have declared all water to be part of the state or public domain' (Caponera, 2001).

The concept of state ownership provides the basis for reallocating national rights and responsibilities to lower levels of government and to individuals. It also provides the basis for a state role in prioritising water allocation among uses. Many states have established priority, often granting water for domestic uses as the highest priority. Reflecting the historically dominant nature of agriculture in most parts of the world, irrigation is frequently second; industrial and other uses follow.

The above commonalities aside, the role accorded to the state varies greatly from country to country. In India, for example, constitutional provisions and related legislation that give the state sovereign rights over water have been used as the basis for creating large water management bureaucracies within local states. In addition, the state appears to have an evolving mandate to meet the basic water needs of its citizens (see box 1). In other regions, however, a similar starting point with regard to the state ownership of water has grown in fundamentally different directions. The constitution of the American State of Colorado, for example, proclaims that water is the 'property of the public' but is 'subject to appropriation' by its inhabitants. It further emphasises that 'the right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied' (Colorado Constitution, Article XVI, Section 6).[4] This provides the basis for an emphatically private rights system in which the state's primary role focuses on water rights administration, resolution of water rights disputes and, in the case of transboundary waters, negotiation with other states. The strongly private rights position in Colorado is quite different from the trust role articulated in the constitutions of other states. In Pennsylvania and Hawaii, for example, water is viewed as being held in trust by the state for the people. Pennsylvania's constitution contains an environmental provision (added in 1972) which states: 'The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and aesthetic values of the

environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.' Similarly, the constitution of Hawaii states that 'All public natural resources are held in trust by the State for the benefit of the people'. These constitutional provisions are high-level reflections of a much more widespread, though often debated, doctrine articulating specific roles for the state in governing water and other common heritage resources: the previously mentioned public trust doctrine.

Public trust concepts

Perhaps the clearest articulation of the water rights and responsibilities accorded to the state, as well as the tensions over those rights and responsibilities have come in relation to the public trust doctrine. This doctrine has its roots in English common law and, before that, in Roman civil law as encoded by Emperor Justinian, quoted above.[5] Cynthia Koehler writes:

'The basic premise of the public trust doctrine is that the state holds navigable waters and related resources in trust for the benefit of the people of the state. The state is therefore limited in its authority to alienate those resources. The trust responsibility is an attribute of state sovereignty and is therefore beyond legislative modification.' (Koehler, 1995)

'While deriving from the concept of state ownership, the public trust is not simply a public property right. As an attribute of sovereignty, the public trust cannot be shaken off by the state through legislative abolition or even through Constitutional prohibition. The California Supreme Court has determined that the public trust embodies the state's duty to protect the 'people's common heritage' in natural resources' (Koehler, 1995).

Kirsch summarises the central principle of the public trust doctrine as follows: 'When a state holds a resource which is available for the free use of the general public, a court will look with considerable skepticism upon any governmental conduct which is calculated either to reallocate that resource to more restricted uses or to subject public uses to the self-interest of private parties.' (Kirsch, 1997)

Public trust concepts and related laws have been central, yet generally unsuccessful, focal points for environmental protection efforts in the United States. Kirsh, for example, notes: 'The environmental protection provision added to the Pennsylvania Constitution on Earth Day, 1971, has been criticised by most commentators, who have viewed efforts to enshrine environmental protection as a state constitutional value as failures.' (Kirsch, 1997). With a few notable exceptions, recent court decisions in the United States have tended to uphold private rights over community or public trust rights. The debate is nothing new. As early as 1816, Thomas Jefferson wrote a letter protesting the constraints the doctrine imposed on the use of resources at the discretion of current generations.[6] In the United States, the debate has continued ever since, with most victories going to advocates of private

BOX: 1

WATER RIGHTS AT A CONSTITUTIONAL LEVEL: THE CASE OF INDIA

In India, the ultimate ownership of water is a sovereign attribute of the nation as a whole. Individual water rights are, under Section 2 of the Easements Act, 1882, subject to the state's sovereign rights over water (Joshi, 1995) and both the Easement and the Irrigation laws 'proclaim the absolute rights of government in all natural water' (Singh, 1990). Authority over water, however, is with the exception of inter-state rivers, constitutionally, delegated to India's states. Under Entry 56 of List I (the union list) of the Constitution, the central government is given the power of 'regulation and development of inter-state rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest.' State powers are listed in Entry 17 of List II (the state list). This gives states authority over 'water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of Entry 56 of List I.'

Beyond acts and constitutional provisions related directly to water, several constitutional provisions have been interpreted by the Supreme Court as having implications for the state's responsibilities with regard to water. These include Article 21, which concerns the right of life, Article 48A, which directs the state to 'endeavor to protect and improve the environment,'and Article 51A (g) which states that 'shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers ....' Article 21 has been interpreted by the Supreme Court as implying a fundamental right to maintain the environmental systems on which life depends. While Articles 48A and 51A have traditionally been regarded as unenforceable, the courts have recently issued writs and directions based on them as well (Rosencranz and Rustomjee,1995).

The concept of fundamental rights has, in a few instances, had an impact on water use, allocation and management decisions in India. The first case in which fundamental rights played a major role involved mining in Dhera Dun, northern India. In it, the courts ordered the closure of mines because they were destroying an aquifer that was a major source of sustenance for the people (Pathak,1994). A similar decision to that in the Dehra Dun case was reached in the groundwater case Attakoya Thangal vs. Union of India (Singh,1993).In it the Kerala High Court decided that groundwater resources in the Lakshwadeep Islands were threatened by saline intrusion caused by excessive groundwater pumping by rich farmers. Residents claimed that their right to life and livelihood was threatened since the excessive pumping threatening an important common resource and thus that they were entitled to protection under Article 21. The Kerala High Court decided in their favour. As Singh states, this 'decision once again makes the right to water a natural or fundamental right under Article 21 right to life, and a common property resource for the Island (Singh, 1993). A similar decision was also reached in the case of F. K. Hussain vs. Union of India also decided in Kerala (Bushan, 1996).

rights. As the box on India documents, similar debates are present on the sub-continent. Provisions in the Indian constitution that relate to the maintenance and protection of the environment have often been viewed as unenforceable but courts have recently taken limited actions based on the provisions.

Private use rights

Private rights are the counterpoint to constitutionally embedded state rights or concepts such as the public trust doctrine. A wide variety of private water rights systems exist in different cultures and it is far beyond the scope of this paper to them here. My goal is instead to briefly summarise a few key rights concepts, which are synopsise prevalent and which have implications for current water management debates.

Rights of capture

Rights of capture are the *de facto* if not the *de jure*, system in place for water use in many countries where governmental and legal systems are weak. Early court decisions on groundwater disputes in the United States were, for example, governed by the concept of absolute ownership a landowner's right to pump without regard for the effects on other users (Bowman and Clark, 1989). Under this concept, rights of use were effectively unlimited rights of capture. In the case of groundwater resources rights of capture prevail throughout much of the world. Rights of capture are also common in some surface water systems. In Yemen, for example, upstream diverters using in spate (flood) irrigation systems, have priority over users downstream. In fact, those upstream have the right to fully meet their needs for irrigation before allowing water to flow to users downstream.[7] Such rights essentially allow any individual to divert water and use it with little or no concern to other, pre-existing uses or users. Limitations are, however, present in some cases. In India, where rights are based on English common law, rights of capture for groundwater are tied to land ownership (see box 2). In some legal systems, rights of capture are also limited to specific applications such as irrigation or, as in parts of Western United States to 'reasonable uses which, in the groundwater case, limits rights of capture to overlying uses unless injury to other overlying owners can be avoided.

From the perspectives of economics and equity, rights systems based on capture have inherent limitations. Rights to water itself are neither secure nor transferable separately from the transfer of land, or in the case of capture in basins, head-end locations. This rights system provides no economic incentive for conservation and no security that the benefits of managing the resource base will accrue to the individuals or group which invests in its management. Furthermore, in terms of equity, rights of capture allocate water to those who have the resources to capture it generally the wealthy and powerful sections of society.

Riparian rights

In many regions the concept of riparian rights applies to surface waters. Riparian rights allocate uses to lands bordering watercourses within a single basin. In principle, they entitle each riparian owner to 'a stream flow through his land in its natural condition, not materially retarded, diminished, or polluted by others' (Goldfarb, 1989). Riparian water rights are part of both British and Roman common law and are prevalent in areas where those systems have been introduced.

From an economic perspective the limitation of riparian systems are similar to those of rights of capture. Rights are not transferable and are often unrelated to the volumes used. Riparian systems are probably better from an equity perspective, but only if the condition that flow is returned to the stream in a manner that does not diminish its availability for other users can be enforced. If this condition become unenforceable, then riparian rights become virtually undistinguishable from rights of capture.

Prior appropriation

Water rights systems in much of the western United States have evolved under the concept of prior appropriation (Goldfarb, 1989). This allocates water on the basis of 'first in time is first in right.' Rights granted under the concept of prior appropriation are generally limited to beneficial uses defined as almost any on- or off-site use aside (at least historically) from the maintenance of in-stream flows. Under the prior appropriation approach, rights are established by diverting water or pumping it in the case of groundwater) and applying it to beneficial uses. Once a right is established it is protected from infringement by

BOX: 2

RIGHTS OF CAPTURE AND GROUNDWATER: THE CASE OF INDIA

In India, groundwater extraction rights are (part of parcel of) land ownership. The unlimited extraction of percolating waters is the right of every landowner (Sinha and Sharma, 1987, Jacob, 1989; and Singh, 1991). This is formally recognised in the Easements Act, 1882, which states that it is the right of every owner of land to collect and dispose within his own limits of all water under the land which does not pass in a defined channel' (quoted in Bushan, 1996). Groundwater extraction rights form part of the dominant heritage associated with land ownership. Under the Transfer of Property Act, 1882, and the Land Acquisition Act, 1894, groundwater extraction rights cannot be separated from land ownership and individuals interested in the water rights must have an ownership interest in the land (Singh, 1991; Bushan, 1996). These statutory rights reflect customary practice. Landowners generally regard wells as 'theirs' and view others, including the government, as having no right to restrict or otherwise control their 'right'to extract water.

subsequent users. The net result is a hierarchy where 'senior' rights are fully protected from any reduction due to more recently established 'junior' water uses. As the resource becomes limited, junior rights are retired first with no limitation on senior users.

Although prior appropriation based approaches have a long history only in the Western United States, they are gaining prominence in other parts of the world where attempts to reform water rights systems are taking place. Such reform programmes generally envision allocating water rights based on historical use. This approach is, effectively, the prior appropriation concept.

Prior appropriation types of approaches have the advantage that they can lead to volumetrically quantified and transferable forms of water rights. As a result, they are suited to the development of markets and similar non-administrative mechanisms for water allocation. Other approaches could be used to achieve the same end: for example, volumetrically defined, transferable rights could, in theory, be assigned without any reference to historical or current use patterns. Another major reason for advocating prior appropriation as a mechanism for allocating water rights is that it reflects political realities it is far easier to give rights to existing users in a way that reflects what they are already doing than to impose a new set of different rights. This 'real politic' approach, however, gives legal support to any existing inequities in access to and utilisation of water.

Share systems

Share systems are common in many traditional irrigation and water supply systems in Asia. They also form the basis for both the modern water districts and the traditional Hispanic *acequia* systems in Western United States (see box 3). The basic principle in share systems is that beneficiaries within the service area of a water system have proportional rights and obligations in relation to the system. In rural Gujarat, for example, wells often have numerous *baghidars* or owners. In the *chher* system of canal maintenance and management, which extended throughout Punjab and Sind during much of the 1800s, on individual right to take water from a canal was contingent on his supplying labour for its maintenance. The rights of communities and individuals to shares of water were derived from their contribution to the construction of the original canal. They were, then held responsible for supplying the labour necessary for maintenance in proportion to their share of water from the system. It was viewed as 'a balancing of reciprocal rights and duties, the provision of unpaid canal labour being the price paid for the right to take water from a canal' (Gilmartin, 1995). Similar systems exist even today in much of the Nepal Tarai. Unlike the Colorado case illustrated in box 3, most share systems do not provide for the transfer of use rights between applications or locations. In order to move beyond this limitation, concepts such as correlative rights are increasingly under discussion.

The concept of correlative rights has been developed primarily in the western United States in relation to groundwater. Correlative rights are a mixture of reasonable use and prior appropriation concepts. They have three components: '(i) overlying owners are entitled to no more than their fair and just proportion for on-site uses; (ii) as between transporters out of the basin, first in time is first in right; and (iii) overlying users have priority over transporters' (Goldfarb, 1989). Although the correlative rights system is not widely used outside of a few states in Western US, adoption of similar systems is currently being discussed as a potential 'best management practice' in some global water management debates. The core idea is to allocate the available resource among users in a manner that adapts to fluctuations in availability and to provide some protection for areas of origin while still enabling the transfer of water to other areas.

CORE ISSUES

The starting point in my analysis of the issues surrounding attempts to reform water rights lies in a statement by Per Pinstrup-Andersen: 'For many years there has been recognition on the part of researchers and policymakers alike that secure property rights over natural resources are fundamental to giving people incentives to manage those resources sustainably' (Pinstrup-Andersen, 2000). This recognition lies behind numerous professional recommendations (and in some cases, institutional reform attempts) to move water rights systems away from ill-defined rights of capture or riparian approaches and toward volumetrically defined transferable rights defined on the basis of current or historical use and water availability. The recommended systems are, as a result, similar to the appropriative rights and correlative systems of the western United States Rights systems from the Western United States are in fact, often held up as models for other regions to emulate. The underlying philosophy is similar to that in debates over the privatisation of water and other services: the advocacy of a move from common to private ownership in recognition of the behavioral incentives this generates for resource conservation as well as efficiency of allocation and use.

The above emphasis on clarifying rights highlights the often, already existing tensions between state or public ownership of water resources and the *de facto* or *de jure* private use rights that in practice govern day-to-day actions with regard to water. In many parts of the world, rights are based on the concepts discussed above but have never been encoded or legally formalised. The process of formalisation as a result raises significant ethical questions. In addition, there are substantial ethical questions inherent in the existing formulations and application private water rights. While the discussion below is not comprehensive, it does identify three of the most fundamental ethical issues involved in the inherent legitimacy of common ownership as the equity in recording rights.

BOX: 3

WATER MARKETS IN COLORADO

'Examples of functioning water markets are found in the 100-year history of water rights trading in Colorado. A particularly interesting and well-known example is found in the Northern Colorado Water Conservancy District of Colorado (NCWCD). The Colorado-Big Thompson Project, a water project that the Bureau of Reclamation began in 1937 and completed in 1957, delivers water acquired from the western slope of the Rocky Mountains to the NCWCD on the eastern side of the mountains. In turn, NCWCD delivers water to agricultural and urban users on the basis of ownership of shares in the NCWCD. These shares are readily tradable in an active market to any user able to demonstrate the ability and intent to put the water to a 'beneficial use.' The NCWCD facilitates trading by maintaining a bulletin board for offers to buy and sell'.

Source: Howe (2001)

Inherent Legitimacy: As discussed above, the idea of the common ownership of water is deeply rooted in many cultures and is reflected in the constitutions of many states and nations. Some view this common ownership as an inalienable aspect of sovereignty; for others it is part of a god-given common heritage. The ethics of establishing unbounded private rights over such a common heritage are highly questionable. Current debates over intellectual property emphasise the creative process as the core factor establishing a right. Rights arise through the act of creation. Where water is concerned, however, impact of the third parties water transfers on the only creative action involved is the act of diversion or capture. While this may, in some cases, require substantial initiative and investment, no human creative process was involved in creation of the resource itself. As a result, allocation on the basis of capture or existing use abrogates the previously unexercised rights of others to or common heritage.

Legitimacy and Equity of Establishment Process: Socially marginal groups are rarely in a position to articulate or defend their interests when rights are formalised through legal processes established by culturally and economically dominant groups. The establishment of water rights through prior appropriation in the western United States provides a clear case in point. The appropriative rights doctrine in Western United States emerged in the context of mining booms and the development of irrigation systems by immigrants from the East Coast. In both cases, diversion was essential for operations. Appropriations were recorded then and subsequently through the legal and governmental systems settlers brought with them from the settled east. These systems functioned in English and were staffed by governmental officials. Hispanic and Native American communities – which in some cases had established irrigation systems hundreds of years

prior to those of the immigrants – had little knowledge of the new rights system and slight ability to document their already existing uses. In major basins, such as the Rio Grande, these communities lost use rights. They are now battling to have them returned. As economically backward and often poorly educated communities, they face an uphill battle. As Northern New Mexico Legal Services comments, 'The degree to which a traditional water user is able to participate effectively in the process of establishing a water right is determined by the resources available to the client.' (Northern New Mexico Legal Services, 2000). Most water rights are, as a result, held by dominant sections of the culture. Such issues are common in all water rights allocation processes. Economically and politically dominant cultural groups are generally in a far better position to have rights recorded than other groups even where the process is not subject to explicit political or other manipulation. This can, and often does, exclude minority and other stakeholders from access to water regardless of long established usage.

Application equity and the impact on third parties in the context of water markets: One of the main reasons behind moves to establish private water rights has been to enable water markets to evolve. While concepts of state or public ownership could, in theory, provide a voice for public interests in the context of water transfers, this has not been the case in many water debates in the western United States, where private rights dominate. Because water is a flowing resource, however private rights are formulated, actions by rights holders involving the transfer of water often have major implications for third parties and the environment. This has been particularly evident in the case of water transfers through market mechanisms based on private rights. According to the National Research Council; 'The effects [of transfers] on third parties – people, communities, and environmental interests – are beyond the scope of considerations legally required of state decision makers. This limitation is particularly acute in Colorado because transfers are controlled entirely by the law of prior appropriation; no judge or administrator is authorised to apply public interest criteria.' (National Research Council, 1992). The council concludes that 'there are inherent limitations in the capability of market mechanisms to deal with nonmarket goods and externalities' (National Research Council, 1992). It further states. 'The committee's basic conclusions are that allocation processes should accord third parties with water rights – and those without them – legally cognisable interests in transfers and that states should develop new ways to consider these interests.' (National Research Council, 1992) Furthermore, studies indicate that it is 'frequently not practicable to compensate the losers from water transfers due to difficulties in identification and their potential existence in different legal jurisdictions'(Howe, 2001).

To me the above three specific ethical questions point to what is, perhaps, the core ethical concern in discussions over water rights and water transfers: balancing public

interest and common ownership (including an individual's right to access to essential water) with private incentives. There is little ethical justification for abrogating the common heritage nature of water resources. Notions of private property are generally founded in the creative process, a process that does not apply to the water resource base itself. Furthermore, the common heritage nature of water, as reflected in religious writings and the constitutions of many states, is deeply grounded in most societies. This said, it is equally important to recognise on a pragmatic basis the behavioral incentives associated with private rights. However much we may wish otherwise, people do tend to care more for resources when they have a direct, individual interest in their condition. The inherent contradictions between these elements raise major questions for the way forward. We are faced with a fundamental dilemma involving ethics and behavior.

One potential way out is to further develop and strengthen concepts such as the public trust doctrine, which could serve as a reservoir for community ownership and interests – a counterbalance to private use rights. This approach has, however, encountered substantial obstacles in its application both in the US and other locations in part because trust rights themselves are poorly defined. Public trust concepts might be strengthened and made more implementable if they were combined with an entitlements approach. Entitlements could be developed, as Peter Gleick suggests in his paper written for this conference, by defining a human right of access to specific baseline quantities of water for domestic uses (Gleick, 2001). A similar approach could be followed for environmental values and the remaining resource could then be allocated through a combination of prior appropriation, share and correlative rights concepts. Entitlement and public trust concepts would then be an envelope to bound and limit privately held use rights. The balance between the two conceptual formulations would provide a framework within which the values of different social groups and of individuals could be contested and negotiated. Some of the third party and other negative impacts of water reallocation through market mechanisms could, as Charles Howe proposes, also be reduced through assigning property rights to communities rather than to individuals (Howe, 2001).

HUMAN RIGHTS AND WATER

The discussion above has focused on what I see as the fundamental ethical issues associated with water rights. These ethical issues intersect strongly with questions of the human role in the world and our relationship with resources that form part of our common heritage. The subjects of this meeting, however, are water, human rights and governance. Do the fundamental ethical questions I associate with water rights issues intersect with notions of human rights and, if so, how? My own perspective is that the ethical questions associated with water are as fundamental as the traditional questions concerning human rights, but quite different.

Common conceptions of human rights emphasise freedom (of speech, movement, etc.) and life. Conventional perspectives on human rights violations generally focus on acts of direct commission – torture, genocide, rape and other direct violent violations against individuals or groups. They are rarely associated with acts of omission such as the inability of a government to provide key services, even if such services are essential for life. I worry that calling for access to water *per se* to be viewed as a human right in itself would dilute the concept of human rights. This is what The Economist refers to as the 'perils of inflation' in its leader on the politics of human rights (The Economist, 2001*)*. As it points out. 'The new rights would have to be defined in the vaguest, most general terms if they are to be plausibly universal in scope. These rights will either mean nothing, if they are regarded only as empty platitudes; or, if the intention is to move from stating rights to enforcing laws, they will be constitutionally dangerous' (The Economist, 2001).

Denial of access to water as a direct act of commission could already, as an act of torture or the denial of life be considered a human right violation. This is also the case, for example, with the trauma experienced by populations when displaced by the construction of large dams. These are already part of our existing notions of human rights. Going beyond this and adding access to water for basic needs to the list of human rights would, it seems to me, suggest that the provision of water is a fundamental duty of society and its government. If a government failed in that objective, it could be considered guilty of human right violations. While not denying the responsibility of governments and society in general to provide for the basic needs of citizens, the force of notifying a government or other entity that it is abrogating human rights is directly proportional to the social consensus that such violation goes beyond standards of human decency. Such force is inherent if human rights violations are focused on direct and very violent acts of commission the force becomes diluted if it applies to any of the multiple services for which individuals look to society and governments.

I believe that, access to water should be a basic right or entitlement. This right would be founded on and grow out of the right to life (a human right). Beyond this, there are strong ethical reasons for ensuring that all people maintain a say in what is a common heritage resource. Entitlements combined with public trust concepts could be a vehicle for granting water the status of a human right. Classifying access to water as a human right could, however, be counterproductive if it serves to dilute already socially accepted notions of human rights and human right violations.

TOWARD A BASIC ETHICS FRAMEWORK

Rather than viewing water through the lens of human rights, a basic ethics framework seems to me to be more consistent with broad notions of water rights and their social-historical development.

Drawing on concepts of entitlements and public trust, we could develop a basic ethics framework that would reflect the common heritage nature of water resources. In combination with a bounded notion of private rights (based, perhaps, on correlative rights concepts and existing use patterns) a framework could be created for the on-going negotiation of the tension between public interests and private incentives. This approach would resonate with the two sides of currently accepted practice – high-level notions of commonality combined with *de facto* privately held rights supporting existing use patterns. The issue, for me, is one of frameworks and governance processes for ameliorating the public interest – private incentive tension. In most instances this is quite different from common conceptions of human rights.

NOTES

[1] National Audubon, 658 p. 2d at 718 (quoting J. Inst. 2.1.1)

[2] Equity and other similar issues are a level up from the more basic behavioral question. Many groups agree on the objectives society wishes to achieve through water allocation: environmental sustainability, social equity and economic growth. The divergence often comes about with respect to the mechanisms for achieving these goals and changing human behaviour. Which change human behavior in a manner that achieves more equitable and sustainable outcomes institutional and political processes or economic incentives and market mechanisms?

[3] *Ibid*

[4] Constitution of Colorado, Article XVI: Mining and Irrigation

Section 5. Water of streams public property. The water of every natural stream, not heretofore appropriated, within the state of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the state, subject to appropriation as hereinafter provided.

Section 6. Diverting un-appropriated water priority preferred uses. The right to divert the un-appropriated waters of any natural stream to beneficial uses shall never be denied. Priority of appropriation shall give the better right as between those using the water for the same purpose; but when the waters of any natural stream are not sufficient for the service of all those desiring the use of the same, those using the water for domestic purposes shall have the preference over those claiming for any other purpose, and those using the water for agricultural purposes shall have preference over those using the same for manufacturing purposes.

[5] A good summary comes from the web page of Beachbrowser.com: 'Roman Emperor Justinian, in 530 AD, gathered together his top legal scholars and ordered them to put in writing all of the laws of the Empire. Thus, the 'Institutes of Justinian,' the body of Roman civil law, were written. Tucked away in these numerous volumes covering every aspect of Roman life and commerce, was the provision that 'By the law of nature these things are common to all mankind; the air, running water, the sea, and consequently the shores of the sea.' No one, therefore, was

forbidden to approach the seashore. Over the next millennium, Rome fell and the western European countries rose. But the civil law of Rome, the Institutes, formed the basis of law for many of the European countries. Most important from an American perspective, the law of England adopted much of the Roman civil law, recognising the public nature of tidelands and waters, and giving them protection in the name of the king for the use of all English subjects.'

[6] 'The idea that institutions established for the use of the nation cannot be touched nor modified, even to make them answer their end, because of rights gratuitously supposed in those employed to manage them in trust for the public, may perhaps be a salutary provision against the abuses of a monarch, but is most absurd against the nation itself. Yet our lawyers and priests generally inculcate this doctrine, and suppose that preceding generations held the earth more freely than we do; had a right to impose laws on us, unalterable by ourselves, and that we, in. like manner, can make laws and impose burdens on future generations, which they will have no right to alter; in fine, that the earth belongs to the dead and not the living.' Letter to His Excellency Governor Plumer.11 William Plumer, Governor of New Hampshire, Monticello, July 21, 1816. *The Writings of Thomas Jefferson Volume XV, Letters Written After Return to the United States from 1816 to 1823*.

[7] Main report of the Decentralised Management Study, Taiz, unpublished report for the World Bank, 1997.

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WATER, HUMAN RIGHTS AND GOVERNANCE IN THE MIDDLE EAST: AN ESSAY ILLUSTRATED BY CONFLICTS OVER WATER BETWEEN ISRAELIS AND PALESTINIANS

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ABSTRACT

Fresh water has been a contentious issue in countries to the south and east of the Mediterranean Sea since Biblical times. However, the specific issue of human rights to water has received rather little attention, particularly in comparison with both historic and modern attention to legal rights and governance structures. This paper explores this contradiction using, as an example, the Palestinian-Israeli conflict. It goes on to ask whether the absence of an explicit human rights dimension will persist into the future. The paper is labelled an essay because specific references to the literature and direct evidence are not presented at this time. Rather, this paper should be seen as a work in progress, in which a contentious site of conflict over water is used to illustrate some general points.

INTRODUCTION

Fresh water has been a contentious issue in countries to the south and east of the Mediterranean Sea since Biblical times, and no doubt before. However, the specific issue of human rights to water has received rather little attention, particularly in comparison with both historic and modern attention to legal rights and governance structures. This paper explores this contradiction using, as an example, the Palestinian-Israeli conflict. It goes on to ask whether the absence of an explicit human rights dimension will persist into the future. The paper is labelled an essay. It should be taken as a work in progress in which one of the more contentious sites of conflict over water is used to illustrate some general points. As an essay, it is appropriate to indicate where this paper is heading. It offers three main conclusions.

The first conclusion is that the contradiction is more apparent than real. Human rights to drinking water have always been assumed – and most of the time, met – throughout the Middle East and by all religious faiths. Drinking water, however, represents only a small share of the total water use in the region. The major disputes, historically and

currently, involve water for agriculture, mainly irrigation and livestock watering. Therefore, the major focus for law, even in Biblical times, has been on water for agricultural uses. Agricultural water is not only more oriented to commerce than to survival, but is also more dependent on the nuances of a managed system, hence the focus on legalities and governance as opposed to human rights. At the same time, agricultural water is clearly less subject to religious law than drinking water is and what might have become sources of economic conflict in recent years have been suppressed – in Palestine by military occupation; on the Nile by a strong downstream riparian; and on the Euphrates by a strong upstream riparian.

The second conclusion is that the contradiction is apt to become sharper in the future, though not so sharp as to lead to military conflict. With continuing economic and demographic growth throughout the Middle East, consumption patterns for water are at least among urban people and the growing middle class, tending toward northern models. As a result, the availability of fresh water for agricultural purposes will gradually decline to small amounts for high-value crops and vegetables eaten raw. With the bulk of fresh water going to households, the focus of political attention must shift from the supply side to the demand side, and human rights issues will have to be raised. Furthermore, such human rights will, more explicitly than in the past, be defined in terms of quality as well as quantity.

Third, in part because of the growing recognition of economy-ecology linkages, and even more because of concern for sustainable development, ecological rights will take their place along side human rights in determining how to share the limited natural supplies of fresh water in the region. 'Red lines' will be drawn to establish limits to pumping from aquifers or lakes, and minimum river flows will be established to protect not merely quantifiable benefits, such as fishing and waste disposal, but also non-quantifiable (or at least less easily quantifiable) benefits, such as habitat preservation and aesthetics.

Though illustrated within the specific context of conflicts over water in the Jordan Basin, these three conclusions are likely a precursor of conditions that will become general throughout the Maghreb and the Mashrek.

FRESH WATER IN THE MIDDLE EAST AND IN MIDDLE EASTERN RELIGIONS

Few generalisations hold over large distances or much time in the Middle East, but two can be made. First, water is in short supply and availability has always had a major influence on development: a limitation where it is particularly scant; a spur where it has been more plentiful. Second, the region has been the spawning area for major religious movements, and those movements have also influenced the strength and the character of development and of attitudes towards water.

The first statement above is perhaps obvious, though the role of water is often misunderstood. The whole area is semi-arid at best, with rainfall that, apart from areas right along the coast or high in the mountains, rarely exceeds 500 mm per year. However, low rainfall is not the main problem for development. The main problem is the unpredictability of that rainfall. Low rainfall is something around which one can plan, just as one can plan for the fairly regular variations in rainfall from one place to another and from one month to another. However, much if not all of the Middle East is subject to wide variations of rainfall from year to year–from a year where rainfall is dramatically above long-term averages, to one where it is dramatically below those averages; from years of flood to years of drought, or, worse yet, from a series of flood years to a series of drought years. Such capricious fluctuation makes planning very difficult, for averages are little more than a mathematical result with almost no predictive value.

Novels and movies set in the Middle East emphasise the shortage of drinking water, and of course drinking water is critical for human life, and on oceasions people do die of thirst. However, the major use of water in the Middle East is not for drinking but for growing crops and watering livestock. Even in the most advanced countries with large urban areas and industrial sectors, more than half of the fresh water used is for irrigation; in the less industrialised and urbanised countries, its figure can go as high as 90 per cent. Perhaps the first recorded statement of ecological carrying capacity appears in the Hebrew Bible in Genesis 13:6, where Abraham and Lot had to move in different directions because of the size of their flocks: 'And the land was not able to bear them, that they might dwell together; for their substance was great, so that they could not dwell together.'

This brings us to the second statement, which again may seem obvious, but not necessarily in an important sense for our purposes. Three great world religions emerged from the Middle East Judaism, Christianity and Islam. And each brought forth a large literature capped (or, more accurately, initiated) by one great book: the Hebrew Bible, the Christian Bible, and the Quran. The Hebrew Bible and the Quran in particular are filled with references to water, and, in a more or less direct way, those references created a body of religious law called *Halachah* (the way) for Jews and *Sha'aria* for Muslims that determined how water was and was not to be used. That law was not merely oriented toward normal conditions; it also went on to regulate use during droughts and to mitigate conflicts over water. It is that Jewish and Islamic religious law that has broadly governed, and that continues to guide if not govern, the use of water in the region.

THE PAST

The past in the Middle East goes back a very long way indeed. It is doubtful if rainfall measures are so carefully kept anywhere else in the world. Even the timing of religious

holidays can be keyed into expectations of rainfall. Biblically, there is almost no record of conflict over surfacewater, though there are numerous examples of (rather local) conflicts over the possession or use of wells. However, there is little record of large areas of thirst occasioned by the refusal of one group to allow access to water to another. Even after years of drought, the emphasis is on the effects on crops, not on the effects on human beings.

By and large, religious principles or perhaps they were principles that simply emerged from the humanity of human beings insisted that drinking water had to be provided, at least to the extent required for life itself and, in practice, rather beyond that minimum.

The imperative to provide drinking water as a human right is all the more impressive when one recognises that the Middle East has always been one of the more urbanised areas of the world. This means that, apart from those cities located beside a large river, water has to be brought into a city. Some of the most ingenious engineering feats of antiquity were devised to bring fresh water to cities and, no less importantly, to carry off their wastewater. The *qanats* that conveyed water from mountain springs to cities such as Palmyra in Syria were models that were replicated across the region. Not surprisingly, the dividing weirs for those *qanats* are commonly located within mosques and in some cases the chambers with the weirs served double duty as a cool spot where local people (or more likely, men) could gather and gossip.

Only in times of warfare were water supplies to cities in jeopardy, and, even then, there were mitigating factors. Again, remarkable engineering can be found, as with the tunnel that took advantage of karstic passages to redirect the flow of the Gihon spring located outside Jerusalem's walls back under the walls and into the city or with the use of animal skins to cover and tap submarine springs located just offshore at Sor (Tyre) in Lebanon. However, other mitigating factors originated from religious law, which insisted on the obligation to provide drinking water to people in besieged cities. As a result, most passages written from within such cities refer to starvation, not to thirst.

The Crusaders of course changed all this. They had not a shred of respect for *Halachah* or *Sha'aria*, much less for local inhabitants, whether Jew or Moslem. Though cities in the region had traditionally been walled and built on heights, these barriers were aimed more at keeping out marauding desert tribes or collecting taxes at the gates than at creating a true barrier to invading armies. No doubt it was also cooler and more healthful to live on the top of a hill. It was the Crusaders, not local people, who built towering castles on impregnable heights. These castles were devoid of internal sources of water, so huge cisterns were built, and it was against these castles that full siege, including a cutoff of water supplies, became the preferred way to conduct warfare.

If religious law concerning drinking water was relatively simple, this was not the case for agricultural water. A large and complex body of law grew to mediate and moderate the use of water for agriculture. Indeed, as Islam and Judaism (and much less so

Christianity) evolved toward becoming more a continuing way of life than a periodic religious practice, it became essential for religious law to concern itself with issues of how to distribute and use water for agricultural and pastoral uses. The law has many elements of equity, but it is also aimed – perhaps even more so at efficiency of water use and at protection against pollution. As the authority of states began to replace that of bodies religious authorities, these laws came to be absorbed into the general body of governance institutions. Of course, religion being religion had one card that no state could trump: it incorporated some circular causality. Notably, one of the main rewards that is promised from full and careful observance of religious law is adequate rainfall, in the right seasons and in the right amounts (statements clearly linked to harvests, not drinking water). The very fact that it rains is the evidence that the religious superstructure is firmly in place and delivering on its promises.

However, the laws to guide agricultural use of water, based though they might have been on religious principles, and couched though they might have been in equity, never carried the moral force that laws for drinking water did, and they could not prevent a gradual but distinct class structure from emerging, with the upper, ruling classes having not only an adequate share of household water but the dominant share of agricultural water. Lower classes were left with enough water to maintain life and to water a few animals, but not much more. Human rights to water were, in effect, defined in terms of the ability to continue to survive but not to accumulate a surplus.

THE PRESENT

The past is strongly reflected in the present. Despite the turbulent history of the Middle East in the past few decades, the ancient patterns of water distribution have remained. Some attempt has been made to assure adequate supplies of drinking water but the bulk of civil law and the class structure, going back to control agricultural water.

A remarkably large number of people have written or said, or are alleged to have said, that water has been a cause of war, notably the 1967 war between Israel and the forces of the surrounding nations who supported the Palestinians. Even more have argued that water will cause the next war in the Middle East. However, the evidence for either assertion is remarkably thin. Careful analysis of events in the 1967 war shows that Israel's dramatically improved hydrological position after the war was more the result than the aim of the war. If Israel did take its hydrological position into consideration, it was only in the last day or two of the war, not prior to it. No evidence exists to show that Israel's early strategy was aimed at securing fresh water.

The absence of direct international conflict over water is more a rule than an exception around the world. Aaron Wolf and his colleagues at the University of Oregon

have analysed all alleged conflicts over water, and they have identified only seven minor international skirmishes in the last 200 years, and only four of these involved shots (Wolf, 1998). Moreover, in almost every case, it was the border that was in dispute, rather than the water itself; the border merely happened to lie along a river. In contrast, in the last century alone, some 150 international treaties on water have been signed, and this excludes those involving boundaries or fishing rights. International waters seem to be a catalyst for co-operation and even collaboration rather than a source of conflict. This is not to say that fresh water will not be a source of conflict. However, the bulk of the conflicts to come (and there will be many) are more likely to be local, or between the urban and rural areas of one nation, than to be between nations. As shown by Homer-Dixon and his colleagues (Homer-Dixon, 1991,1994,1999), such conflicts can be very disruptive but they are more apt to be resolved by elections or court decisions than by military action. Nor is this to imply that water systems will not suffer during conflicts over other issues. Water losses in Beirut for example went up from 40 per cent to well over 60 per cent during the 15 years of civil strife, and almost the entire system for hydrological measurement in the southern part of the nation was destroyed.

The Arab-Israeli conflict is a good illustration of how nations manage water conflicts. The peace treaty with Jordan has a long annex that is almost a model of how to manage water. This is not to say that the specific shares are necessarily equitable, but the focus on joint management of shared water and on unified treatment of supply and demand and of quantity and quality is remarkable. The Syrian track is equally free of significant disputes over water (though water is often used as an easy excuse to terminate discussions), and the lines of compromise (once Israel returns the Golan Heights) have long since been worked out. The situation between Israel and Palestine is more complex because their hydro-geology is not merely shared but intimately inter-linked. Even here, however, joint teams of Israeli and Palestinians researchers have been at work designing systems for joint management of the single most valuable and hence most contentious body of water, the Mountain Aquifer. True, this is just a research project, but, in this part of the world, research is never free from politics, and in many cases the same people who research the options will later, wearing different hats, negotiate the agreements (or sit behind those who do).

Moreover, with rare exceptions, mainly linked to road closures, water has not been used as a weapon by the Israeli occupation forces against Palestinian villages. Regular reports by a Palestinian group during the current phase of the Intifada show that past policies continue and that, though water shortages do occur, they are temporary. Indeed, the one area where relationships seem to be more or less normal during this Second Intifada is water. According to well-informed sources, in January 2001, not long after the start of Second Intifada, Israeli and Palestinian signed (in the presence of American officials) a formal joint declaration to declare that water and sewage systems would not be

targets of violence. To the best of my knowledge, this agreement has been substantially honoured by both sides, though villages served only by water tankers are commonly deprived of supplies during periods of violence or of military operations. One has to assume that Israel's invasion of the West Bank following the *Passover* suicide bombing in Natanya has damaged infrastructure in Palestinian cities, but little information is available to indicate the extent of the damage.

None of the foregoing statements should be read as saying that water supplies, even drinking water supplies, are equal for Israelis and Palestinians. The infrastructure, which brings water to the West Bank and Gaza is far more limited in capacity and far more open to pollutants than is that which supply Israeli citizens. The city of Hebron and some communities in northwestern Palestine have been chronically short of piped drinking water. Even Palestinian villages within pre-1967 Israel have second-class water systems compared with those of Jewish communities and some still lack sewage systems.

However, the real differences between water in Israel and in Palestine, and the source of the greatest differences in rates of per capita consumption, do not derive from drinking water supplies or use but from agricultural water. If Israel has not used water for household consumption as a weapon, it has systematically deprived Palestinians of agricultural water, which of course they need for economic growth and even basic livelihoods. (The Palestinian economy is roughly seven times more dependent on agriculture than the Israeli.) Israel policy was most forcefully if not legally stated by a former Water Commissioner, who, to paraphrase, declared in the late 1980s that if the Palestinians ask for water to drink, the Israel would and indeed had to respond, but that Israel had no intention of turning off the taps of their own irrigation wells so that the Palestinians could irrigate their fields. Nevertheless, the pattern remains as before, with a strong sense of a human right to household water, but with agricultural water subject to the influence of power, whether military or economic. In fact, of all the nations in the Middle East, Israel probably has the most highly developed body of water law and it clearly hinges on two opposing factors: the economics of water, which lean toward charging farmers higher prices if not marginal costs (backed analytically by most of the academic community); and the power structure reflected in the powerful water-agricultural lobby (backed emotionally by the old Zionist image of making the desert bloom). In recent years, economics have prevailed over politics and ideology.

THE FUTURE

Finally, we must look ahead to ask whether the conditions that we have identified to now are going to persist. Will the future, the relatively near-term future, meaning the first quarter of the new millennium, reflect the conditions of the past? My answer is that it will

and it will not. It will in the sense that international conflicts over water are unlikely to break out, though water will continue to be a highly contentious issue within national and local politics. It will not in the sense that increasingly water demands will be coming from the non-agricultural sectors of society, mainly for urban uses, but also for industry and for ecological purposes (Postel and Wolf, 2001).

Models for future developments in the Middle East exhibit two dangerously conflicting trends. Demographic and economic projections show an increasingly large, and, compared with world averages, reasonably well off, urbanised population. On the other hand, if there is one point of consensus in global climate models, it is that the Middle East and North Africa will experience lower average rainfall and more drought years in the future compared with their already low-rainfall and droughty past.

As a result of these trends, by about the end of the first quarter of this millennium, many if not most nations in the region will have little if any fresh water available for agriculture. All water will be required for domestic purposes. All of the proposed alternative sources, such as desalination or long-distance transport are expensive, but not unreasonable for drinking water; they are however, much too costly for agricultural water. Simple multiplication of the population by various standards for the use of domestic water, generally taken as around 50 litres per person per day for 'basic water requirement for human domestic needs,' shows that agricultural water will be squeezed out. Not all of this household water needs be potable, but, according to the allocation suggested by Gleick, about 30 per cent of it must be (Gleick, 2000). A larger figure of 325 litres per person per day has been suggested by Shuval and others to allow for home gardens, which could provide a minimal quantity of food or a few marketable commodities (Shuval, 1992). Again, the added quantity need not be of the same quality as drinking water.

The suggestion that larger and larger proportions of the regional water supplies will have to be devoted to domestic uses rather than to growing food is fully consistent with, but not dependent upon, analytical studies of what Allen (1997) and his colleagues call the trade in 'virtual water.' That is, they argue that Middle Eastern economies would be stronger if they imported water by the simple expedient of importing food, rather than, as at present, trying to maintain an export base in agriculture. (As a rough mnemonic, it takes roughly 1000 times as much water to grow the food we need to eat as to provide the water we need to drink.) Such arguments offer important support, but are not central to the argument being made here, which is simply that water will increasingly be subject to concerns related more to human rights than to economic allocation.

Moreover, an additional demand is now being included in water balance tables: the ecological requirement for water in place Bos and Bergkamp (2001) list the ecological functions provided by water as follows: regulatory functions for essential ecological processes and life support systems, habitat functions to maintain biological and genetic diversity,

production functions for food, fiber, shelter and other resources and information, aesthetic and spiritual functions. None of these can be directly measured, and even the use of surrogate measures is fraught with problems. No more than any other demand, is the ecological demand fixed and irreducible. However, it cannot be maintained below various 'redlines' for long without losing many of the ecological services provided by water.

Water quality in the region is also being seriously degraded by losses of natural habitat as a result of decisions to drain swamps, canalise rivers or expand urban or agricultural land. Moreover, there are interactions between apparently ecological values and economic ones. Reclamation of land to expand urban space or for agriculture can block natural drainage, increase the salinity of groundwater, and destroy fishing grounds, to name just a few impacts. Agricultural runoff is the main non-point source of water pollution in the Middle East. (Per hectare rates of pesticide and fertiliser use in the region are among the highest in the world.) As one result, over the past two decades, nitrate concentrations in the Coastal Aquifer underlying Israel and Gaza (from both fertilizers and the re-use of sewage effluent) have doubled and some 10 thousand cubic meters of water per year that is too polluted even for agricultural use has been lost. In Syria, Al-Sin Lake, the main coastal source of fresh water, is polluted by runoff. The King Talal reservoir is too polluted for recreational use, but as the only standing body of water in Jordan, this pollution carries an extraordinary opportunity cost. Practices such as conservation tillage, contour planting, terracing and filter systems, among others, can control soil erosion and reduce phosphorous and nitrogen run-off by up to 60 per cent.

Water in place and the habitats for plants and animals that it supports have values. Some of these values as with fisheries and hydro-power, can be measured in conventional economic terms. Other value partially calculable, as with recreation or the dilution of wastes. Finally, in situ water supports values like the regulation of river flows and ecological balance that are difficult to capture in economic terms.

There are few measurements of the volume of water required for ecological services. Arlosoroff has suggested that in Israel the minimum is about 31 million cubic metres of water per year (personal communication), but of course this does not include the amounts stored in aquifers or in *Kinneret*.

CONCLUSION

The analysis presented in this essay suggests that human rights to household water, coupled with ecological rights to environmental water, will play a greater role in the future than they have in the past. The legal structure for agricultural water will increasingly be devoted to systems for managing recycled or reclaimed water, or for using saline water. Those systems will be subject to close regulation to ensure that environmental trade-offs

are fully analysed and that acceptable losses, quantifiable or not, are recognised. However, human rights to water are both simple and difficult to establish. It is simple enough to set a minimum basic standard, such as 50 liters per person per day, but very difficult to make that standard operational. In such circumstances, both human and ecological rights will probably be better kept out of the legal system and be made part of the administrative structure for water management. In this way, they can (together with appropriate water quality criteria) be treated as 'standards' or, more forcefully, 'entitlements' for which administrative bodies are responsible and against which their performance can be measured. Moreover, delivery of supply could be made conditional upon appropriate conservation measures being in place and prices for water (again adjusted for quality) keyed to the standard quantities. Much the same approach can be taken, and has been taken, for ecological water, particularly that portion for which economic valuation is most difficult. Of course, the calculation of ecological standards will be more difficult, which is to say subject to more difficult concepts of opportunity costs but still within the capability of modern methods. What remains to be done, and what is still more difficult to do, is to determine how these standards can vary and over what time frames, during period of drought. Reserve supplies (either in aquifers left un-pumped in normal years or in agricultural uses that can be withdrawn when needed) and water banking can play a role. In some cases, one can rely on ecological resilience, which, as desert terrain has demonstrated over millennia, is enormous.

What is mainly needed, then, is the political courage to accept the need for this approach, and the administrative structure to put it into place well ahead of, not at the time of, conflicts and shortages. The principles are there in religious law, and many of the practices can be derived from the ancient systems of the Nabatean farmers or the Palmyran urban dwellers. To be applied they merely need modern institutions.

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WATER, HUMAN RIGHTS, AND ECONOMIC INSTRUMENTS THE ISLAMIC PERSPECTIVE

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ABSTRACT

The countries of Middle East and North African (MENA) region has one of the highest average population growth rates in the world as well as scarce natural water supplies. This paper looks at the challenges of water management in the region by exploring various conceptual strands that have evolved in the discourses around water from an Islamic perspective. Islamic percepts allow the functoning of free and fair markets for water but governments need to intervene if the principles of equity and public interest are being contravened.

INTRODUCTION

In the Middle East and North Africa (MENA),[1] water is the key development issue. The region has one of the highest average population growth rates in the world (around 2.8 per cent) as well as scarce natural water supplies. As a result, the average renewable fresh water availability in the region has dropped to about 1433 m^3/p/y and many countries in the region fall well short of that. For example, the annual renewable fresh water available per person in Jordan, Tunisia, and Yemen was 148, 434, and 241 m^3 respectively, and these values are projected to drop drastically by the year 2025 (World Bank, 2001). In addition, the quality of the limited water available is diminishing because of increasing pollution and over-pumping. A benchmark level of 1000 m^3/p/y is often used as an indicator of water scarcity: below this, a country is likely to experience chronic water scarcity on a scale sufficient to obstruct development and harm human health (Falkenmark and Lindh, 1974). A supply under 500 m^3 per annum, as in the case of Jordan, Tunisia and Yemen indicates severe water stress.

Competing water demands are exacerbated by high population growth rates and rapid urbanisation. Although the collective urban growth rate of less developed countries (LDCs) is estimated to be 2.9 per cent for the period 1995-2015, it is even higher in MENA countries (3.2 per cent). By 2015, the percentage of the total population living in urban areas in MENA will be 66 per cent compared to 49 per cent for LDCs as a whole (UNDP, 2000).

The high urban growth rate has lead to the rapid expansion of informal settlements in and around cities all over MENA. Few of these urban or peri-urban communities receive water and wastewater services, either because the communities were poorly planned or because of legal or political restrictions imposed on public utilities. About 17 per cent of the population in MENA was without access to safe water between 1990 and 1998, and close to 37 per cent was without access to sanitation during the same period (UNDP, 2000). Many spontaneous settlements of residents rely on informal supplies of water sold by private vendors. On average, these families pay 10-20 times more per litre of water than do residents who receive piped water service; in some municipalities the cost is 80-100 times more (Bhatia and Falkenmark, 1993). Very little data is available for prices paid by the unserved peri-urban poor in the Middle East. However, during the exceptionally warm summer of 1998, the city of Amman in Jordan suffered a severe water shortage. The public was forced to buy water from vendors and the black-market price of water delivered by truck tankers reached US$ 14 per m^3 (Bino and Al-Beiruti, 1998). This is 28 times the price of US$ 0.50 per m^3 normally paid for Amman's drinking water and sanitation services. Under most conditions, US$ 2 per m^3 is greater than the maximum theoretical price for municipal water services by the cost of desalinating seawater and distributing it.

Against this backdrop, governments, non-governmental organisations (NGOs), and donor organisations, including IDRC, are debating means to meet the challenge to provide water in an equitable way. A number of principles have become accepted as being essential for sustainable and equitable water management, including dealing with water issues in an integrated way, and ensuring that women assume a central role in water management policies. At the heart of water management debates are two views often seen as conflicting: some argue water is a social good while others claim it is an economic good. This paper examines whether, from an Islamic perspective,[2] water can be considered a fundamental human right, as well as Islamic perspective on alternative approaches to governance that could evolve from viewing water as an economic good.

The remainder of this paper is organised as follows: First, to set the context, the idea that water is a social good; the evolution of the principles that have led to the inclusion of water as a fundamental human right is discussed. This is followed by a discussion of water as an economic good and the potential governance mechanisms that can arise from such a viewpoint, which include privatisation and internal and international water markets. The remainder of the paper will present the Islamic perspective on the debate over whether water is a social good or an economic one and explore whether these seemingly contradictory ideas can be consolidated.

FROM 'WATER IS A SOCIAL GOOD' TO 'WATER IS A HUMAN RIGHT'

Everyone agrees that water is a vital resource to which everyone has a right because it gives and sustains life. This principle is always the first espoused in every water policy and at every water conference. It was coined very simply at the 1992 Dublin Conference as 'water is a social good', and was reiterated in the World Water Vision for 2025 presented at the Second World Water Forum in the Hague in March 2000: 'Everyone has access to safe water supply (and)…people come first'.[3]

Given that in many developing countries the level of access to safe water and sanitation is even worse than the figures presented for MENA, many feel that well-meaning statements in water policy white papers or in the declarations following conferences do not go far enough. Water has been described as a basic human need in both the policy statements of developing countries and the programming of donor agencies for several decades, yet severe inequities persist. Therefore, more and more observers are suggesting that access to safe water is a fundamental human right based upon the wording of Universal Declaration of Human Rights and the Convention on the Rights of the Child,[4] and that all states should back up these conventions by enacting and enforcing legislation that protect water rights in their jurisdictions. In theory, the advantage of using formal legal language (i.e. rights) when speaking of access to safe water means that states which do not provide such services to all, regardless of class, ethnicity, or gender, should suffer international condemnation and trade penalties, and that the unserved can demand redress in the courts.

In practice, judging whether or not someone has access to water requires applying more detailed definition. Lundqvist and Gleick suggested that a basic water requirement covering all domestic needs, including drinking, washing and cooking, should be a minimum of 50 lpcd (Lundqvist and Gleick, 1997). South Africa's White Paper on Water Policy in 1997 guaranteed 25 lpcd as a basis for South Africa's New Water Law and as a right for all of its citizens.[5] Most recently, the World Water Vision called for 40 lpcd of safe and affordable water, as well as for access to a latrine and to hygiene education.[6]

WATER IS AN ECONOMIC GOOD

The 1992 Dublin Water Conference described water as a social good, and then in the next breath also described it as an economic good. This was very recently confirmed in the World Water Vision, which calls for moving towards full-cost pricing with targeted and transparent subsidies for the poor.[7] The intent was that water be priced at a level that makes people use it sparingly. Charging for water will conserve it, ensuring that more is available to go around, generate enough funds to properly operate and maintain existing water infrastructure, and ensure that additional investments in water infrastructure can be made so that coverage can be extended to the unserved poor.

For several reasons the idea that water is an economic good is controversial. Many advocates for the poor feel that because water is a vital social need, governments should provide the poor with water for free or at a great discount. However a greater controversy arises from the potential for this principle to lead to controversial alternative governance systems relating to water, such as the privatisation of utilities, water markets, and bulk water transport across watersheds. Many observers see an inherent contradiction between the idea that water is a fundamental human right and social good and the potential for it to be allocated, like any other commodity, only to those who can afford it. Barlow, whose views are summarised below, captures these fears in a comprehensive discussion.[8]

Barlow argues that driven by economic globalisation considering water to be an economic good is leading to the 'commodification' of the world's water supply and that this is pushing us down a slippery slope that will lead to greater inequities as water supplies flow to the highest bidder. She maintains that the economic globalisation envisaged by transnational corporations that are pressuring national governments to privatise, deregulate, and relinquish state controls is pushing us to 'a single global economy with universal rules set by corporations and financial markets' in which everything, even vital public goods such as cultural heritage, seeds, and natural resources such as water, is for sale.

Barlow fears that privatisation leads to higher prices for consumers, noting that water prices in France are 50 per cent higher after privatisation than they were before. Furthermore, she feels that public-private partnerships are only the first step towards full privatisation and that once water is seen as a commodity, water will flow towards rich corporations and cities that can afford them and away from the poor. She writes that 'when water is privatised, prices are set on the open market. As a result, millions of poor people have been cut off' [9] and notes that while the government cut water supplies to local farmers during a 1995 drought in northern Mexico; it provided emergency supplies to the mostly foreign-controlled industries of the region.

Finally, Barlow observes that many of the private firms involved in running systems are also interested in bulk water exports and thus are hoping for full privatisation. She indicates that recent trade agreements such as the NAFTA (North American Free Trade Agreement) and the General Agreement on Tariffs and Trade (GATT) do not exempt water, so that if bulk water exports were to commence among NAFTA countries the tap couldn't be turned off even if it became clear that such water exports were harmful to the environment. She dismisses the claim that bulk water exports are too expensive as a myth and notes that in recent cases brought before the World Trade Organisation, the WTO has upheld the rights of commerce over the rights of environmental protection.

ISLAM ENTERS THE DEBATE

Many of the critics of water pricing, privatisation, and markets have indicated that a human rights based approach and a market-based approach cannot coexist in predominantly Muslim nations. This is based upon the persistent notion that water cannot be bought or sold in Islam.[10] Some Muslims have said, before and after the Dublin Conference, that Islam is against selling water, and these arguments have been circulated in the literature. For example 'Iskandarani writes there are religions (for example Islam) that prohibit water allocation by market forces…' (Webb, 1998).

On the surface, it appears that the Webb and Iskandarani statement is a confirmation of a theme currently in vogue in development literature: that there is a major conflict between globalisation and local values. This idea is neatly summed up by the title of Thomas Friedman's book 'The Lexus and the Olive Tree', a metaphor of the contradiction between globalisation (or the market) and fundamentalism (or traditional or local values). While there is no question that the two forces are in conflict, the contradiction is sometimes too hastily assumed. It is instructive to take a deeper look at what Islam actually says about water, human rights, and the market.

WATER AS A SOCIAL GOOD IN ISLAM[11]

This section outlines the importance of water in Islam, the central need to protect equity and the rights of the environment. It culminates in a discussion of the possibility of considering water to be a fundamental human right in Islam.

In Islam, water is of profound importance. In the Quran,[12] the Arabic word for water, *ma*, occurs 63 times, paradise is described as 'gardens beneath which rivers flow',[13] and water is described as a blessing from God that gives and sustains life,[14] and purifies humankind and the earth.

All human beings rely on water for life and good health but, for Muslims, it enjoys special importance for its use in *wudu* or ablution before praying. Daily prayers, one of the five pillars of Islam, have themselves been compared by the prophet Muhammad (pbuh[15]) to the cleansing action of water in a *hadith of maxim*: 'The similitude of five prayers is like an overflowing river passing by the gate of one of you in which he washes five times daily'.[16]

Virtually all of the prophet Muhammad's *hadith* on the subject of water relate to equity. For example, Muslims are advised that they do not truly have faith unless they wish for each other what they wish for themselves.[17] Obviously, this applies as much to the desire for clean, fresh water, as to anything else. Furthermore, among those who will be ignored by God on the Day of Judgment are they who withheld superfluous water from a thirsty traveller.[18]

The Quran warns human beings against unfair distribution by stating that worldly riches belong as much to orphans, the needy, and the wayfarer, as they do to anyone else.[19] In fact, the recognition of water as a vital resource, to which everyone has the right of a fair share, is emphasised by *hadith*.[20] On the prophet's advice, one of his companions, Othman, who later became the third Muslim caliph, bought the well of Ruma (a settlement in Arabia) and turned it into a *waqf*, a collective property for religious purposes and public use; this meant that the community could use its water for free.

As in Christianity and Judaism, in Islam humankind has the first right to the resources that God has provided his creations. It is well accepted by Islamic scholars (Mallat, 1995) that the priority of water-use rights is first, *haq al shafa* or (*shirb*) the law of thirst or the right for humans to then quench thirst second, *haq al shafa* the right of cattle and household animals; and, third the right of irrigation. However, as discussed later, the environment is also accorded clear and unmistakable rights by Islam.

While the *Quran* makes it clear that humans have first right to resources including water, it also makes clear that all life, including humans, animals, and plants, should receive water according to its needs. Muslims believe that there is a reward for serving water to any animate (living being).[21] Animals cannot be allowed to die of thirst, and the water that remains after humans have quenched their thirst must be given to them.[22] The Quran notes that the gift of water is for flora as well: 'vegetation of all kinds'[23] and of 'various colours'[24] is nourished by the rainwater that God sends down. These verses support the statement that water is made available by God so that all life including humans, animals, and plants receives support according to its needs (Yusuf Ali, 1977). Non-human species have rights to sufficient water that is of 'good' quality because the water has to be suitable for 'nourishing vegetation' and for animals to drink.[25]

On the basis of these strong statements, it is evident that the fundamental human right to an adequate amount of fresh water is strongly supported by the two primary Islamic sources, the Quran and the *hadith*. Given that these two sources form the basis for *sharia*, or Islamic law, a specific law enacted for the purpose of guaranteeing the fulfilment of basic water requirements to all would have very strong specific support in Islam. Furthermore, given that the environment has clear rights, a basic water requirement or allowance to protect the environment, such as one for 'in-stream'use, also has support, as long as basic human needs were met first.

ECONOMIC WATER MANAGEMENT INSTRUMENTS IN ISLAM

In this section the opportunity granted in to use economic instruments in Islam is explored, first by outlining the support for water conservation in Islam and then by moving on to water rights and ownership in Islam including tariffs, public private-partnerships and finally water markets.

Water conservation

The primary rationale for viewing water as an economic instrument is to support conservation, so it is instructive to examine the Islamic perspective on the management of demands for water.

Given that water is considered so precious in Islam, which emerged in an arid area, it is no surprise that it strongly encourages economising practices in water use. The Quran makes two explicit statements that support water demand management. In short, the Quran first affirms the finite nature of the global water supply, and second, it emphasises that water should not be wasted. The Quran then tells humans that they may use God's gifts for their sustenance, but that they should eat and drink in moderation and not waste excess amounts because God does not favour those who waste.[26] The writings of the *hadith* are even more explicit: the prophet Mohammad used to wash himself before prayer using less than one litre of water and bathe with less than 3.5 litres of water.[27] This *hadith* demonstrates the logical approach to sustainable water use in arid Arabia where the Prophet lived. However, the Prophet forbade waste even in conditions of seeming plenty when he told his followers not to waste water even if they were washing themselves on the banks of a large river.[28]

Water rights and 'Ownership' in Islam

It has been demonstrated that water is of profound importance in Islam and that it must be distributed fairly amongst all of God's creatures and used sparingly. Does this preclude using economic instruments to manage it? There is no point in examining any economic instruments or alternative institutional arrangements if water cannot be sold in Islam, or if the costs of providing it cannot be recovered.

In Islam, water is considered a gift from God, so no individual literally owns it. Humans are the stewards of water and other common resources that belong to the community. However, most Islamic scholars have concluded that individuals or groups have the clear right to use, sell, and recover the value-added costs of most categories of water. These judgements are based primarily on two *hadith*. First, 'It is better ... to go to the woods, cut and sell lumber to feed himself ... than to beg people for help,'[29] which implies that common property resources such as wood and water can be sold and traded (Zouhaili, 1992). Second, the earlier cited *hadith* about Othman's purchase of the well at Ruma proves that wells can be owned and traded. Based upon these and other sources, water is categorised in Islam as follows (Sabeq, 1981; Zouhaili, 1992):

Private Property (water in private reservoirs, treatment plants, and distribution systems) This is water which has been obtained by investing knowledge, infrastructure, and work. The 'owner' of the 'container' has the right to use, trade, or sell water as long as according to another *hadith*, by doing so, she does not harm the rights of others.[30]

Restricted Private Property (lakes, streams, and springs located in private lands): The owner of the land has special rights over others, but also has certain obligations to them. The owner can trade water like any other good as long as, by doing so, she/he does not harm the rights of others.

Public Property (water in lakes, rivers, and aquifers located in public lands). Water in its natural state cannot be sold. However, if anyone invests infrastructure and knowledge to withdraw it for instance, a water utility constructs a supply, treatment, and distribution system to convey it to people's homes that person has the right to recover its costs. Because of the growing scarcity of water in MENA, large volumes of fresh water in its natural state are becoming less and less common.

In his time, the Prophet Muhammad (pbuh) discouraged the selling of water, and even '...forbade the sale of excess water'.[31] Also, as noted, he encouraged Othman to buy the well at Ruma and give away its water. These examples reflect the Prophet's desire for the poor to have access to wells controlled by the rich and powerful. This policy made sense at that time because water, even though it was scarce, was plentiful, clean, and accessible (through hand-dug wells in shallow aquifers) for sufficient amounts to be made available to the very small population in the Arabian Peninsula in the seventh century with almost no provision cost.

However, it is counter-productive to use this tradition to oppose cost-recovery for water services in the current context. In fact, the practice of supplying (almost) free water, under today's conditions of polluted and scarce water supplies has resulted in severe inequities. Subsidizing the collection, treatment, storage, and distribution of water means that increasingly indebted public utilities and governments are able to provide (almost) free water only to the urban rich and middle class. The unserved poor, the very group the Prophet wished to protect, often pay immorally high prices for water in informal markets, or receive water of very poor quality.

In Islam, maintaining principles, such as social justice, that are independent of time or space, is important. As long as the actual policies in place are aimed at achieving objectives, which do not contradict Islam, they themselves can vary according to local conditions. This point is illustrated by recent policy changes in Saudi Arabia, which bases all its laws on *sharia*. Until about 20 years ago, the nation had both ample water and immense wealth, as well as a small population. Following the prophet's (and Othman's) example, it provided its citizens with domestic water nearly free of cost. Conditions have changed over the last 20 years, exacerbated by government subsidisation of wheat production with cheap irrigation water, which resulted in the mining of fossil water. The government has now largely reversed its policy, and the kingdom introduced new water tariffs in 1994 'to acquaint its citizens with the cost of providing water services'.[32]

Water tariffs

From this example one can conclude that Saudi Arabia has interpreted *sharia* in a way that the recovery of costs via water tariffs is acceptable in Islam. But what is a fair tariff? According to Islam, a fair tariff will lead to greater equity across society. Given the crucial need to conserve water in MENA, public awareness and education strategies can only be one element of a multi-pronged water demand management strategy. They must be complemented by economic incentives. Djebbar[33] notes that the price elasticity of demand in LDCs averages -0.45 (higher in rural areas and lower in urban areas), meaning that, all else being equal, a 10 per cent increase in the price of water will lead to a 4.5 per cent reduction in demand. There is ample room to raise prices for the served middle and high classes. Urban water rates in LDCs are typically less than one-sixth the full cost of water provision (Bronsro, 1998). The actual full cost of providing water services varies from country to country, but, in Israel – the only country in MENA where water is charged at full cost in urban areas – the cost is US$ 1.00 per m^3, including a surcharge for wastewater treatment (Shuval, as cited in Lundqvist and Gleick, 1997).

Nothing in Islam prevents a utility from structuring its tariff so that it can recover all of its costs. In fact, considering Islam's concern for the protection of the environment, a fair price should also include the cost of treating wastewater that arises from water use.

In Iran where the law is based upon *sharia*, irrigation water must be sold on the basis of average cost, with both operation and maintenance costs and capital depreciation included.[34] This requirement is enshrined in the 1982 Just Distribution of Water Law, the title of which makes the rationale for full cost pricing self-evident. For urban areas, a 1990 act allows for full (average) cost recovery, including both capital and depreciation costs. As a result of this bill, in 1996 tariffs were increased by 30 per cent for household consumption above 45 m^3 per month, and the tariff for commercial and industrial use was set higher than residential consumption, a step which reversed an earlier policy.

Where does this leave the poor? In almost every MENA city, an appropriate water price, one that would allow for reinvestment in the system to serve the unserved poor, would be less than the very high prices they are currently compelled to pay, but higher than the current prices paid by serviced urban residents. Using Jordan as an example, unserved residents in Amman are known to have paid up to US$ 14 per m^3 or more, while served residents pay a maximum of US$ 0.50 per m^3. And yet, the full cost of provision is about US$ 1 per m^3. This indicates a significant subsidy to the part of the population that is already served and leaves plenty of scope to set a price for water that ensures a lifeline supply of water to all, as in Iran, where the first 30 litres or so per capita per day (lpcd) is provided free to all domestic customers in urban areas. In the Iranian situation water is treated as a fundamental human right for the volume necessary to meet basic human needs. In the cases of Jordan, Tunisia, Yemen, and most likely in

other MENA countries, this basic need would represent less than one per cent of the per capita annual renewable freshwater supply.

A lifeline tariff policy should be sufficient to ensure that everyone, rich or poor, receives a sufficient supply of water, their fundamental human right. In addition to this, in Islam, the poor should receive *zakaat*. Literally, *zakaat* means 'the purification (of wealth)' a 2.5 per cent tax on wealth accumulated during the year that is collected and redistributed among the poor. This social safety net for the poor is one of the five pillars of Islam, and it is incumbent upon every Muslim to pay it.

For volumes of water above the basic level necessary for human needs, water can and should be considered an economic good in Islam. For instance, the rate for swimming pools in arid areas should be high enough to discourage this practice, or where pools are allowed, the rate should generate enough income to help subsidise extending lifeline volumes of water to the poor. In the case of other sectors, such as industry, water should absolutely be considered a commodity, and industrial tariffs should be higher than domestic ones, particularly because in Islam, industrial use merits at best, fourth priority, behind humans, domestic animals, and agriculture. High-tech industries in particular consume large amounts of water, but often pay tariffs less than domestic rates. For instance, in Albuquerque, New Mexico, Intel Corporation pays a quarter of the amount the city's resident's pay for their water.[35]

Public private partnerships

According to Islam, a government may fully recover its costs for providing water to its people, but at the same time it must provide a social safety net to protect the poor. Does this preclude the opportunity for privatisation within the water sector?

First, the government's primary obligation is to ensure equity meaning that all of its citizens, rich or poor, receive their fundamental human right-water of good quality at a price they can afford. Second, it is unlikely that full privatisation, meaning a private sector company could 'own the water', or gain long-term water use rights for an indefinite period, is permissible in Islam. Most water resources are public goods, and thus cannot be sold by the government to private interests. The category of water that is defined as private comprises of a relatively small volume.

However, if a government felt that following the principle of *maslaha* or public interest, it could 'privatise' an existing public utility, or give a private corporation the right to provide water services and recover costs, including earning a fair profit[36] related to the equilibrium price for a good in the market. The model would be one of a public – private partnership, where the government maintains its 'ownership' of water for the community, and allows the private sector to deliver (withdraw, treat, and distribute) water and sewerage services. Note that this could not be considered deregulation; on the contrary,

the government, under its obligation to its people would have to carefully regulate the sector to ensure equitable access and prices and to maintain quality standards.

In Iran, not only did the 1990 Urban Water Act allow for full-cost recovery of average costs, it also set the legal foundation for private-sector participation in urban water affairs, and municipal water and sewer companies were established after the approval of the 1990 Act.

Water markets

It has been established that within Islam it is permissible for the private sector to deliver water services and for some categories of water to be privately traded as long as the practice does not harm others. In this case, can those who have been allocated water use rights by the government voluntarily transfer their water use rights to others?

It is useful to examine the Islamic perspective relating to the market and capitalism in general. First, it is important to note that a fair and free market finds support in Islam. Muhammad (pbuh) was a businessman prior to his prophethood, and he set the example for ethical business dealings by earning the title *Al-Amin*, 'The Trustworthy,' for his personal integrity and fair business dealings. Second, as has been shown, private water rights, separate from rights to the land the water is on, are allowable for even as precious a commodity as water and that individual are free to sell or trade their private water. Furthermore, as noted by Sadr[37] as the economy of the early Islamic state grew, markets for water were established; the first medium of exchange was crops, then water and finally money.

One of Barlow's fears is that treating water as an economic good will lead to farmers' being cut off from a supply of water. Depending upon who the farmers are and what they are growing, this might not necessarily be a negative result. In the arid Middle East, enhancing equity means that it is time to take a hard look at how fresh water is allocated. Although some water can be saved through domestic conservation practices, the amount is limited because people in MENA already use water very sparingly. The rapidly growing population mean that more water will have to be allocated for domestic purposes.

To meet primary human needs in a more equitable fashion, fresh water will have to be diverted from usage in agriculture, because in MENA, that is where 80 per cent of it is used. The advantage of treating water as an economic good is that this allocation becomes naturally apparent, because even with low tariffs, in most cases, the value of water is at least ten times higher in urban areas than it is in agriculture (Gibbon, 1986). A policy of inter-sectoral transfer will have to be accompanied by increasing urban wastewater treatment and recycling as much water as possible back to agriculture. Shuval suggests that a small amount of fresh water, 25 m^3 per person per year should be reserved for the domestic production of fresh vegetables that have high economic and nutritional

value. Where feasible, most other crops in arid countries will have to be grown, increasingly and eventually solely, with treated wastewater or imported. After a detailed study in consultation with scientists and engineers, the Council of Leading Islamic Scholars (CLIS) in Saudi Arabia concluded in a special *fatwa* in 1978 that treated wastewater can theoretically be used even for *wudu* and drinking, provided that it presents no health risk (CLIS, 1978).

Are inter-sectoral water markets allowable in Islam? Two main prerequisites of water markets are that clear rights to water must exist separate from rights to land and that those rights must be tradeable. As already discussed, according to *sharia*, for most categories of water, these prerequisites exist as long as the rights of others are not harmed in the process. However, is inter-sectoral reallocation desirable from an Islamic viewpoint? In the priority of use in Islam that has been presented here, irrigation has third priority. Obviously, as a population evolves from a rural, agrarian society to an urban, industrial one, reallocation is not only permissible, but is required to preserve equity, and to satisfy the primacy of the right of the poor to quench thirst. The market can be used as a tool by the government to achieve this reallocation, but it must be regulated by the government so that the market acts in the public interest, and does not impede equitable distribution. Already, the growing scarcity of water and its high black market price has resulted in the growth of unregulated water markets all over MENA. However, such unregulated markets without necessary legal, institutional, and economic measures, can lead to unsustainable practices as they have in India, where groundwater tables have dropped alarmingly as a result of farmers selling their water to other farmers or cities by ironically – pumping with subsidised energy.

However, in contrast to the wave of neoclassical economics engulfing the world which itself has become almost a religion: the rationale for reallocation here is not economic. It is social: the desire to enhance equity. The market approach is merely a tool that a government can use to increase fairness within its society. If regulated internal water markets are to be used as tools by MENA governments, then they must put in place legal, institutional, and regulatory mechanisms to ensure that such markets operate fairly and efficiently. Primary among from institutional mechanisms that will allow for community input and participation in the process so that everyone concerned makes the hard choices necessary for equitable and allocative efficiency.

In contrast to the centralised decision-making system in many Muslim countries, the input of the community on any matter that concerns it, including water management, is mandatory in Islam. In the *Quran*, believers are defined as those who, among other things, '...(conduct) their affairs by mutual consultation....'[38] This approach is required by all leaders in Muslim countries and was even required of and followed by the Prophet Muhammad (pbuh) himself.

The regulation must also include an analysis of environmental impact. The advantage of intersectoral markets and reallocation in the Middle East is that the countries are small, and in most cases, sectoral reallocation does not justify large-scale diversions across water basins. In cases where reallocation would require such large-scale diversion across basins, it is unlikely to be socially or environmentally acceptable, and as such, would not be in the public interest.

BULK WATER EXPORTS AND INTERNATIONAL TRADE

International water markets for bottled water exports are already well established. For example, the year 1998 witnessed the global trade of bottled water in excess of 18 billion litres.[39] Until now, however, bulk exports of water across national borders and water basins have not been economically feasible. Because of the growing value of water in domestic and industrial sectors and innovative means to transport the water, such as in medusa bags (huge plastic bags towed behind barges) or in super tankers that carry water one way and return with oil, such schemes may now be profitable. Whether or not pressure for large-scale bulk water exports will continue to mount depends largely on further advances in desalination. If the cost of desalination drops low enough, then it will be cheaper to generate freshwater from seawater or brackish sources, near where it is needed, than of importing freshwater in bulk from another country. However, even with low desalination costs, the globalisation of the economy may also make bulk water exports economically attractive. For instance, Barlow outlines one proposal to take Alaskan water to China, the economic rationale is to use the abundant cheap labour available in China and to import the water necessary in the assembly of computer wafers.[40]

In Canada, most, but not all, such proposals for the export of bulk water have been for relatively small volumes of water flowing directly from glaciers, lakes, or rivers into the sea or for small amounts relative to the annual recharge of the water body. On the surface such proposals, in the volumes proposed, may have minimal social and environmental impact; since the water is running directly into the sea, no one is drinking it. The problem is that while early proposals may have minimal social or environmental impact, in the future, or in a year of drought, the practice might have negative social or environmental impacts. Yet according to many activists such as Barlow, existing trade agreements favour commerce over environmental protection and may not allow a decision to export to be reversed, hence limiting the governments' ability to 'turn off the tap'.

What is the Islamic perspective on bulk water exports? It is not possible to make a general statement, and more research is required on this topic new in the history of humankind, but several general observations can be put forward. First, the government would have to make such a decision on behalf of the people. The decision could not be left to

the discretion of individual private sellers. Although private sellers do have the right to 'sell' some categories of water, these volumes are small compared to the volumes of public water, so it would likely be public water that would be considered for such a proposal. It would be the responsibility of the government to decide what is in the public interest (*maslaha*). This entails taking into account the necessity to preserve the equity of access to an adequate supply of fresh water, and also to uphold the rights of the environment. According to *hadith*, in emergency situations where one state has excess water ensuring that one shares food with a hungry neighbour, that state would have the obligation to share its water, as long as the transfer did not unduly harm the environment. However, in general, given the strong emphasis on conservation in Islam, in the long term, it is better for a society to live within the means of its water basin, and for it to limit its activities to those that make sense in accordance with the quantity of water available. As noted before, in arid countries, this precludes the use of fresh water in large-scale irrigated agricultural schemes.

Some limited international trade of small volumes of water across watersheds such as the export of bottled water, may be permissible according to Islam, as long as the amounts withdrawn do not damage the integrity of the environment or sacrifice the water rights of others. However, trade agreements that allow international commerce to override the public interest in safeguarding social equity and the environment would appear to be against the spirit of Islam. Thus, it would be incumbent upon Muslim governments, on behalf of the people, to ensure that such agreements are negotiated in a way that ensures that the goal of equity supersedes the goal of profit.

CONCLUSION

A number of advocates for the poor have questioned whether water can simultaneously be considered both a social and an economic good. These are legitimate questions. This paper has examined whether, from an Islamic perspective, water can be considered a fundamental human right, and Islam's perspective on alternative governance approaches that could evolve from viewing water as an economic good.

In Islam, water is a social good owned by the community, and by further considering the Islamic emphasis on equity, water can be considered a fundamental human right. Furthermore, under Islam, the environment also has specific and strong rights to water. In Iran, all urban residents are allocated a lifeline volume of water free of charge in order to meet their basic requirements. Likewise, Islam allows for private-sector involvement in service delivery, and up to full cost recovery for water and wastewater services. In other words, Islamic law strictly prohibits full privatisation of water rights, in the sense that a private firm can claim ownership over significant public water resources, or even long-term water use right.

However, as long as the public interest is served and respected, and the rights of others are not infringed upon, individuals can trade their water rights in water markets. Indeed, given the scarcity of water in MENA, it must be considered that domestic use of water has first priority over irrigation. To this end, it may well be incumbent on the government to encourage intersectoral reallocation. However, if governments elect to draw on markets to accomplish this, they must put into place institutional, legal, and regulatory mechanisms, which will guard the public interest. That is, public input must be facilitated, equity must be preserved, and existing public water rights must not be compromised.

While more research is required on the subject, it is probable that long-term, bulk water exports would not be in the public interest in most situations, especially if such arrangements become irreversible under existing international trade agreements. While free and fair markets find favour in Islam, the government can and certainly should intervene if it finds that the principles of equity and public interest are being contravened.

NOTES

[1] In this paper, the MENA region includes the following countries Algeria, Egypt, Jordan, Lebanon, Morocco, Palestine, Sudan, Syria, Tunisia, and Yemen IDRC supports projects.

[2] Many countries in MENA are predominantly Muslim, and this region faces the greatest water challenge, so much of the discussion in this paper focuses on this region. However, the conclusions drawn are based upon the Islamic perspective and thus apply to other Muslim regions.

[3] World Water Vision (1999), Executive Summary, p. 49.

[4] Mehta (2000), p. 6

[5] South African Water White Policy Paper (1997), Section 5.2.1. 'Basic Needs'

[6] World Water Vision: Making Water Everybody's Business. 2000 'Three Global Water Scenarios' CD Rom p. 22

[7] World Water Vision, Executive Summary, p. 2

[8] Maude (1999).

[9] *Ibid* page 11.

[10] The principle 'water is an economic good' was worded in a very general way at the 1992 UNEP Dublin Water Conference because, among other reasons, some participants from predominately Muslim countries argued that selling water was against Islam (Biswas, personal communication).

[11] This section and the following ones draw partly on Faruqui *et al.*, 2001, *Water Management in Islam*, UNU Press and IDRC Books. The Holy Quran and the Sunnah are very clear on the main principles of Islam, such as the oneness of God. However, in Islamic jurisprudence (Fiqh) there are differing schools of thought on other issues that touch people's everyday lives, including water management. This diversity of opinion is both healthy and a source of rich scholarly tradition. Some Islamic scholars may disagree with specific conclusions presented in this paper,

including the following: *Provided that the sole rationale is to promote equity, recovering costs for water services are permissible in Islam*. Most of the conclusions presented, made all with the best intentions, sincerity and available knowledge, are based on a consensual interpretation of the 18 scientists who contributed to *Water Management in Islam*, a few, such as this Islamic position on bulk water markets which go beyond the subject matter of this book are based on my own interpretation. I have provided all Islamic sources, along with the reasoning upon which the conclusions are based. I do not intend to suggest that these interpretations represent the only Islamic position. Other Muslims or Islamic scholars may disagree with these conclusions, and I respect their right to do so.

[12] The Quran is the primary source for Islamic values. Muslims believe that it is the exact word of Allah revealed to the Prophet Muhummad (pbuh). The second source is the *hadith*, documented narration of the Prophet's Sunnah, or what he said, did, or tacitly approved. After the Quran and the *sunnah*, *ijtihad* (inquiry, innovation, and interpretation) can be used to make rulings that address new questions related to changing conditions. One of the five tools used by Islamic jurists to make such rulings is *maslaha* (public interest) or *istilah* or (human welfare).

[13] Quran, Muhammad: 12

[14] The life-giving quality of water is reflected by the Quranic verse 'And Allah has sent down the water from the sky and therewith gives life to the earth after its death'; (Al-Nahl: 65) Not only does water give life, but every life is itself made of water, as attested in the *Quran*: 'We made from water every living thing' (Al-Anbiyaa).

[15] Peace be upon him

[16] Hadith, Moslem: 1411

[17] 'None of you will have faith till he wishes for his (Muslim) brother what he likes for himself.' Hadith, Al-Bukhari. 1. 12

[18] The Prophet (pbuh) stated that among the three people Allah will ignore on the day of resurrection are "a man possessed superfluous water on a way and he withheld it from the travellers, Hadith

[19] Riches ought '...not (merely) make a circuit between the wealthy among you', Quran.

[20] Writings in the *Hadith* have effectively made water a community resource to which all, rich or poor, have a right: 'Muslims have common share in three things: grass (pasture), water and fire (fuel).'

[21] Quran, Al-Anam: 99 The Prophet (pbuh) said, 'there is a reward for serving any animate (living being)', Hadith, Al-Bukhari. 8. 38.

[22] 'He who digs a well in the desert ... cannot prevent the animals from slaking their thirst at this well.' Hadith, Al-Bukari. Vol. 2., p.103-not in Alim.

[23] Quran, Al-Anam: 99. The Prophet (pbuh) said, 'there is a reward for serving any animate (living being)', Hadith, Al-Bukhari. 8. 38

[24] Quran: Fatir: 77

[25] Amery, in Faruqui *et al.* (2000).

[26] 'O Children of Adam .... Eat and drink: But waste not by excess, for God loveth not the wasters.' Quran, Al-A'raf: 31

[27] The statement that the supply of water is fixed and that therefore, at some point, demand must be managed because supplies cannot be infinitely increased is '*And we send down water from the sky in fixed measure....*' (Quran, Al-Muminun: 18). The Prophet Mohammad (pbuh) 'used to perform ablution with one *Mudd* of water (equal to 2/3 litre) and used to take a bath with one *Sa*' up to five *Mudds* (equal to 2–3.5 litres). (Hadith, Sahih Al-Bukhari1.200 – narrated by Anas)

[28] 'Do not waste water even if performing ablution on the bank of a fast-flowing (large) river.' (*Hadith*, related by Ahmad and Ibin-Majah, Fiqh-us-Sunnah, 1: 32 d).

[29] Hadith, Moslem: 1727

[30] For instance, one has the right to trespass on private lands satisfy thirst if one's life or health is in threatened, and no one has the right to hold back surplus water (Al-Bukhari, 9. 92)

[31] Hadith, Moslem: 3798

[32] Abderrhaman, in Faruqui *et al.* (2000).

[33] Djebbar, Faruqui *et al.* (2000).

[34] Sadr, in Faruqui *et al.* (2000).

[35] Maude (1999).

[36] In an endorsement of fair markets, the Prophet refused to fix the prices of goods in the market, except in special circumstances. In fact, most Muslim scholars agree that a just price for any good is that determined in the market, providing that the market is free from unfair practices such as collusion (Khomeini 1989, 4:318–319).

[37] Sadr, Faruqui *et al.* (2000).

[38] Quran: Ash-Shu'araa: 38

[39] Maude (1999), p. 25

[40] *Ibid*.

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WATER IN HINDUISM: CONTINUITIES AND DISJUNCTURES BETWEEN SCRIPTURAL CANONS AND LOCAL TRADITIONS IN NEPAL

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ABSTRACT

Water is a multifaceted symbol in Hinduism. It is regarded as one of the *pancha-tatva* or five primeval elements of the universe. While the notions of water as primal matter, an instrument of purification and expiation, a unifying force, and a vivifying element can all be found in Hinduism, in most *dharmashastras* or Hindu religious texts, the symbolism of water as an instrument of purification and expiation is pre-eminent. The continuities between written Hindu traditions and local discourses in a Hindu community include such practices as *snana* (ritual bathing) and *tirtha* (pilgrimage), the notion of water as *basi* (stale) *sazi* (fresh) or *raamro* (good) and the association of ritual purity and pollution with water. The continuities between certain caste practices prevalent in the hill Hindu community, like not allowing Dalits (untouchables) access to water sources, and the caste and water pollution instructions of the written texts are, however, weak. Discontinuities also exist. The dispensing of *snana* in favour of ordinary bathing among the younger generation is one example. Another is the disjuncture between written Hinduism's instructions about the profuse use of water and its actual sparse use in the local community. A disjunction is also apparent between the scriptural view of water and the view of modern legislation. While the *dharmashastras* associate water with cleanliness and ritual purity and leave the ownership of water undefined, Nepal's modern laws views water as a resource and vests its ownership in the State. Giving the convenience and economic benefit of the general public as its rationale, the State has increasingly expanded its role in controlling and managing this national resource.

A MULTIFACETED SYMBOL

Water is a multifaceted symbol in Hinduism. Along with earth, fire, air and ether, it is regarded as one of the *pancha-tatva,* five primeval elements of the universe. Water as a particular element with associated characteristics and related symbolism forms the basis of the texts of the *Jyotish Shastra* (Hindu astrology) and the *Ayurveda* (ancient Hindu medicine).

Mythical-religious facts symbolised by water in Hinduism depict it as primal matter, as an instrument of purification and atonement, as a unifying force and as an enlivening element.[1]

The symbolism of water as primeval matter is underscored in the creation myth of the *Manusmriti*. According to the opening paragraphs of the *Manusmriti*:[2]

> Once upon a time this universe was made of darkness, without anything that could be discerned, without any distinguishing marks, impossible to know through reasoning or understanding; it seemed to be entirely asleep. Then the Lord who is self-existent, himself unmanifest, caused this universe to become manifest putting his energy into the great elements and everything else, became visible and dispelled the darkness… first he emitted the waters …

In this myth water emerges as a symbol of primeval matter. In fact, in old Sanskrit, the term for water is *apah*, or 'that which pervades'.

A myth which brings to the fore the symbolism of water as a vivifying force is recounted in the *Rig-Veda*, the oldest of the Hindu scriptures. It tells the story of the god Indra slaying the demon Vrtra after a long battle and freeing the river Indus (*sapta-sindhu* in Sanskrit). Figuratively, this act is seen as representing the slaying of primal inertia and the setting flowing of the waters of life. Thus when the Vedic god Indra is propitiated, he is hailed as the slayer of Vrtra.

> Ye with your strength have pierced the fountains of the floods, the Sun have ye brought forward as the lord of the heaven. Cheered by this magic drought ye, Indra-Varuna, made the dry places stream, made songs of praise flow forth.[3]

If Indra is propitiated as the god of thunder and rain, Varuna is revered as the lord of the waters. The liberation of water during the mythical battle is equivalent to the end of the dry season or a drought and to the reviving of vegetation.

Another symbol of water that is prominent is its reflection of primordial wholeness. Water represents a dimension of human existence which is open. Thus water is said to restore wholeness. For instance, a verse in the *Kathaka Upanishad*, a genre of scriptures composed after the *Vedas*, sings the praises of *yathodakam suddham* or pure waters of understanding:

> As water descending on mountain crags,
> wastes its energies among the gullies,
> so he who views things as separate,

wastes his energies in their pursuit.
But as pure water poured into pure
becomes the selfsame – wholly pure
so too becomes the self of the silent sages,
of the one, O Gautama, who has understanding.[4]

Finally water was conceived of as an instrument of purification and expiation. In the *Rig-Veda* there are hymns addressed to waters as divinities in which the waters are regarded as pure and consequently able to purify others.[5] Water was sacred precisely because it had the potential to wash away sins. Just as water cleanses dirt and mud, so too does it cleanse sin. Water was regarded as *papamochana* or that which frees one from sin and impurity. A person was regarded as being clean after taking a ritual bath, or *snana*. This is exemplified, for instance, in a verse from the *Atharva Veda*, one of the four Vedas:

> May I be set free as if loosed from a pillar or loosed from the dirt after taking a bath! May all the gods cleanse me from sin, as butter is pure after passing through the strainer.[6]

While the symbols of water as primal matter, an instrument of purification and expiation, a unifying force and a vivifying element can all be found in Hinduism, in most *dharmashastras* or Hindu religious texts, the symbolism of water as an instrument of purification and expiation is pre-eminent. This paper first explores water, purity and pollution in the *dharmashastras*, focusing particularly on two key texts: the *Manusmriti* and the *Arthashastra*. It is followed by a discussion of the Mulki Ain of 1854 and of state legislation on water. A hill Brahmin community is then introduced and local hill Hindu traditions on water discussed. The paper ends with a concluding remark on the continuities and disjunctures between religious canons, state legislation and local traditions.

WATER, PURITY AND POLLUTION IN THE HINDU SCRIPTURES

The word for pilgrimage in Sanskrit as well as in Nepali is *tirtha*. In Sanskrit the word has many meanings including a road, a way or a ford in a river. In general usage, however, it referred to bathing in rivers, an act that was considered to be meritorious. *Tirtha* referred to a locality or spot or expanse of water, which gave rise to the accumulation of righteousness (merit) owing to its peculiar nature.[7] The word *tirtha* also refers to the palm of the right hand, from which water is sipped. The word thus retains its historical connection to a sacred bathing site.

In Vedic texts, rivers in general and certain named rivers are referred to with great reverence as holy and are in fact deified. These include the Saraswati (a river that existed during Vedic times but is now extinct), the Ganga and the Yamuna.

The confluence of one or more rivers is generally regarded as sacred. Prayag, also known as Allahabad (situated in the modern state of Uttar Pradesh in India), is revered as the confluence of the hidden and mythical river Saraswati, the Ganga and the Yamuna. Once every twelve years the Kumbh Mela (the Aquarius festival) takes place there. Other important pilgrimage sites are Varanasi and Haridwar in northern India and Pashupati in Nepal. They share certain distinct characteristics. The rivers in these sites are located east of the *ghats* or riverbanks so that a person taking a bath in the river naturally faces eastwards. It is considered auspicious to be cremated in these *ghats*. Among Hindus many of the daily, yearly and life-cycle rites such as daily bathing, bathing in the rivers on certain auspicious days of the year and cremation as well as cremation-related annual rites are conducted along river banks.

When the *dharmashastras* mention water, it is usually in the context of ritual cleanliness (*sucitva*). The religious scriptures regard cleanliness as one of the virtues of the soul (*atmagunas*). The texts further define cleanliness or *sauca* as being of two kinds: outward (*bahya)* and inward (*antara)*. The first is supposed to be affected by water and the latter by the purity of one's sentiments.[8]

The *dharmashastras* also specify the sources of ritual pollution. There are broadly three external sources of pollution:

1. *kula* or impurity from death or birth
2. *artha* or pollution from vessels and things, and
3. *sarira* or a bodily contaminaiton.

Thus water is essential in overcoming pollution emanating from these sources and in maintaining cleanliness.[9]

The religious texts mention the daily ablutions a person must go through. After relieving oneself, one has to rinse the mouth with 12 mouthfuls of water (*gandusa*) and then sip water (*acamana*). This is to be followed by brushing the teeth with special twigs (*dantadhawana)* and a ritual bath (*snana)* once for ordinary persons, and twice for Brahmins. In this regard, the *dharmashastras* talk about the daily obligatory bath or *nitya snana*. The texts also give a detailed description of when to bathe and when not to, and which verses (*mantras)* to recite while doing what.

The *dharmashastras* mention that the daily obligatory bath is to be undertaken by using water at its natural temperature and that ordinarily hot water should not be used because it does not secure the unseen spiritual benefits of a bath. The texts describe the

various tangible consequences that follow from a ritual bath (*snana)*, such as strength, beauty, clearness of complexion, pleasant voice, etc., aside from its unseen spiritual benefits. Natural water is said to exist in rivers, tanks connected with temples, lakes, deep reservoirs and mountain springs. The earth is to be employed for cleaning the body (as a type of soap) with detailed instructions about which type of earth to use and which not to.[10]

The religious texts, mention six kinds of baths. The major ones include (1) *kamya snana,* or a bath for some desired object, (2) *kriyanga snana,* or a bath for a religious rite such as dedicating a well, a temple, or a park to the public, and (3) *kriya snana* or a bath taken when a man regards bathing at a sacred place the reward of his pilgrimage.[11] The offering of water to gods, ancestors and sages, or *tarpana,* was a part and parcel of these special baths as well as of the daily bath, or *nitya snana*.

The *dharmashastras* also talk about the characteristics of ritually pure water. Such water should be in the ground, in its natural state, should not be polluted by anything impure, and should have a natural colour (i.e., it should be transparent), taste and odour (i.e., there should be either no odour or a fragrant one). The texts also mention that water collected on a stony surface and one that is flowing is always pure. Water brought in clean vessels is pure but becomes stale if it is stored for one night or more. Once water is stale, it should be thrown away. The texts also instruct how vessels are to be purified using ash, water and clay.[12]

Apart from its use during a bath, the texts instruct readers in the ceremonial sipping of water, or *acamana,* on occasions when ritual purity is required. Other religious uses of water include offering *arghya* (i.e. bathing the idols of deities in ritually pure water during daily worship) and *abhishekh* (i.e., sprinkling water for empowerment). The water used in bathing the image of deities is regarded as sacred and is ceremonially sipped (*acamana*) as the blessing of God at the end of each *puja* or worship of a deity.

Among the various *dharmashastras*, one that is commonly referred to as a guide to lay practices, including those related to water (such as ablutions, bathing, prayers, etc.), is the *Manusmriti* or the Laws of Manu. In Hinduism there is no one single religious scripture, which directs lay morality in day-to-day affairs. The *Vedas* are regarded as the most authoritative Hindu texts, but these are not consulted to guide lay morality. The *Manusmriti,* on the other hand, is the text that has perhaps exerted one of the greatest influences on informing lay morality among Hindu societies. It has also been perceived as embodying the worst in Hinduism and has been criticised, if not rejected outright by Hindu reformists.

Compiled around 200 AD, the *Manusmriti* consists of 2,694 stanzas divided into 12 chapters. It deals with various topics such as cosmogony, the definition of *dharma*, the sacraments, initiation and Vedic study, the forms of marriage, hospitality and funerary rites, dietary laws, pollution and purification, rules for women and wives, royal law, categories of juridical matters, and, finally, more religious matters, including donations,

rites of reparation, the doctrine of *karma*, the soul, and punishment in hell. Law in the juridical sense is embedded in the *Manusmriti* within the framework of the four-fold division of society.[13]

When describing the various types of charity, *dan*, the *Manusmriti* mentions the merits associated with gifts of water whether the construction or rehabilitation of wells, tapstands, spring sources, or other sources of water. It says that a person who gives water is satiated. The gift of water is mentioned as one of the acts that lead to great merit.

The *Manusmriti* is emphatic on instructions regarding what not to do with water. This is mentioned in the chapter dealing with initiation and Vedic studies (i.e., 4:45-48):[14]

> He should not eat wearing only one garment, nor take a bath naked. He should not urinate on the road, on ashes, in a cowpen, on a ploughed land, in water, on a mound piled up for the dead, on a hill, on the ruins of a temple, nor on an ant hill, ever, nor in a cave inhabited by living creatures, while moving or standing up, from the bank of a river, or on the summit of a mountain. He should never emit excrement or urine while facing the wind or looking at fire, a priest, the sun, water or cows. Similarly, it maintains that (4:56):
>
> He should not throw urine, excrement, or saliva into water, nor anything else that is smeared with impurity, nor blood or poisons.

Not to take a bath naked or eat with only one garment refers to issues of decency and the *Manusmriti* instructs the initiate about proper demeanour in this regard. Instructions regarding not urinating on water are meant to safeguard the purity of water sources. Not only should one not physically defile the water, one should not even look at water while urinating as to do so would be to show disrespect. Similarly, throwing urine, excrement, saliva or anything else smeared with impurity into water would lead to the pollution of the water source and so was prohibited. Similarly, the text instructs people not to tamper with water sources,

> .... anyone who diverts streams, or who amuses himself by damming them ... these are to be strenuously excluded (3:163).

If anyone steals water from a pond that was built in former times, or cuts off the supply of water, he should be fined at the lowest level (9:281).

It is not clear from the reference to water in these stanzas whether they relate to water for domestic purposes or for irrigation. It could mean that the water sources in question were used for both purposes.

If one were to look into the *Manusmriti* for references related directly to water, caste and pollution – i.e., from which castes water can or cannot be accepted – then the search would largely be in vain. For though there are numerous references to food, such as what to eat and from which sort of person food as *dan*, or a gift, can or cannot be accepted, there is hardly anything about the castes from which water can or cannot be accepted. What does exist aplenty in the text are references to sexual union and marriages. Needless to say, for the *Manusmriti*, the *varna* system is synonymous with social order. Since only *varna*-endogamous marriages led to the continuity of the *varna* system and marriage across *varnas* led to mixed peoples, *varna*-exogamous marriages, or varna *samkara*, were abhorred precisely for the reason that they undermined social order.

Chapter five of the *Manusmriti* has direct references to pollution. However, even in this chapter, most of the references relate to pollution accrued due to the death of a family member and not to pollution arising from contact with persons of various castes. Only one stanza in this entire chapter relates to pollution stemming from physical contact with a person of low status:

> If a man has touched a *divakirti* candala, a menstruating woman, anyone who has fallen from his caste, a woman who has just given birth, a corpse, or anyone who has touched any of these objects, he can be cleaned by a bath (5:85).

What is revealed is the extent to which organic life processes, be these related to menial activity, menstruation, birth and death are perceived as polluting. Chandala are a source of permanent pollution because they are involved in menial activities through out their lives. Menstruation is a very organic life-process, and therefore a source of pollution. Because of the delivery of children mothers are considered to be polluted during the first forty days after delivery. People in mourning are impure because they are associated with death.

As the above reference to *divakirti candala* makes clear, it was one of the most abhorred castes in the Manusmriti. In line with its general aversion towards mixed marriages, the Manusmriti abhors the *chandala* because the person was born out of a marriage between a Brahmin woman and a Shudra man. Though the *chandala* is clearly a person of the lowest social status in the *Manusmriti*, whether this person was indeed an untouchable, as we currently understand the term is, however, far from clear. There are two views on the matter: one which says that *candalas* were Shudras, the other, that they constituted the fifth caste – the untouchables.

According to Kane, the author of the *History of the Dharmashastras*, the view extant at the time of the early s*mritis* such as *Manusmriti*, was that there were only four *varnas* and that there was no fifth *varna*. Kane writes that *chandalas* were included among Shudras, and were not untouchables because the *Manusmriti* has a specific reference which

states that all degraded castes are similar to Shudra in their *dharma* (1941, 10:41). This view is rejected by authors like Doniger (1991), one of the recent translators of *Manusmriti*, who translated *chandala* as 'fierce untouchable'. Doniger, however, does not explicitly state the reasons for equating *chandala* with untouchability.

Since there are no direct references to water, caste and pollution (i.e., from which castes water can and cannot be accepted), untouchability, as we currently understand the term, was probably not yet formalised at the time of the *Manusmriti* otherwise, there would have been direct references to it. It must have been later in *smritis* that were compiled after the Manusmriti or simply through usage and custom that a distinction was made and that the distinction between Shudras and castes like *chandalas* was formalised. New castes must have been added to the list of untouchables.

While the *dharmashastras*, including *Manusmriti*, sought to address the concerns of lay morality in society, the *Arthashastra*, a treatise on political economy composed around the third century BC, addresses the concerns of the state and its helmsmen. The *Arthashastra* has often been compared to Machiavelli's *The Prince*. In contrast to *The Prince*, though, the text is not limited to the art of politics. The *Arthashastra* encompasses both the art of government and the political economy of the state in one treatise.[15] The text often served as a manual of instruction for kings and officers of states in South Asia up to pre-Islamic times. The *Arthashastra* also seems to have influenced the rulers of the incipient Nepali State in its formative years (e.g. Dibya Upadesh) during the eighteenth and nineteenth centuries.

The *Arthashastra* covers administration, law, order and justice, taxation, revenue and expenditure, foreign policy, defence and war. When water is discussed in the *Arthashastra* it is usually in the context of irrigation. This is probably because irrigation was necessary for a state that received the bulk of its revenue in the form of agricultural products. Water, in the form of irrigation has been extensively discussed under sections dealing with 'Aspects of the Economy'.

The text suggests that all water belonged to the king and that users paid a water rate for taking water from irrigation systems.[16] There were different taxation systems for irrigated and rain-fed agriculture. In irrigated agriculture (where water was be extracted by mechanical means), as much as one third of the produce went to the state treasury, whereas if water had to be transported manually from the source, taxation was as low as one fifth of the produce. There were also tax exemptions for a few years for constructing new tanks or embankments or for renovating abandoned water works. Punishment was prescribed for a person who failed to cooperate in the building of an irrigation system. Irrespective of whether the cost of building a dam or an embankment was borne entirely or only partly by the state, all the fish, ducks, and green vegetables produced in or near a reservoir were the king's property.

It is also apparent from the text that the state was not concerned with domestic water. In fact there is not a single reference concerning domestic water in the entire treatise. Moreover, the text does not seem to be concerned with safeguarding ritual norms and lay morality, as the *Manusmriti* does.

THE NEPALI STATE AND LEGISLATION RELATED TO WATER

The Mulki Ain was the first comprehensive law enacted by the Nepali State. Introduced in 1854, it consciously drew upon the *dharmashastras*, mainly *Naradsmriti* and, to some extent, other *smritis*, though some customary laws were also retained.[17] The Mulki Ain related primarily to the fields of administrative and personal law. Prior to the promulgation of this comprehensive law, royal decrees were issued by a reigning monarch or in his names for specific purposes. With the introduction of the Mulki Ain, the State gave legal sanction to caste norms. It also sought to replace the separate caste frameworks then prevalent in the hills, the Tarai and the Kathmandu valley with an overarching national framework.[18]

The water line – discrimination among groups on the basis of water acceptability – acted as a basis for the major demarcation. Castes from whom water could be accepted, or *pani chalnya jat* included, in order of ritual purity, (1) *tagadhari* (sacred thread-wearing groups) (2) *namasine matwali* (unenslavable alcohol consuming groups) and (3) *masine matwali* (enslavable alcohol consuming groups). Castes from whom water could not be accepted or *pani nachalne jat* included (4) *pani nachalne chhoi chhito halnu naparne* (from whom water cannot be accepted but contact with whom does not require purificatory rites) and (5) *pani nachalne chhoi chhito halnu parne* (castes from whom water cannot be accepted and contact with whom requires purificatory rites). Degrees of punishment for transgressing caste norms were specified, including execution. Other references to water in the Mulki Ain are with regards to various aspects of irrigation. These relate to priority in the right to acquire water and to the allocation and distribution of irrigation water

Numerous amendments were made to the Mulki Ain over the years and finally a new Mulki Ain was promulgated in 1963. This Mulki Ain has several provisions relating to land rights, but only a few relating to water, namely water for irrigation. Clause 8/3 states that to cultivate barren land, a canal can be channelled through someone else's land with due compensation. This was stipulated with the intention of encouraging land reclamation and to expand the area of land under cultivation. The Mulki Ain also establishes prior rights in irrigation with water accruing to those who dig a canal first. It elaborates that the construction of a new canal should not affect the quantity of water an older canal receives.

Clause 19/10 (a) of the Mulki Ain prohibits social interactions based on the caste system. If anybody following the caste system engages in discriminatory behaviour, does not allow anyone in a public place or prohibits anyone from consuming items in public

places, that person can be jailed for up to one year or fined up to Rs 3,000 or both.[19] With this clause in the Mulki Ain, the State formally withdrew support from the caste system.

Underlying the Mulki Ain's provisions relating to water were the relations between land and water rights for irrigation. The Mulki Ain does not define who owned water sources such as rivers, streams and lakes. In contrast, the Canal Act of 1961, the Canal, Electricity and Related Water Resources Act of 1967 and the Water Resources Act of 1992 increasingly vested ownership of the water within the kingdom in the state (R. Pradhan, 2000).

The Preamble of Canal Act of 1961 states: 'Keeping in mind the convenience and economic benefit of the general public, it is necessary to use and control naturally flowing as well as stored water from all rivers, streams, ponds and lakes to make good arrangements for irrigation.' Pointing at the convenience of the general public, the State, with this Act, clearly asserted its right to regulate and control water. This was the first legislation devoted specifically to irrigation, especially to state-constructed canals. In claiming ownership of water above or below the surface of land owned by the government, the State claimed ownership of natural resources for the first time, albeit in an oblique way.

While the Canal Act of 1961 regulated water sources supplying water to government irrigation systems, the Canal, Electricity and Related Water Resources Act of 1967 attempted to control and regulate the use of all water sources, for whatever purpose. The Preamble of the 1967 Canal, Electricity and Related Water Resources Act states: 'Whereas it is expedient to regulate the use of important national wealth such as rivers, streams, lakes, water falls and underground water for the convenience and economic benefit of the general public...' What the preamble reveals is the increasing tendency to look upon water as an important resource. This Act weakened individual and private rights to water in relation to the rights of the State, supposedly for the convenience and economic benefit of the general public. Subsequent to its enactment, individual and private water rights became secondary to the rights of the State and the public.

The Mulki Ain is a comprehensive Act, not a constitution per se. Nepal's first constitution was introduced towards the end of the hereditary Rana rule in 1947. With the demise of the autocratic regime in 1951, successive constitutions were introduced: the interim constitution of 1951, the royal constitution of 1959 and the panchayat constitution of 1962. The country is currently governed by the Constitution of Nepal, 1990, drafted in the aftermath of the people's movement by a committee appointed by the reigning monarch and the leaders of the hitherto banned political parties.

The Constitution of Nepal 1990 defines Nepal as a multiethnic, multilingual, democratic, independent, indivisible, sovereign, Hindu and constitutional monarchical kingdom.[20] Though the constitution retains the term 'Hindu', it does not define the term nor does it specify in which ways the state is 'Hindu'. In this ambivalent situation one might argue that the 'Hinduness' of the state could be searched for in its specific laws. The

following section looks at legislation dealing with water and the extent to which these relate to Hindu notions of water in the manner of the *dharmashastras.* The legislation dealing with water discussed below includes the Water Resources Act of 1992, the Water Resource Regulations of 1993 and the National Water Supply Sector Policy of 1998.

The Water Resources Act of 1992 states in the preamble that an act of its type was necessary in the first place, to make arrangements for 'rational utilisation, conservation, management and development of the water resources that are available in the Kingdom of Nepal'.[21] In calling for the rational utilisation, conservation, management and development of water and conceiving of it as a resource, there emerges a distinct break with the *dharmashastras* and their religious notions of water. Instead it builds upon the Canal Act of 1961 and the Canal, Electricity and Related Water Resources Act of 1967 in explicitly vesting ownership of all types of water above or below the ground, on private or public land, such as rivers, lakes springs or wells, in the state.

It is ironic that modern legislation in Nepal shows little or no concern with retaining Hindu ideas associated with water even as the Constitution of Nepal of 1990 identifies Hinduism as the state religion. The example of the changes in water laws supports the arguments being made by some in Nepal that the term 'Hindu' in the present constitution has been retained for political purposes and that laws in Nepal are not guided by Hindu precepts.[22]

The Water Resource Act of 1992 vests the ownership of water in the state and bars its utilisation without obtaining a prior licence excepting that for individual or community sustenance purposes. It states that persons wishing to make use of water resources for collective benefits on an institutional basis should form a Water Users Association as prescribed and become duly registered.

Clause 7 of the Water Resource Act 1992 presents a priority order on utilising a water resource. It accords first place to drinking water and domestic use, followed by irrigation, and then agricultural uses such as animal husbandry and fisheries. Next in priority come cottage industry, industrial enterprises and mining uses, navigation, recreational uses, and other uses. What is interesting to note in this regard is that though drinking water and domestic use come first in the priority, there is no mention of religious uses. One has to assume that either domestic use subsumes religious use or that religious use is trivial and so not deemed important enough to be mentioned. For a state that officially identifies itself with Hinduism, do not mention the religious use of water in the Water Resource Act of 1992 – is ironic to say the least.

The principles enunciated in the Water Resource Act of 1992 are elaborated in the form of rules and regulations in the Water Resources Regulations of 1993. The content of this document includes consumer associations, provisions relating to the use of water resources, inquiries relating to disputes regarding water resources, provisions relating to

service charges, acquisitions of houses and land and compensation for them and miscellaneous issues.[23]

The Water Resources Act of 1992 can be read as the culmination of the State's attempt to vest the ownership of water in itself, which began with the Canal Act of 1961 and proceeded with the Canal, Electricity and Related Water Resources Act of 1967. It also reveals how the State began to perceive water as an important source of national wealth a potential source of great revenue for itself.

Policies dealing specifically with domestic water are enunciated in the National Water Supply Sector Policy of 1998. After the promulgation of the Water Resource Act of 1992 and the Water Resource Regulations of 1993, following which various water-related policies such as the irrigation and hydroelectricity policies were enacted immediately, it took several years before a domestic water policy was formulated. It was as late as 1998 that policies and strategies for the national water supply sector got underway.

The National Water Supply Sector Policy of 1998 rationalises investment in the sector on the grounds that the provision of convenient, safe and adequate drinking water to all people is necessary so as to ensure social and economic development as well as public health improvements.[24] The National Water Supply Sector Policy of 1998 aims to achieve three principal objectives: (1) to ensure safe, convenient and adequate drinking water facilities to all Nepalese generally and to disadvantaged groups particularly with sanitation as an integral component; (2) to reduce the incidence of water-borne disease extensively prevalent in Nepal; and (3) to lessen the drudgery of women and children traditionally involved in collecting water and use the labour and time saved in productive activities.

In order to achieve these objectives, the document specifies certain policies. These relate to planning and programming, technology, quality, institutions, a legal framework, financial aspects, operation and maintenance, and information management. The document then outlines strategies which relate mainly to project planning and design, technology, water quality, institutional aspects, a legal framework, finance, operation and maintenance, gender equality and service development. Though the National Water Supply Sector Policy of 1998 lists policies and strategies, it fails to provide a broad policy framework. As a result, the document reads more like a list of recommendations than a policy document.

The preceding section examined the written traditions related to water. The written traditions examined included both religious scriptures (*dharmashastras*) and modern legislation enacted by the Nepali nation-state. The *dharmashastras* associate water with ritual cleanliness and purity but modern legislation has made a distinct break with these ideas. Modern legislation, which vests the ownership of all the water in the kingdom in the state, perceives water as a resource that needs to be utilised (to generate huge revenues for the State) and does not associate water with notions of purity and pollution. The following section first introduces the hill community studied and then probes local traditions on water.

JHIRBHANJYANG – THE RESEARCH SITE IN THE HILLS

The Shirunga Jhirbhanjyang drinking water scheme is located in Chappani Village Development Committee (VDC) of Palpa District in the hills of western Nepal. The scheme derives its name from the source (Shirunga) as well as the settlement (Jhirbhanjyang). The settlement lies about seven kilometres northwest of Tansen, the district headquarters, and takes about two hours to reach on foot. There is a motorable road that connects Jhirbhanjyang with the district headquarters, but the road is good only for tractors and jeeps and is serviceable only during the dry months. There is one health post and one veterinary service centre in the VDC. Most of the users of this scheme live in Jhirbhanjyang village in wards numbers 3 and 9 of Chappani VDC, while the source is located in ward five of the same VDC. There are a few users also from wards 8 and 9 of Barangdi VDC.

The settlement is located at an altitude of around 4,000 feet above sea level, and is scattered along a low-lying ridge and the upper parts of a hill. The suffix *bhanjyang* to the village's name suggests that it sits on a saddle between two peaks. The settlement is not a tightly knit but dispersed. Each household has some unirrigated upland (*bari)* adjacent to the house.

The 89 households of Jhirbhanjyang make up a total of 579 people. On average a household has six members. The incidence of child mortality is high; for every five children born, only four survive. (The child mortality rate for the country as a whole, according to the 1991 census, is 165:1000). The extent to which water-borne diseases or other factors such as acute respiratory illness (ARI) or unsafe home delivery contribute to high child mortality is, however, not very clear.

In terms of ethnicity and caste, most of the households are *Jaisi Brahmins* and come from a clan known as *Basyal*. Jaisi *Brahmins* are regarded as being lower in ritual status than other Brahmins since they are considered to be the offspring of a union between a Brahmin man and a Brahmin widow or divorcee.[26] Because of their lower ritual status, they may not operate as officiating priests in households or in temples and may not receive ritual gifts. They can, however, work as astrologers. In Jhirbhanjyang, 86 households were Jaisi Brahmins; the other three were Magars.

The dominant family structure in Jhirbhanjyang is patriarchical and is characterised by male authority, respect for elders, and agnatic[26] (kinsmen on the father's side) solidarity. Upon marriage a girl has to leave her family and go live with her husband's family (i.e., residence is patrilocal). People in the village cannot marry into their own *gotra* (a lineage derived from a common mythical male ancestor) though marriage has to be within one's own caste. With regard to the family type, 56 households were nuclear families with only one or two generations of family members living together, while 33 households were joint family types, with three or more generations of family members living together.

In Jhirbhanjyang, education among the younger cohort is widespread compared to the older cohort. Of the total households, 24 are headed by illiterate household heads while 52 are headed by literate ones. There are about 10 households whose heads have attained education up to the high school level and even higher. Women head 16 households.[27]

The average land-holding size is around 0.2 hectares (8 *ropanis*) of irrigated lowland (*khet*) and slightly more (9 *ropanis*) of unirrigated upland (*bari*). Only 41 households grow enough food in their fields to last throughout the year. On average, households have food to last for around eight months. There are no completely landless people in Jhirbhanjyang and neither is land ownership extremely skewed. Many households make up for the food deficit by engaging in off-farm activities. While seven households have males who are engaged as wage labourers nearby, as many as 47 households have males working in India who visit the house once or twice a year. Similarly, the men from around 22 households work in other places in Nepal and in five others are engaged in business of some sort. Remittances from male members working elsewhere tends to be an important source of income for people of Jhirbhanjyang.

Aside from remittances the main source of livelihood for people, is agriculture. The staple diet or main crop is paddy, which is the crop grown during the monsoon. It is followed by wheat and maize, which are the winter crops. The agricultural pattern is mainly paddy followed by wheat in irrigated lowland and wheat followed by maize and mustard in unirrigated upland.

Adjoining Jhirbhanjyang are other clusters inhabited by Magars and Dalits. It is from these nearby clusters that the residents of Jhirbhanjyang hire daily wage labourers, particularly during the peak agricultural season.

Ginger (*aduwa*) is the cash crop cultivated in Jhirbhanjyang and the surrounding villages. This crop does not require much water and is grown on unirrigated upland. It fetches up to Rs 24 per kilogram in the markets in Tansen while the farm-gate price is Rs 15. This crop is an important source of cash for the people of Jhirbhanjyang.

Another major source of cash income is the sale of milk. Milk fetches Rs 16 per litre in Tansen bazaar. On average, a household is able to sell two litres of milk daily. There are around 50 households which sell milk all year round. There is thus an average income of about Rs 1000 per month for households in Jhirbhanjyang through the sale of milk alone. There are over 129 cattle and 39 goats in the village.[28]

Vegetables grown in the village include *saag* (a type of spinach), radish, cauliflower, beans, peas and potatoes. These are grown for domestic consumption and not for sale. Fruit trees cultivated in Jhirbhanjyang include orange, lemon, guava, papaya, banana, *jyamire*, and *katar* trees.

In terms of the land tenure system, most of the land is *raikar* where the tiller pays revenue directly to the state. Most of the peasants are owner-cum-cultivators. Only when

they cannot manage all the work in the field, which is the case for a few days at the height of the agricultural season, do they hire extra labour from the nearby clusters. Extra labour, when hired, is paid mainly though not exclusively, on a daily wage basis. The wage rate for men fluctuates between Rs 80 and 100, while that for women is between Rs 50 and 60.

In terms of local history, the village was within the Kingdom of Palpa before the kingdom was annexed into the expanding Gorkhali Empire in 1806.[29] Palpa was a relatively powerful and prosperous kingdom among the 24 principalities of western Nepal. After Gorkhali Empire in 1806 the area began to be administered directly from the capital through a governor. The governor appointed from Kathmandu set up office in Tansen during the 1820s. Urban settlement began to spread and the town of Tansen began to acquire a permanent shape from the 1830s onwards. Towards the end of the 19th century the public square in Tansen was constructed. During the 1920s the palace of the governor, i.e., the *durbar* which today houses important district offices such as the CDO, DDC, and LDO, RWSSP, was constructed.[30]

Located in close proximity to the Tarai and from there to the Indian border, Tansen was an important stop in supplying British manufactured and later Indian manufactured commodities into the western Nepali hinterland. The fact that Tansen was located along this conduit linking the western hills to India was the main reason for its expansion during the nineteenth century, a trend that continued up to the 1960s. The emigration of Newar traders and small manufacturers from Kathmandu Valley to Tansen during this period also contributed significantly to the physical and economic growth of the town. However, with the eradication of malaria in the Tarai during the 1960s and the construction of the Siddhartha Highway linking the Bhairawa and Butwal to Pokhara, Tansen gradually declined in importance. Influential Newar merchant families then shifted to Butwal.[31]

At present, Tansen has been changed from being an important trade centre to the district headquarters of Palpa. Although wholesale and retail firms still exist, they supply manufactured commodities to nearby villages instead of to various districts as they used to supply earlier. As the district headquarters, it houses the district level offices of various line agencies such as administration, local development, police, agriculture, forestry, irrigation, drinking water, health, education, as well as the District Development Committee and municipality office. Tansen also has branch offices of the Agriculture Development Bank and the Rastriya Banijya Bank as well as an army garrison. A United Mission-operated hospital constructed during the 1970s has now become an important feature of the townscape.

The local history of Jhirbhanjyang reconstructed through oral histories has the following outline. The story goes back around 1780 to the time of Tulsi Ram Basyal. Basyal had four sons, of whom the one called Digvijaya was the most illustrious. Most of the Basyal residents in the locality trace their ancestry to this person. Digvijaya, in turn, had four sons: Kamalapati, Dandapani, Trilochan and Tarakeshar. The Digvijaya family owned about 3,000

ropani of land (the average landholding is now 17 ropanis including both irrigated and unirrigated land). However, not all the land was tilled. An important segment was kept as pasture or as forest for livestock to graze in. It is said that after Digvijaya died, his sons fought among themselves and as a consequence their property dwindled greatly. With greater and greater land fragmentation, people in the village began to go out in search of work.

The houses in Jhirbhanjyang are usually two storey, made of bricks and have thatched or zinc roofs. Those made up of baked bricks and concrete are known as permanent (*pakki)* while those made of brick mud and are mud plastered are known as temporary (*kacchi)*. In Jhirbhanjyang almost all of the houses are *kacchi*, though many have replaced the old thatched or tile roof with zinc ones; 36 still have thatched roof while 49 are zinc-roofed. The houses usually have a small clearing in front of the house (*chowk*) for drying grain and for people to sit and work or talk. Children are seen playing in this clearing. There is a small porch before entering the house. Most houses also have a cattle shed (*goth*) nearby. The buffaloes, cows and goats the family owns are usually kept in this shed. Each house has unirrigated land (*bari*) in the vicinity which is used for vegetable cultivation, for fruit trees and for planting crops that do not require much water, such as corn and mustard. The space is also utilised for constructing houses and sheds for cattle.

The kitchen is considered the ritually purest part of the house where lentil soup and boiled rice (*dal-bhat*) is prepared and eaten. Most of the houses in the village have kitchens located there on the ground floor. The kitchen floor is cleaned twice a day after a meal has been served. The women using a broom and water and then mud plaster and cowdung do the cleaning. It is essential to clean the kitchen properly because cooked rice is considered to be *jutho,* or polluting.

The main public area for community interaction is the *deurali* beneath the tree just beside the motorable road. A *deurali* is a place where traditionally porters rest their loads and chat a while before proceeding with their journey. In daily parlance, it connotes a place where people can sit down and discuss matters. This public space is situated just in front of the house of Liladhar Basyal (the former village *panchayat* headman). This area has been plastered with cement and functions as the venue for holding community meetings. There are a few tea and drink stalls close to the primary schools (shown in the lower-centre portion of the map) that are also used as places to gather and talk. It is usually the men who get together and discuss various issues. It is not considered decent for women to go to the *deurali* or tea stalls during such gatherings. Women get the opportunity to talk to each other generally while filling their water pots at tap stands or spring sources and while working in the fields.

The people of Jhirbhanjyang categorise each other in terms of five categories well being. These correspond to local perceptions of poverty and prosperity. At the bottom end of the scale are those considered the poorest. These are those households for whom produce

from farmland is enough to sustain them for only three months of the year after which they have to survive on loans or on the generosity of others. The people in these households often live alone and do not have any education. There are four households that fall in this category. A little better off, but still poor by local standards, are those households that do not have enough produce from their fields to last throughout the year and have to hire themselves out as share croppers or wage labourers to sustain themselves and their families. These people are generally barely literate. There are 20 households that belong to this category. The category above this – not poor by local standards but not well off either – are those who make ends meet through produce from cultivated fields supplemented by remittance from India. People from these households are either literate or have attained primary school levels. As many as 35 households belong to this category. Slightly well off households are those that have enough cultivable land to produce enough or even a little surplus and also have other sources of income. The household head or male children have completed their schooling or have had higher education. There are 17 households that belong to this category. Those considered well off in Jhirbhanjyang are those who have enough cultivable land in the village have some land in the plains and produce surplus food. The household heads are well educated or have sons who have completed their schooling or have a college education. They also have family members in government positions. There are 12 households that belong to this category.

With regard to local politics in Jhirbhanjyang, both the chairmen of wards three and nine where the bulk of the users reside are affiliated to the Communist Party of Nepal Unified Marxist-Leninist (UML). In Chappani VDC as a whole the UML is strong; both the chairman and the vice-chairman represent this party.

WATER AND THE LOCAL HILL-HINDU TRADITION

In the midhills of Nepal various sources of water are used for domestic purposes. For drinking, *dhunge dhara* a (spring source with a stone carved spout), *kuwa* (a spring source covered and collected in a small pond), *padhero* (an uncovered spring source), *inar* (a man-made well usually lined with brick), and *kal dhara* (a piped tap) are generally used. For bathing and religious purposes, *nadi* (a river), *khola* (a stream), *kunda* (a spring water source in a pilgrimage site) are employed. For other household purposes such as cleaning utensils and washing clothes, *pokhari* (a tank or pond usually of still water collected from excess water during the rainy season or from the run-off of another source), *khare* (a stream active only during the rainy season) and *kulo* (a temporary irrigation ditch) may be used.[32]

The use of water from these different sources is not exclusive, and different sources are used depending on the purpose for which water is required. A few of these sources are also used simultaneously. Water use from different sources for various purposes also

reveals a hierarchy of use. Sources which have the cleanest water being limited for religious, drinking, and cooking purposes while for animals and washing clothes and utensils water from less clean sources are also used.

Two words are used to refer to water in Nepali – *paani* and *jal*. Among these two, *paani* is the more common and is used in reference to the mundane uses of water while *jal*, which is less frequently used tends to be used in reference to the religious use of water.

SOURCES OF WATER AND THEIR SPECIFIC USES

In Jhirbhanjyang, apart from the four still partly working but unreliable taps, there were over ten different sources from which the people of the nearby clusters fulfilled their daily requirements. In terms of usage, the water sources are *sarvajanik* (public) and not *byaktigat* (private), even though they may be located on private property. When a water source falls on private property, the owner does not have to pay any taxes for its use and nearby residents have unhindered access to it as well. However, the actual use of the water source by nearby households depends upon the amicability of their relationship with the concerned household. What follows is a short description of the different sources of water in and around Jhirbhanjyang, beginning with the sources in the east and moving westward.

1. ***Pari Mathillo Dharadi*:** About 20 households living in the cluster of Pipalpokhara use this *kuwa* (spring source) regularly. Even during the lean period, i.e., during the months of March, April and May, about 1000 litres[33] of water is available every day. Water from *Pari Mathillo Dharadi* is clean, it is used only for drinking purposes. Since this water is considered to be ritually pure, it is also used for funeral rites. The forest around the catchment has been preserved. A small tank and a tap have been constructed at the source point.
2. ***Pari Tallo Dharadi*:** The water that flows down from *Pari Mathillo Dharadi* is accumulated in a pond known as *Pari Tallo Dharadi*.[34] The water is turbid and has a foul smell. The residents of clusters Buddhakot and Pipalpokhara use the water from *Pari Tallo Dharadi* mainly for washing clothes and for meeting the drinking water needs of their domestic animals. People from the cluster Tallo Tole, use the water from this source to meet even their drinking water requirements.
3. ***Rap Ko Padhero*:** This uncovered spring source which is located some 300 metres below Buddhakot, is used mainly for drinking by the people of Barangdi ward number eight. In times of emergency, the people of Buddhakot also use it but they do not do so generally because the scheme is located downhill, which means that after filling a pot *(gagri)* with water people have to make a steep uphill climb. Around eight years ago, the government provided support to protect the spring source. A small

forest remains around the source.

4. ***Dharapani*:** Water from this spring source is used for drinking by the people of Barangdi ward number eight. Dharapani is an alternative source of drinking water for the people living in Chappani wards three and nine as well. The source is about 300 metres below those clusters. The water from this source is cool and clean throughout the year. People also wash clothes here because water flows continuously from one tap. A tap and a tank were constructed in 1995 with assistance from the Rural Self-Reliant Development Centre, a national NGO active in the district.
5. ***Daute*:** This is the spring source that fulfils most of the domestic water requirements of the people of Chappani ward number three. About 30 households located in the vicinity use water from this source. Even during the lean period, there is an uninterrupted flow approximately half an inch in diameter. The local residents have constructed a small pond below the source to meet the water requirements of their animals and for washing clothes. The water also flows down from the pond to irrigate nearby fields. There is an agreement among the people using this water to clean up *Daute* once in a while, but the agreement is not seriously followed.
6. ***Pahiro*:** About 10 households from Chappani ward number nine use water from this source regularly. *Pahiro* is located about 100 metres away from the settlements and provides 1,000 litres or so daily even during the lean season. The forest around the source has been severely depleted and there are at present no trees in the vicinity.
7. ***Dhab*:** This spring is located in Barangdi ward number eight. Around 60 households of Barangdi use water from this source to meet their domestic water requirements. When Jhirbhanjyang people cannot use *Daute* or *Pahiro* because of depletion, they go to *Dhab* instead. They do not like going there regularly because of its distance. *Dhab* is located about 250 metres away from the settlements in Barangdi. Even during the lean period, about one inch of water flows continuously. The water from this source is also used to irrigate nearby wheat fields.
8. ***Badh Padhero*:** This spring source lies in Chappani ward number three. About 10 households from Gwasing village use the water from here. About 1,000 litres accumulates daily, even during the lean period. In the past, some money from the VDC and local labour contribution was invested in source protection.
9. ***Bhattarai Padhero*:** Some 12 households from Chappani ward number three and Barangdi ward number eight use this spring located about 150 metres away from the settlements. Around 1,200 litres of water accumulates here every day. In the past some money from the VDC and labour as the people's contribution went towards installing a tank and a tap in *Bhattarai Padhero* as well as for source protection.

10. ***Liden Khola:*** The name of this source suggests it is a stream but it is actually a spring. The water from Liden Khola is used to meet the water requirements of the cattle by the people from eight households of Barangdi ward number eight and ten households of Chappani ward number three. Even during the lean period, some 700 litres of water can be collected from this source. The water from here flows down to irrigate some fields where villagers generally grow vegetables.

Apart from these sources, people from Jhirbhanjyang also go to Bhalu Khola, a stream source, to wash clothes and to bathe during the lean season. They also water and bathe their animals there.

What the above account reveals is that households generally use water from more than one source for their various domestic water requirements. The fact that households generally use water from more than one source should not be construed to imply that water availability is not a problem in the area. It is, and more so during specific times of the year. Although the spring sources do have water, the quantity available throughout the year at those sources varies considerably. During the rainy season (i.e., the months of June, July, August and September), the nearby spring sources have ample water. These continue to be recharged through the percolation of monsoon rains and through occasional showers up to February. The months of March, April and May, however, have little precipitation and consequently the spring sources do not get sufficiently recharged. Nearby sources dry up and users have to travel further and further away to get to larger spring sources which may still contain some water. Thus during summer when the demand for domestic water reaches its peak, the supply gets increasingly depleted, which further increases the drudgery associated with fetching water.

Prospective users were keen on the piped water scheme proposed by a donor funded project because the tap stands would be relatively close to their homes than the spring source. The piped scheme would also have a more reliable quantum of supply both in terms of daily access and year-round availability. This, in turn, would mean less drudgery for those who have to collect and transport water – namely women and young boys and girls. Though the dry taps in their village remained a vivid example of how things could go wrong in a scheme initiated by external agencies they presumed that this time the intended results would ensue.

QUALITIES OF 'GOOD' WATER AND TYPOLOGIES OF WATER

The criteria used for judging the quality of water are turbidity, local temperature and taste.[36] The water should look clean (*sapha*) and clear (*sanglo*). It should not be turbid (*dhamilo*) with mud or have other particles in it. Similarly, the temperature of the water should be

cool, and particularly so during summer. The water should also be pleasant and thirst quenching. Upon tasting, it should not feel uneasy in the mouth (*tartamaudo*), but should taste sweet (*mitho*) even though this quality of sweetness is elusive.

A major typology of water has to do with the distinction between fresh (*sazi*) water and stale (*basi*) water. According to people in Jhirbhanjyang, it is important that the water be fresh (*sazi*). Water at the source such as a spring or a tap is always fresh. But in collecting and containing water, it 'gathers' thereby becoming stale (*basi*) and losing its positive qualities. Stale water cannot be made fresh, hence freshness can be guaranteed only by changing stored water at regular intervals. The pot in which drinking water is stored should with cleaned by ash once a day in the morning before fetching water. In Jhirbhanjyang, since water is generally scarce, the stale or *basi* water is not simply thrown away. It is poured into a drum usually placed in the yard in front of the house, and the water is used to wash one's feet before entering the house, to wash utensils, to give to cattle, etc.

Another typology associated with water is the distinction between hard (*kada*) and soft (*naram*) water. Water found in its natural form is hard (*kada*) and when boiled it becomes soft (*naram*). When a person has indigestion or is ill he or she should consume soft or *naram* water, but not at other times though because that would reduce the digestive capacity of the system. Drinking water found in its natural form makes a person strong.

In contrast to pure (*chokho*) water is polluted (*jutho*) water. This water refers to either ritually polluted or physically unclean water and often the distinction between the two is blurred. Polluted water from cleaning rice, lentil, vegetables, etc., is collected in a pot in the section of the kitchen that is ritually impure. This is usually at the other end of the hearth. It is stored in relatively large pots called *dekchi*, *bata* or *taula*. Care is taken not to let this water pollute the clean water. In Jhirbhanjyang this water is not thrown away but poured into the small kitchen garden adjoining the house.

Another typology has to do with the distinction between ritually pure (*chokho*) and ritually polluted (*bitulo*) water. In its natural undifferentiated state, water is intristically pure. However, since qualities can be transferred through the medium of water, it becomes liable to pollution. People in Jhirbhanjyang recognise both temporary and permanent sources of defilement. Periods of temporary pollution include early morning before ablutions, menstruating women, mothers in the first forty days of postpartum, and families in mourning. Permanent pollution is a fact of life for Dalits[36]. Once water is polluted from these sources it cannot be rendered pure again, it must be discarded. It may not even be used for other purposes. Therefore utmost care is taken not to touch anyone while bringing the water home from the taps or spring sources. Thus drinking water not only has to be fresh (*sazi*), but pure (*chokho*) as well.

The source from which the 'untouchables' get their water is different from where the rest of the villagers get their water. The untouchables do not live in Jhirbhanjyang but

in a hamlet called Tallo Tole, which is located at a lower altitude than other clusters. They use water from Pari Tallo Dharadi, a pond in which water accumulates from the discharge and run-off from the spring source located slightly higher, the Pari Mathillo Dharadi. The quality of water at this source is not good and residents of other hamlets such as Buddhakot and Pipalpokhara use it mainly for washing clothes and for meeting the drinking water needs of their domestic animals. The people of Tallo Tole, however, have no other source apart from Pari Tallo Dharadi. Not only are other sources relatively far from where they live, they are not allowed access to them. Around ten years ago there was a government intervention to protect the source and supply water through pipes. Some money was disbursed through District Panchayat but due to the inadequate amount of investment the scheme had never been properly executed and soon fell into disrepair.

When an 'untouchable' person is engaged as a tiller – which is often the case in Jhirbhanjyang – he is given daily wages and a meal which is served outside the house. After eating the food, he has to wash the utensils himself and dry them in the sun. After they are dry, the utensils are wiped with a clean cloth and only then do members of the household use it again.

STORING WATER AND ITS USE FOR SPECIFIC PURPOSES

In Jhirbhanjyang, the *chokho* and *sazi* water is stored in a bronze pot *(tamako gagri)*, in an aluminum pot or in an alloy pot – preferably in that order of priority. The *gagri* or the pot for storing water, has a small opening and a large body. During summer, drinking water is poured into a smaller clay pot (*matoko gagri*) because water stored in clay pots stays cooler. The *gagri* is placed in that section of the kitchen that has to be ritually pure, near the cooking hearth. The cleanliness of water is bound up with the cleanliness and purity of the household. This water is used for drinking, for washing hands before and after eating rice (*chuthna*), for cleaning rice and lentils before cooking and for putting into rice, lentil and vegetables during cooking. This water is also used for religious purposes such as bathing idols and offering water to gods. For drinking, the water from the pot (*gagri*) is transferred to a smaller pot (*karuwa*) and poured into the mouth. It should not be touched by the lips because saliva is considered to be a grave source of pollution. In case the pot touches some one's lips, then all the water has to be thrown away and the pot cleaned before using it again.

According to local residents, for ritual bathing *snan* too, pure and fresh water should be used. A ritual bath is taken daily by older men and women, while younger men and women take only on special occasions. A ritual bath can be taken near the spring source or within one's courtyard. It is taken in the morning, usually before eating any food. Whenever the bath is taken, it should be done facing eastwards towards the sun. If the bath is being

taken within one's courtyard, then there is a specific place for this. Each household has a plant known as *tulsi* that is associated with Lord Vishnu. A small chair-sized plateau known as *mahiro* houses the *tulsi* plant. On the western side of the *mahiro* is a small platform. The person taking the ritual bath stands in a semi-erect position on the platform and pours a few jugs (*lota*) of water over his body while chanting the *gayatri* verse (*mantra*) simultaneously. Right after bathing, Surya, the sun god, is propitiated through certain invocations and gestures.

The privilege of taking a ritual bath in one's own premises lies with male household heads. Females who do not want to bathe in public can do so in the privacy of their courtyards but they have to bring the water themselves or get their children to bring it for them. Young males generally bathe in the tapstands during early morning when water comes for a brief while or go to spring sources.

Water is used for other domestic purposes as well – namely for cleaning the house, rinsing *pirka* (short wooden stool used for eating), etc. To clean a house (*ghar lipne*), fresh and clean water is mixed with red mud and cow dung, this solution is then plastered in the floor of the house every morning. The kitchen is also cleaned in the same manner in the mornings and in the evenings after meals. After each meal, *pirka* in the kitchen are rinsed with fresh, pure water and dried by placing them vertically for an hour or two.

Another custom known as *goda pani dhune* (literally, washing feet with water) also entails water use for ritual purposes. Some households in Jhirbhanjyang engage in this activity, which involves a wife ritually cleaning the feet of her husband before a meal and ritually sipping it. Similarly, before eating food, water and rice from one's plate is offered to the ancestors and gods.

Water for washing hands and feet, washing utensils, and feeding animals is stored in a big pot or drum placed at the side of the courtyard. This pot or drum is usually located between the house and the animal shed (*goth*) and is usually covered. A small jug is placed in the drum for using the water. Soon after arriving home from outside, hands and feet are washed with this water by using the jug before going upstairs into the rooms. This pot or drum is cleaned once every week or ten days. The used water is then drained into the nearby kitchen garden.

For defecation a small pot (*lota*) is used. The pot can be of aluminum, tin or plastic and is placed near the drum. Water from the drum is poured into this *lota* through the jug. The *lota* should not directly touch the drum. An overwhelming majority of households go to the nearby unirrigated upland (*bari*), which is about a minute walk away from the house, to relieve themselves. The trees and the bushes generally provide privacy during such occasions. Only the left hand should be employed during urination and cleaning up after defecation, never the right hand. After defecation the left hand is washed with ash or earth or soap. The right hand is used for eating, writing, and conducting religious rituals

(*puja*) and other purposes. The left hand is regarded as the ritually impure hand, while the right one is regarded as ritually pure.

Indigenous treatment of water

Water is treated primarily in two ways – through the preparation of soft (*naram*) water and through the substitution of stale (*basi*) with fresh (*sazi*) water.[37] Water found in its natural form is hard (*kada*) and when boiled it becomes soft (*naram*). Drinking water in its natural form makes a person strong, though it may also be difficult to digest. Water becomes light or thin upon heating and this soft water is more digestible than naturally occurring hard water. The procedure followed in preparing soft water is to bring the water to boil and then to remove it from the fire. This warm water is given to small children, to those who are ill or to those who have indigestion problems.

Another method of treatment is to substitute stale (*basi*) with fresh (*sazi*) water daily. Once water is stored overnight, it becomes stale and so has to be replaced by fresh water. The stale water then is emptied into a drum, the pot is rinsed both inside and out and then filled with fresh water. Fresh water does not purify stale water rather fresh water replaces stale water in its entirety.

Water and pilgrimage

Pilgrimages undertaken by people from Jhirbhanjyang are more often than not, associated with a bath. Pilgrimages are undertaken on special occasions to enable people to bathe in specific locations deemed holy. Bathing at definite sites during specific festivals is considered to accrue great merit since it washes away accumulated sins and transgressions. Flowing water in the form of rivers is regarded as being the purest water, purer even than spring sources. And when high states of purity are required (such as during the occasion of Janai-Purnima, or the thread changing ceremony for men, and *Rishi Panchami* and *Teej* i.e., specific festivals associated with women people bathe in rivers. The Ganga is regarded as being the purest among rivers. However, when inhabitants of Jhirbhanjyang mention the Ganga, they refer not only to the actually existing river that flows through India, but to the nearby big rivers as well. Rivers are capable of capturing all pollution and the rites of the most severe pollution – that of death – are undertaken at riverbanks. Even 'untouchables' cannot pollute flowing water.

The specific pilgrimages that the men and women of Jhirbhanjyang undertake are briefly mentioned below.

1. Bathing at Ramdi on the banks of the river Kali Gandaki during such occasions as Maghe Sankranti (the first day of the month of Magh, which falls in January-February), Thulo Ekadasi (a special holy day associated with fasting), etc. The site lies about a two hour walk from Jhirbhanjyang.

2. Bathing at Dailatung on the banks of the Kali Gandaki. It takes about half a day to go there and come back. Bathing is done usually on Ekadashi (a specific holy day that comes once a month according to the lunar calendar). If someone in the village dies, the cremation is also undertaken there.
3. Bathing at Ridi, the confluence of the rivers Ridi and Kali Gandaki. During this occasion, the temple of Risheswar is also visited. The trip takes two days.
4. Bathing at Rani ghat, also on the banks of the Kali Gandaki. People also visit the famous historical palace there on such occasions.
5. If people have the time and the resources, they visit Muktinath high up in the Himalaya. One of the tributaries of the river Kali Gandaki originates here. The pilgrimage involves bathing in the many taps that are situated at Muktinath. The trip takes about nine days altogether. People go there during Chaite Dasain and Dasain. This trip is undertaken once in a lifetime.

The majority of Jhirbhanjyang residents generally undertake a pilgrimage in the first four sites; only if the resources permit and if their health is good do they undertake the last one. The main intention of these pilgrimages is bathing so as to wash away the sins and not visiting the temples of gods or the tombs of past saints. Most of the important religious sites for the people of Jhirbhanjyang are in the vicinity and not in the famous religious centres of India or elsewhere in Nepal.

Water, *bikas* and happiness

The availability of water in general and domestic water in particular is loosely associated with notions of bikas[38] (The Nepali rendering of 'development') and *sukha* (happiness). The dominant image of the residents of Jhirbhanjyang with regard to their village is that it is *pichadieko,* or backward, or one that has little *bikas* in it.

Young high school educated women and men think of Jhirbhanjyang as is *pichadieko.* When they mentioned their *pichadieko* nature it was in comparison and contrast to other villages nearby and not in terms of abstract parameters or some decontextualised index. It was often compared and contrasted with Madan Pokhara, a nearby village known for its progressive people:

> Jhirbhanjyang is *pichadieko* because villagers are not educated and, consequently, they have not able to bring *bikas* to the village. There are difficulties in having access to drinking water and only now is the village getting linked to by a road to Tansen, while Madan Pokhara did these things a long time ago. Only recently has a high school opened up in the village and there are as yet no irrigation facilities. There are no good people in the area and there are only *jali-phataha* (frauds who cheat ordinary villages) in the

> village. However, in spite of these shortcomings, the village is still characterised by good *hawa-paani* (climate) and beautiful scenery.

The above passage indicates the pervasiveness of the ideology of *bikas*. In daily usage the term *bikas* becomes the idiom through which the relationship between local communities and other places within the country, or for that matter, within the district is expressed. There are places of much *bika*s, little *bikas*, and no *bikas*. If Jhirbhanjyang is identified as a place with little *bikas*, Madan Pokhara is seen to be a place with lots of *bikas*. Thus *bikas* is something quantifiable. It is also something that comes to local areas from elsewhere and is not produced locally. The main reason why the village does not have much *bikas* is because there are no good people in the village who strive for it. In spite of faring poorly in matters of *bikas* though, the physical environment of the village is pleasant.

Among the educated youth, the term that is in vogue is *bikas-nirman*, which presumes such facilities as drinking water, irrigation, road, electricity, schools and health posts. These services, which theoretically are to be made available by the State, are aims to be striven towards, infrastructure to be made available. Only educated people can do this – not the idle tricksters of the village.

Among less educated (or even illiterate) older women and men, the ideas of *bikas* and *sukha* are intermingled:

> Without work, *sukha* is not possible. In Argheli there are three harvests. People just don't have any leisure. Women really work hard in Argheli. Actually the thing that makes *bikas* possible is water. Water is needed both for irrigation and for drinking. Here, in our village, there is no facility of water. Only paddy, grain and maize grow here. In Madan Pokhara things are so different. If people do things, then there will be *bikas*. If not, even if there is water, nothing will happen. Without doing something, there will be no *bikas*. If there is *bikas* then people can eat the produce from their own land. If not, they have to buy grain from the market, and have to work for others. There is no *sukha* without working. *Sukha* is when the woman asks for something (essential for household operation) and the man makes it available. Then there would be no anxiety in the minds of women about fulfilling household duties. But a woman has to prepare things. A woman who cannot do things is a useless woman.

In this narrative also, Jhirbhanjynag is identified as a place with little *bikas*. It is compared and contrasted with Argheli (an area within the same district that is a few hours' walk away), which has much *bikas*. The reason Argheli has lots of *bikas* is because it has perennial sources of water. Water, however, is seen as a necessary condition and not a

sufficient one for *bikas*. For *bikas* to occur, people have to work to bring water to proper use. The example implies that in availing water to irrigate their fields, the people in Argheli work more than those in Jhirbhanjyang. Contrary to the assumptions of some, *bikas* is associated with having enough produce from one's farmland to survive, i.e., self-sufficiency and not having to work for others to survive. The narrative then goes on to discuss *sukha*. On the whole, the passage seems to suggest that ideas of *bikas* among the older generation – among those who have not received formal education – is close to the idea of *sukha*. Contrary to what some seem to suggest, where *bikas* for local people is associated with lack of work,[39] the above passage suggests an intimate association of both *bikas* and *sukha*, at least among the local older folk, with work.

Quantity of water used daily in Jhirbhanjyang

The quantity of water used daily for domestic purposes in a family of four in Jhirbhanjyang are summed up below. This is computed for a time of the year when the temperature is temperate – not for the hot or cold seasons, when water requirements would be higher or lower respectively. The table illustrates the various purposes for which water is required as well as the quantity of water required in litres.[40] The total in terms of the household and for each individual member is summarised at the end of the table.

For a household with four members, the total daily water requirement is 126 litres. For an individual the per capita daily consumption works out to 31.5 litres. The average minimum daily requirement set by the state is 45 litres per person per day.[41] What this indicates is that a person in Jhirbhanjyang consumes much less water for domestic purposes than the norm set by the state. What the table also indicates is that drinking water constitutes only a small portion of the total water required for domestic purposes. Most of the domestic water is consumed by cattle, followed by for washing clothes, washing and preparing food, daily ablutions, washing hands and feet, bathing and cleaning utensils. Water for religious purposes such as for *puja* or for ritual bathing (*snana*) involves even less water than drinking does.

Aside from the figures illustrated above, an additional 18 litres is required every day for the cultivation of vegetables. However, water is used for vegetable cultivation only when it is available and not by diverting water used for other purposes.

SCRIPTURAL CANONS, STATE LEGISLATIONS AND LOCAL TRADITIONS

There are continuities between the written Hindu traditions dealing with water and local traditions dealing with the same in Jhirbhanjyang. This is revealed, for instance, in the characteristics of 'good' water as mentioned in the *dharmashastras* and how water is generally gauged to be 'good' in Jhirbhanjyang. *Tirtha,* or pilgrimage, in Jhirbhanjyang

seems to be very much associated with bathing – something in line with what the written traditions say about pilgrimages and the special merits attained by bathing. At least among the older folk, the procedures mentioned in the *dharmashastras* seem to be widely followed in undertaking daily baths or *nitya snana*. Similarly, what the *dharmashastras* say with regard to sources of pollution and the use of water during such occasions also largely prevails in Jhirbhanjyang, with people recognising both temporary and permanent sources of defilement and dealing with them accordingly. However, the continuities between certain caste practices prevalent in Jhirbhanjyang such as not allowing Dalits access to water sources and the caste and water pollution instructions of the written texts such as *Manusmriti* are weak and tenuous. The local practices in Jhirbhanjyang are not based on formulaic knowledge and what constitutes authentic practice varies across households. Moreover, even well informed practitioners are not able to trace the specific injunctions dealing with the various uses of water to religious texts.

There are also disjunctions between the written tradition in Hinduism and oral traditions in Jhirbhanjyang. For instance, s*nana* as a ritual bath is yielding to what we understand as a normal bath. The younger generation of men and women no longer engaged in *snana*. They either do not engage in *snana* daily (doing so only during specific holy days) or prefer a normal bath when water for the purpose is available. Similarly, there are certain typologies such as those dealing with soft and hard water that cannot be traced to the *dharmashastras* and could be based on local customs.[42] The Bahun residents of Jhirbhanjyang do not bathe two times a day as instructed by the *dharmashastras* but only once a day. While the *dharmashastras* instruct the ceremonial sipping of water

TABLE 1
QUANTUM OF WATER USED BY A HOUSEHOLD IN JHIRBHANJYANG IN A DAY

	Usage	Amount litres
1.	Drinking	6
2.	In preparing and cooking food	12
3.	Puja (in worshipping dieties)	1
4.	Ritual bath	4
5.	Daily ablutions, brushing teeth, washing face	10
6.	Washing hands and feet after coming to house	10
7.	Drinking water for cattle	36
8.	Washing clothes	18
9.	Bathing	10
10.	Washing utensils	9
	Total household use	126
	Individual per capita litres	31.5

Source: Primary Data Collection

(*acamana*), there was very little indication of this in the daily lives of the people, except during religious rituals (*puja*). Some of their practices even runs counter to the instructions of the *dharmashastras* such as not throwing away stale water and re-using it for washing hands and feet or for other purposes.

These discontinuities and disjunctures can be attributed to specific local conditions and the behaviours these give rise to. In Jhirbhanjyang knowledge and practices dealing with water are largely locally constructed. They reflect considerable influence of local customs as well as of influences emanating from more recent modernist practices. This observation indicates that local traditions tend to be varied, hybrid and resilient.

On the whole, while the *dharmashastras* instruct a profuse use of water in order to maintain ritual purity, people from Jhirbhanjyang use water prudently. This is primarily because water is scarce in Jhirbhanjyang. This may also be due to the fact that in a cool climate such as Jhirbhanjyang people do not really like coming into contact with water too frequently. Perhaps both these factors work simultaneously to limit the quantity of water used daily in Jhirbhanjyang.

A disjuncture is also apparent between the scriptural (*dharmashastrasic*) view of water and that of modern legislation. While the *dharmashastras* associate water with cleanliness and ritual purity, and leave the ownership of water undefined, modern legislation views water as a resource, and vests its ownership in the State. Referring to the convenience and economic benefit of the general public as its rationale, the State has increasingly expanded its role in controlling and managing this national resource. Associating water with physical health, it simultaneously disassociates water from ritual purity. Needless to say, the orientations of the *dharmashastras* and modern legislation pertaining to the role of water are based on quite different value premises.

The local traditions relating to water reveal both continuities and discontinuities with ecclestical canons as well as with modern legislation. They include elements of modern legislation through the pervasive influence of the ideology of *bikas* which the State itself has propounded over the years. Local traditions related to water are not something pristine, indigenous and derived entirely from written traditions since the local, in a sense, has already internalised, though to varying degrees, the global.[43] This is not done through abstract parameters and indexes as the narrative indicates but through a comparison with other nearby localities having more or less *bikas*.

The history of water in Nepal can also be read as the history of the secularisation of water. Before development discourse shaped common sensibilities, water was viewed as something that cleaned as well as purified. Water was not only a liquid that cleaned by detaching and purging filth, it was also something innately religious in that it purified a person from pollution. The organic processes of life such as eating, urinating, defecating, copulating, menstruating, birth and death were perceived as polluting and contact with

these people and phases of life associated one with pollution, which could be overcome by a ritual bath. With foreign aid as the handmaiden of development in shaping new sensibilities, water has been increasingly seen as something that promotes cleanliness and thereby physical health. Its association with and connotations of purity have been driven underground. This mindset has simultaneously led to water being viewed as a resource whose ownership is vested in the state, while in the past the ownership of water remained undefined. With the ideology of development increasingly shaping public perceptions of water as *jal-srot* (water as a resource), water as *pani* and *jal* has been further drowned from public memory. In short, the ideology of development has led to a significant secularisation of water.

NOTES

[1] 'Water' Systems of Religious and Spiritual Belief, *Encyclopaedia Britannica* Inc. (1991).

[2] Doniger, and Smith (1991).

[3] Baartmans (1990).

[4] *Ibid*.

[5] This is referred to as *sucaya pavaka*. Kane (1930), p. 321.

[6] Baartmans (1990).

[7] Kane (1930), p. 555.

[8] Kane (1930).

[9] The references to water in *History of Dharmashastra* are compiled from various religious texts such as *Vishnudharma sutra, Nrsimhapurana, Brihat Samhita, Laghu Harita, Kurmapurana, Laghu-Asvalayana, Manusmriti, Gobhilasmriti, Daksya, Veda-Vyasa smriti*, and *Sankha smriti*. Water, it should be noted does not constitute the only means for purification and the *dharmashastras* note other means for purification as well. These are knowledge, inner heat, fire, sacrificial food, earth, thought, cowdung, wind, rituals, sun and time (*Manusmriti*, 5:105).

[10] Kane (1930), p. 664.

[11] *Ibid*.

[12] *Ibid*.

[13] 'Hinduism' The New Encyclopaedia Britannica (Macropaedia) (1989).

[14] Doniger, and Smith (1991).

[15] Rangarajan (1992). The treatise was compiled by Chanakya/Kautilya/Vishnu Gupta who was active as the adviser to the first Mauryan emperor. *Artha* refers to both the source of livelihood and to meaning. It refers to the territory and its inhabitants and as such refers to the wealth of the nation.

[16] *Ibid*.

[17] The link between the Old Mulki Ain and *Manusmriti* is weak and tenacious. While the Old Mulki Ain classifies castes according to the water line, such a concept is conspicuous by its absence in the *Manusmriti*. The claims of scholars such as Khanal(1973) and Adhikari (1984) who are of the opinion that the Mulki Ain is based primarily on the *Naradsmriti*, appears to be more plausible. See also Pradhan (2000).

[18] The national caste hierarchy was not based entirely on the classical *varna* model though. Hoffer (1979). See also Levine (1987).

[19] A clarification following this clause says that traditional behaviour in a temple or a religious centre will not be deemed discriminatory.

[20] *The Constitution of Nepal 1990,* Part 1, Clause 4.1.

[21] Water Resources Act 1992, (1992).

[22] Sharma (1996). See also Burghart (1996b).

[23] *Water Resources Regulation 1993* (1993).

[24] HMG/N (1998).

[25] Once a Brahmin widow is re-married she becomes lower in ritual status.

[26] This anthropological term primarily refers to the *gotra* and *kul* kinship relations among high-caste Hindus.

[27] Women heading these households are widows and wives of migrant labourers.

[28] The figure for cattle has been mentioned in the feasibility reports of 1997 undertaken and compiled by the project.

[29] Ghimire(1988).

[30] Kasajoo (1988).

[31] This is discussed in detail in Blakie, *et al.* (1980).

[32] The different sources of water in the hills have been discussed by Bennet-Campbell (1973).

[33] 'Litres' in this context is a rough figure. The amount of water available in the sources was not actually measured.

[34] While *mathillo* in Nepali refers to upper, *tallo* refers to lower.

[35] The categories of what constitutes good water in this instance is not as exhaustive as for instance as that of the Maithil people of Janakpur, a town in the eastern Tarai, studied by Richard Burghart during the late 1980s where drinking water was evaluated according to seven criteria: taste, turbidity, temperature, freshness, digestive properties, habitual usage and purity. Burghart (1988).

[36] The sources of temporary and permanent pollution have also been observed and commented at length by Lynn Bennet in her study of Brahmin and Chettri women in the outskirts of Kathmandu valley during the late 70s and early 80s. See Bennet (1983).

[37] Richard Burghart in his study of water use in an eastern Tarai town had also noted a third way of treating water indigenously – cleaning the water source and decontaminating the water there. *Ibid* Burghart (1988). This, however, was not observed in the research site perhaps because the spring sources do not require cleaning, as do open masonry wells. Burghart 1996b.

[38] The meaning of *bikas* in Nepali society and the meaning of development in international institutions differ but are not separate. Embedded in the Nepali usage of *bikas* is the representation of society through an implicit scale of social progress. See Pigg (1992) p. 495.

[39] The fact that *bikas* is associated with work in the minds of local people, though not working for others, further substantiates the observation made by Stacy Pigg. 'Whereas the discourse of *bikas* characterises the generic villager as a person who does not understand, people in rural areas speak of places of 'much bikas' as places where 'people don't have to carry loads. … The picture of carrying loads can be a picture of work, but it is often a picture of carrying someone

else's load' (Pigg, 1992). Argheli was characterised both as a place with much *bikas* and where people work harder – not for others but for own selves.

[40] The various consumptions of water was actually measured in litres in one household.

[41] The average per capita water consumption of 14 Finnish water works was about 45 litres per day in 1915. During the 1990s the per capita water consumption in Finnish cities such as Helsinki, Tampere and Turku stabilised at around 300 litres. Katko (1997) page 45 and 46.

[42] These could, however, also be derived from *Ayurveda*, the ancient Indian medical system.

[43] Pigg brings out this point forcefully in her discussion on development's conceptualisation of a villager's culture and the villager's conceptualisation of development. See Pigg (1997).

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PEOPLE, POWER AND RIVERS: EXPERIENCES FROM THE DAMODAR RIVER, INDIA

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Rivers tell stories – since they connect people they cannot fail to – and they can tell the biggest stories, of war and invasion, and the clash of races and theories.

(Haupt, 1998)

ABSTRACT

Local communities living in river valleys have perceived rivers in multiple ways at different points in time. Experts and water planners, on the other hand, have treated rivers only in a utilitarian fashion as objects, as the carriers of a resource that must not flow into the sea as waste. The diversity of representations gives rise to the question whether or not rivers exist at all; perhaps they are just social and historical constructs. The visual simplicity of the physical body of a river, however, tends to suppress discursive constructions of it. Because a river appears as a natural object, discussions about it and the plethora of images that describe it tend to be ignored. This produces confusion about what a river is, what it should be, who should to have control over the resource that it carries and how that resource could best be utilised. The focus of this paper is how rivers have been conceptualised in postcolonial India, and how the modernisation and development agenda of the state have created binary oppositions such as traditional vs. developmentalist, anti-dam vs. pro-dam, local vs. global, bio-centric vs. anthropocentric, and small vs. large. Underlying this polarisation are the notions that all that is scientific is good; that a state owns its rivers and their water; and that it is the duty of the state to protect its land and people from what it sees as the aberrant and uncivil behaviour of rivers. The paper discusses how state control of rivers has denied local communities their traditional rights over local resources. It uses the example of the Damodar River of eastern India to show how the modern state has tried to turn rivers into resources and establish their economic dimension as the dominant one. In the process, the perceptions of local communities have changed. The conflicts created among groups as a result of changing viewpoints have heightened social inequalities.

RIVERS: REAL AND IMAGINED

Haupt, an Australian journalist, spent several year spreads over a couple of decades in the Soviet Union studying the Volga River. During his visits, which were separated by gaps of lapsed time, he noted how the Volga, which was once a lively river carrying people and goods up and down its course and across the country connected different cultures and resource regions changed. Upstream dams and diversion channels gradually converted the river into a mere trickle, a sad remnant of its glorious past. The last boat to Astrakhan sailed and then the river died. The story of the Volga is not only one of its kind; it has been repeated in almost every country across the globe. This paper describes river planning in postcolonial India. It considers how rivers and their flooding have been conceptualised and how such representations have stripped the rights of both rivers and local communities by turning these rights over to the state.

The question we start with is philosophical: does river really exists or is it only what we imagine it to be? Rivers are embodied entities that can be seen, felt, touched and traced on a map. On a map, a river describes a valley, spread out before the reader's eye. This visual simplicity is the reason behind the popularity of using the images of space and numbers to depict rivers; they have become a quantitative construction. These quantitative characteristics of rivers – as different and visible as they undoubtedly are and have been – are lived out in a physical body. These physical images of river often makes us forget that definitions of rivers are actually made up of discourses and narratives, which in turn affect policies and behaviour, and become implemented in ways that directly affect the physical bodies of rivers. The more natural an object appears to be, the less obvious the discursive construction is, and this is certainly true in case of rivers.

As objects of analysis, rivers do not occur as wholly natural phenomena, but as partial construction of the discourses that describe them. We have a plethora of images and different discourses about a river reflecting our confusion about what a river is, what it should be, and what needs to be done, if we want to get the most out of the water it as a resource carries. It is possible to see rivers in different ways, a fact which attests to the social and historical construction of rivers. The Indian state including its fleet of officials, technocrats, and local communities, has viewed rivers in different ways and the conflicting ways are now the subject of active academic inquiry. But is there a correct way to imagine rivers? The Damodar River of eastern India and how different groups have viewed it is presented here as an example. This paper's goal is not to make judgments or to supplement a false or incomplete representation; indeed we acknowledge that there may not be an ideal and right way of representing the Damodar or any other river. The focus is on how power relations within society become apparent through the conceptualisation of rivers or the water in rivers as a resource.

Ram Sarup, a well-known engineer of the Damodar Valley Corporation (DVC) wrote an article in 1959 entitled 'Problems of canal excavation in Damodar Valley Corporation'. The article was published in *Indian Journal of Power and River Valley Development*, at that time a premier journal on water resource development and planning. In his paper, Ram Sarup described (from his engineering perspective) how the canal construction work had progressed through mighty engineering problems posed by the local environment of the deltaic Bengal, and how expertly these problems were dealt with. He elaborated on how heavy bulldozers had been brought in to 'clean up land' since thick jungles and ponds were hindering the survey of the area. Then 'heavy pumps' were used to 'dewater' the ponds, and the ridges between the ponds were 'de-rooted' to 'avoid damages to the tyres'. The soft, deltaic, alluvial soil was hardened so that motor scrapers could be used. Since the water table was very high 'borrow pits were left for drying up for several days and machines had to fill the embankments in patches here and there adjacent to their respective borrow area'. Even so the use of machines proved difficult as tractor scrapers got stuck and 'had to be towed out with great difficulty'. Then a problem of soil shortage arose while constructing the embankments along the Damodar, and 'some more land was acquired to meet the need for soil'. The embankments created another problem in turn; they obstructed the tributaries which meet and the distributaries which take off from the Damodar. Thus, the Sali River was closed by building embankments along the course of the main river.

The description suggests that the Damodar River lived in isolation away from humans and that there were no relations whatsoever between the two. So much importance was given to canals that neither the rights of the rivers nor of the humans who lived along side them, were taken into consideration; it was as if the premise that dams and canals will be beneficial to humans had taken control of all subsequent actions. It was, if local people were no better than just minor observers of a grand design being unfolded by the state and its engineer experts. It has been said (McCormack, 1997) that 'the aspiration to control the natural flows of water in the world's rivers is as old as civilisation itself.' Ram Sarup's way must have been the right way to imagine rivers in an India aspiring to capture the benefits of western science and technology. But was it the way local communities traditionally perceived the river Damodar? What does Ram Sarup's view tell us about power relations in the society that established the Damodar Valley Corporation (DVC)?

Who owns the river?

Rivers do not exist in a vacuum though Ram Sarup's article projects this spurious viewpoint. Rivers are not separate from the rest of the society and culture, though the myth is that they are and should be. The objectification of rivers was a historical construction of urban Indian middle classes exposed to western scientific thought and was, to a great extent, forced upon

some of the rivers through the separation of local communities from their river water management rights, and on others through measures such as universal education.

Society, however, is not homogeneous, nor its people equal in terms of power distribution. Power relations envelop lives at a multitude of levels. To dominate nature is a popular goal and has long been seen as a primary concern of humans. A river, however, does not exist outside of human society: it is not just a thing out there in nature. Instead rivers interact constantly with culture so that how it is dealt with is largely determined by a tangle of relationships and narratives with which it is constantly negotiating, being affected by, or even resisting. Much of the controversy over rivers in contemporary times arises because symbols are confused with memory and memory and symbols with actual rivers. Consequently, the idea of any rivers is based on an oversimplified notion, a myth that can be seen as a result of converging historical developments in ideas, discourses, legislation, and the individual psychological processes of memory and projection. The myth is alive and believed; it says that rivers are objects that have value for humans as resources and that any discordant behaviour on their part must be curbed. Citizens have a heavy investment in perpetuating this myth because otherwise their precarious idea of having control over nature is threatened and that can shake the very roots of self and identity. Therefore, struggle is a manifested to protect the river's dependency as well as to project what some see as its correct and proper behaviour. This accords humans a great degree of power and control over rivers. Unknowingly, rivers are used as symbols, confusing them once again with real rivers and what these rivers represent to different people in different contexts.

Rivers and their floods, or how they have been socially created in post-colonial India, reveal how western concepts can be transplanted lock, stock and barrel into an altogether different context. In the context of river development this knowledge was seen as autonomous and objective; values such as reason and rationality had been constructed as good and co-terminus with development. This worldview reveals the intoxicated arrogance of humans armed with scientific knowledge and technology borrowed from their imperial rulers. What are the fundamental characteristics of this knowledge? Its universalism, its image of nature as an adversary, its assumption of replicability, and its agenda of the march of progress. In other words, the assumption is that what is applicable in the west works perfectly in India (or anywhere else for that matter) and that it raise the standards of living of the people, which is a frequently used *mantra*.

Water resource planners, as a result, did not appreciate the differences between European/American rivers and those of India, particularly the uniqueness of the natural-social contexts of the latter. South Asian rivers have significant seasonal variations in flow, they drain densely populated and intensively cultivated areas, they do not have stable courses, and above all, they bring down huge quantities of solid matter along with their water in the monsoon. The fury of the rivers during the rainy season and the resultant

fear has propagated a disaster syndrome in the science of rivers. This fear conceived floods as a deviant behaviour of the rivers – something that is not normal-interfering with the welfare of those living in the floodplains. Urban experts formed enquiry committees and called in western scientists and technocrats who eventually handed over the responsibility of policing the rivers to the indigenous state in ways chosen by the briefness. Flood mitigation thus became part of selling the fantastic dream of multipurpose river valley projects in India. This simplified myth is now facing severe criticism now that experiences with these projects in the last two decades have revealed shortcomings. The various purposes outlined in large river valley projects hangover systemic conflicts among each other: augmenting lean season flow does not go with hydropower generation, and flood control conflicts with storing water, which calls for empty reservoirs.

We need to ask ourselves carefully why we want rivers to remain innocent and docile, and what this innocence means to us. It can mean freedom from destruction, but also disempowerment for rivers and local communities. We need to consider how we benefit from each alternative. Fear of floods and safety may also relate to our own fears of losing control over what we see as a resource river water. Fear is fertile ground for tyrannical governance to flourish. Is this what we want for the future?

CONTROLLING THE DAMODAR

The Damodar is not just any other river. It has fascinating characteristics that make it unique. For example, the name tells us that it is male, indicating it is indeed one of the wilder rivers. Unlike most European rivers that do not have a specific gender many Indian rivers are either feminine or masculine, depending on their destructiveness. The Damodar is known for its destructive floods and benevolent moods, so naturally it was the first river to herald modern thinking on river training in India and the first river to be controlled in a large way. The Damodar drains an area with contrasting characteristics of land and peoples, and has an inland delta, a rather rare feature for a river (Bagchi, 1944). Its basin houses a densely populated, highly urbanised, highly industrialised and intensively cultivated area (Lahiri, 1985). It is the Damodar basin with its canals that pioneered the so-called Green Revolution. The Damodar basin supports widely diverse cultures – from traditional *adivasi* (original dwellers) cultures to modern metropolitan cosmopolitanism (Singh, 1985).

The Damodar flows through the eastern Indian states of Bihar and West Bengal, across the coal and steel belt. Its basin comprises nearly 24 thousand (23,931.24) square kilometres. The upper two-thirds of the basin is located in the Chotanagpur plateau of Bihar, and the lower one-third is in the Rarh and deltaic plains of Bengal. A number of tiny seasonal streams emerge from the Khamarpat and Birjanga hills around the region

where the districts of Ranchi, Hazaribagh and Palamou meet at an approximate elevation of 600 metres, and coalesce to form Deonad, a river sacred to the local tribals. Lower down, the Deonad is called the Damodar – the name originating from *dam + udar* (the river with a fiery belly, possibly symbolising the existence of coal in its valley) as claimed by the agricultural settled caste Hindus who belong to the upper crust of modern Indian society, or *dah + modar* (sacred water) as claimed by local *adivasi* folklore. Eventually, the 541 kilometre-long river meets the Hooghly, a distributary of the Ganga and the life-blood of Calcutta port, near Falta-Point. The Damodar divides itself into many branches before joining the Hooghly; the first to leave the Damodar is the Banka, which again splits into the Khari and Behula (Paterson, 1910).

Over the years many of these distributaries have been beheaded by local agricultural communities and have now lost connection with the parent river. Banka, for example, now originates from a rice field near Paraj village on the west of Burdwan town. So much is the hunger for land in this part of India (the density of population in the lower valley is around 1,300 persons per square kilometre, and about 34 percent of this population live below the statistical poverty line) that much of the stream's course has been stolen from the river and used as cultivated land. However, since the Banka tries to establish its own course during heavy monsoons by eroding the agricultural plots, the local *panchyat*s (elected village councils that administer government schemes in rural India) have cut narrow *nullah*s in the rice fields to let the water flow. At the lowermost end of its basin, there are many choked up tributaries all choked up at one end. This fact is denoted by their local names, such as *maja* (silted up) and *kana* (one-eyed) Damodar, etc.

The upper and lower reaches of the Damodar have contrasting ecological characteristics. The upper valley has a rugged appearance, high slopes, forest and scrub jungles, and terraced cultivated fields. The lower valley on the other hand is nearly flat, even bowl-like, building an inland delta with its numerous anastomosing distributaries which transmit the flood waters very effectively over wide areas, making it impossible to restrict the spill water to well-defined limits (Sen, 1968). The deltaic stretch has an unusual concentration of agrarian population and settlements, and land and water are the primary resources for the subsistence farmers who cultivate the swampy lands (Mukherjee, 1938).

The course of the Damodar lies parallel but opposite to the direction of many of the monsoon rainstorms, which usually track north and northwest. In this contrast lies the main cause of the recurrent floods. Monsoon rains in the hills of upper catchment area follow those in the plains but descend quickly from the uplands carrying huge amounts of silt onto the flat land. The silty waters reach the lowland only to find the lower reaches of the rivers already inflated. Moreover, because of the low gradient, the waters move very slowly. To compound the difficulty the Hooghly, into which the Damodar drains, is a tidal river which does not allow the release of water into the Bay of Bengal all 24 hours a day.

Instead, the excess water remains in the lower valley for days during August and September before being drained out into the sea (Bagchi, 1971).

The Damodar is one of many critically important rivers that have received relatively little scientific attention, but which, indirectly, affect the well-being of the people and communities who depend upon it. Its floods (especially those of 1913, 1935, 1943, 1958, 1959, 1961 and 1978) have assumed legendary proportions and accordingly a large number of myths have grown up surrounding the river and its floods. Surprisingly, the scientific community and the army of engineers manning the irrigation department of the Ministry of Water Resources, Government of India, have sustained many of these myths. They include among others the strong belief that heavy rainfall alone is responsible for the large-scale floods in the lower Damodar valley. This perception reached a final stage when after the 1943 flood Calcutta became isolated from the rest of India for over a week at the peak of the Second World War. A flood enquiry committee was set up with famous scientists and the urban elite, and decision to control the highly seasonal flow of the Damodar in multiple ways to benefit people in the valley was made. Farmers, it was agreed, would get irrigation water in winter, cities and collieries would get industrial water, hydro-power would energise the mining-urban-industrial economy, communities living in the lower valley would be saved from floods, navigation canals would facilitate the movement of people and goods from the mineral-rich upper valley to the crop-rich lower valley, pisciculture would improve the supply of protein to poor farmers plates and families would go for recreational outings in boat in the reservoirs behind the dams which led to establishment of DVC in 1948 by a special Act of the Government of India for multipurpose water resource development (Government of India, 1954).

Two key principles behind the multi-purpose river valley development in Damodar were announced:

1. Excess water during the monsoon must be stored within the upland areas in large reservoirs, and released from dams to augment the lean season flow; and
2. High embankments must be constructed along river courses to prevent monsoon flows from reaching densely populated, intensively cultivated lowlands.

Small-scale interventions in Damodar began during the colonial times with the application of imported civil engineering techniques such as the construction of the Anderson weir at Rondiha onwards from 1927, from which the Eden canal took off towards the lower agricultural fields (Basu, 1963). At one time, the river carried a flourishing trade between the Chotanagpur plateau and deltaic Bengal; village elders still talk about the large *mahajani* barges that transported resources of the plateau and the lowlands. Settlements lying along the course of the Damodar had thrived at one time as ports because of this trade,

but some of them like Kanchannagar were also famous for their indigenous manufacturing industries. The Hooghly tides reached Burdwan town, located approximately at the apex of the Damodar delta, until around the mid-fifties. The *maharaja* of Burdwan first built low embankments along the river to protect the town from floods; the southern embankment was deliberately kept weaker than its northern counterpart (Choudhury, 1990). Monsoon floods escaped through *hana*s (breaches) in these *nikashi* (drainage) areas in the south bank. The villages on the right-hand side of the river are still agriculturally rich. Here are found the homes of rich but relatively handicapped peasant families in the sense that they are not well-connected even to Burdwan town (Samanta and Lahiri-Dutt, 1996).

The DVC was set up by a newly independent nation keen to apply modern scientific knowledge and technology for the good of its millions of poor. W. L. Voorduin, an engineer of the Tennessee Valley Authority (TVA) worked on a *Technical Report on Unified Development of the Damodar Valley* (1945) and suggested that eight dams (one each on the Maithon, Konar, Tilaiya, Panchet, Aiyar, Deolbari, Bokaro and the Bermo, all upper catchment tributaries of the Damodar) could contain the excess monsoon water from the upland catchment. Each of these dams would be proposed, have its own hydro-power station in addition to a thermal power plant in Bokaro. The entire system would culminate at Durgapur barrage which is located at the beginning of the plains and which releases water into two main canal systems on the left and right bank into the lower valley. The barrage would supply water to the planned industrial town of Durgapur and to nearby colliery towns.

A large number of *adivasi* families were displaced and relocated (Ganguly-Thukral, 1992) in DVC colonies in the process of constructing these structures. Eventually only four were built due to the lack of funds and of interstate political understanding. In his famous treatise, Bhattacharyya (1986) noted the obstruction of natural drainage caused by embankments along roads and the hastening of the decay of Calcutta port due to the DVC dams. Still, these dams continued to represent all that is 'good', 'international', 'modern' and 'scientific' as opposed to 'bad', 'local', 'traditional/folk' and 'unscientific'. The DVC describes itself as a pioneer in modern river control in India (Mishra and Dutta, 1998). No wonder the then Prime Minister Jawarharlal Nehru called such enormous structures 'temples of modern India' – a secular India, an industrial India, an English-educated India of his dreams. It was the age of dams in a time of postcolonialism and nationalisation characterised by a secular faith in the dam (Sangwan, 1991). There was a paradoxical combination of the rejection of western political hegemony with the adoption, often in passionate measure, of a western faith in nature-dominating technology. The dam formed the centrepiece of that faith. At that time there was no question of requesting that the people living in a valley participate. It was taken for granted that some people would have to suffer for the greater common good which is denoted by numbers only. The specific groups that benefited from a project and those that suffered were not identified. The

transition in water resource technology in India at the cusp of independence thus reflected two dominant themes; protection of land and peoples and the regulation of the aberrant behaviour of rivers.

Now, over 50 years later, the DVC creates large floods every year, produces an insignificant amount of hydro-electricity and puts a far greater thrust on thermal power generation. It is unable to meet the growing winter water demands of lower Damodar valley farmers. The intensity of floods has increased since the construction of DVC dams; floods now stay longer and cover ever-wider areas. Large areas in the intensively cultivated lower catchment areas have been salinised, waterlogged or lost due to riverbank erosion. In addition, breached embankments pour sand on cultivated land (Chakraborty, 1979). The DVC has indirectly hastened the decay of Calcutta port, leading to the construction of Farakka Barrage, a major point of dispute between India and Bangladesh. Now a series of other dams are being proposed to check the water descending onto the Gangetic plains from the Himalaya. Thus intervention in one part of the river system has resulted in a chain of technological reactions (Bandyopadhyay, 1995; Chapman, 1995; Crow *et al.*, 1995) leading eventually to similar interventions.

Ram Sarup wrote his article 40 years ago, at a time when the environmental and ecological effects of developmental activities did not receive adequate attention anywhere in the world. It reads as though river related development were happening in a vacuum, a space created for the first time by modern science and technology, and to be shaped by these very forces. Sarup and others acted if suddenly the water flowing in the river turned into a resource, and as it any excess (or shortage) became a constraint. When the water of a river flowed into a sea, it was seen as a waste. The resource as it was viewed, was for the first time to be used in a certain way as if no one had lived on the land or used the water before. As if the river did not have a conscious past, it was treated as a figure in a landscape rather than as an image related to time and place. This was a kind of Newtonian space based on the predictable and orderly movements of objects over an undifferentiated space made visible for the first time. In this space, the river was perceived as a thing that could be modified, controlled and given a desired shape as per human wishes through the use of superior scientific knowledge and techniques. This view of rivers espouses durability, stability and continuity, and believes that modern science alone can give a consistent and systematic interpretation of all the phenomena that we see around us.

Ram Sarup's article also clearly tells us, albeit in an indirect manner, something about the ideological orientation of development in the post-colonial state as well as about the political economy of water resource planning in India. It tells us how rivers were represented in the official perspective 40 years ago when the Damodar Valley Corporation built dams and embankments in a bid to control the river. If the environment is a social construction, then that society must be put in perspective in time and place. Through the

representation of rivers in a certain way, the state also represents itself as a controller of all the elements of the natural environment and endows itself with performative power in terms of river control.

Statements like 'floods cause tremendous human suffering and economic loss' abound in government documents, then and now. When a river floods, it is viewed as a menace; and the state is supposed to assume the responsibility for remedying it. Urban-based media repeatedly present floods as disasters. Floods in eastern India and Bangladesh draw a lot of attention in the national and international media. Since they make good stories of human misery, the media plays up the disaster angle. The chain of events that follow a flood – represented it as an example of the aberrant behaviour of rivers–invariably leads to a high-level consensus on the need for some measure of river control. This is probably because the notion of the perverted behaviour of a river makes us feel uncomfortable, reminds us of our own morass of irrationality, and thus invites attempts to control such behaviour. Terms like 'harnessing' and 'taming' a river are frequently used in the now flourishing literature on water resource management. There is an inherent arrogance in using an equestrian metaphor for a river, or in trying to 'domesticate' a wild river by 'training' and 'taming' it (see for example, Shah, 1947). We imagine rivers are uncivil and hence that they need to be controlled through the creation of great structures.

The use of such terms of undiscipline and control in describing river behaviour explains why the newly independent state of India took upon itself the right to control rivers. This was done in much the same fashion as was adopted in the developed countries of the West. By imposing the structural model of river control like that developed in America on eastern Indian rivers, the state stated its belief in the applicability of universal principles and denied the uniqueness of the region's rivers. Moreover, this model deprived local communities living in riparian areas of their right to manage their own resources in time-tested ways. Above all, the technical solutions adopted to control rivers curtailed the rights of rivers to move over space, and this gave rise not only to a series of technical problems but also to immense political disputes as well. What the river and its changing moods meant to those who lived in its basin, and to those who made technology-choices for them, must, therefore, be understood as a first step. Through this understanding, we can look into the knowledge-base of the technology adopted by the state. We can understand the political, social and economic processes that led to the adoption of the technology of large dams across and embankments along river courses. What true 'objective necessities' lay behind the selection of this technology? Did it lead to a furthering of the human knowledge developed in the floodplains over hundreds of years? Or was it a product of how rivers and their floods had meanings fixed on them by the western-educated, urban elite with access to decision making power? Since rivers are the most critical natural element in deltaic Bengal, were the plurality and the heterogeneity of options considered before dealing with them in a certain way?

WATER AS A RESOURCE AND PEOPLE

The next important question is how the state performed the duty of policing the rivers. To meet this end the state set up multiple institutions and agencies for flood control, irrigation, and the rehabilitation of displaced persons in river valley projects. These steps, however, represent a fragmentary approach in dealing with a single entity like a river. When floods do happen in spite of all the technological and institutional interventions put in place to prevent them, there is inevitably an emergency response from the state. It is not surprising that there is no singular agency for dealing with the consequences of floods. This critical response one that directly influences the wellbeing and safety of human communities – is supposedly no one's responsibility. Instead conflicts of interests within the government and the ensuing sense of guilt work against the provision of flood relief. In most post-flood situations, institutional failure has been shocking (Dixit, 1999). Year after year, we witness the spectacle of the politics of flood relief but inevitably, the furore dies down within a couple of months. Floods have a human security dimension though they have almost always been viewed from a technical angle. The real victims of a flood are usually those differentiated by class; in most cases the poor are most affected by a flood. One major flood can make the poor more vulnerable, marginalise them further, may be even uproot them from their land and livelihood. The unease of the state with the technology of flood prevention that it has adopted is adequately spoken of by the lack of any well-conceived, fool-proof popular and well-publicised flood insurance programme for poor people living in marginal environments in floodprone areas.

Floods are not unusual in deltaic Bengal. The land itself has been built up over thousands of years with silt brought down by the Ganga-Brahmaputra-Meghna, and their innumerable tributaries and distributaries. The region acts as a funnel for draining out the waters of Nepal, the Gangetic plains, the Sikkim and Darjeeling ranges, and the northeastern hills of the Himalayas. The estuaries of the Bengal delta lie in an active tidal region, which hinders the release of river water during high tide. If peak discharges from the Ganga and Brahmaputra systems occur simultaneously, floods are bound to occur. Floods are thus not only unavoidable, they are an inherent feature of the ecological process of deltaic Bengal.

Rural people in Bengal had for generations lived harmoniously with the changing nature of the rivers through intricate systems of adjustment with the rising and falling rhythm. The floods used to be confined to the areas adjacent to the overflowing channels and since they occurred more or less regularly, were negotiated by local people with indigenous precautions developed through experience developed over hundreds of years. Such practices did not usurp either the rights of a river to change, or those of the communities living along side it to manage their resource. Even indigenous architecture respected the rights of rivers to spread beyond their banks during the monsoon: older

houses in many villages along the lower course of the Damodar have high plinth levels to protect them from floods.

The systems of human adjustment to floods that had developed over centuries had acknowledged and even welcomed the delivery of enormous amounts of silt mixed with the monsoon flows of rivers. Sir William Willcocks (1930) wrote in his seminal essay on 'Ancient Systems of Irrigation in Bengal' that at one time the farmers of Bengal delta welcomed the rains and the floods they brought. As the rivers used to overtop the banks, the clay-humus rich silt contained in the upper layer was deposited on the soil, increasing its fertility many times. When an embankment is breached now, the fertility of agricultural plots is destroyed for several years because of sand deposition. It is true that the floods have now become significantly less in volume and fewer in frequency, but they occur more suddenly in unpredictable areas and are of longer duration. As drainage channels have altered or have become silted up, the extent of the area flooded has also changed and erosive activity along riverbank has become more predominant. As Daniel Beard noted (1995), these problems are akin to those of nuclear power plants: 'you get immediate benefits, but also long-term costs of a very great magnitude'.

In popular psychology, especially among the city-bred, floods engender a fear factor. The urban mind is afraid of the rage of rivers. In India where wide gaps exist in almost all aspects of rural and urban economic sectors, there is also a distinct gap in perception with regard to rivers and their floods. Cities are where much of the capital of a developing society is concentrated and hence it becomes the primary task of the state to protect them. For example, it was only after the 1943 flood, when Calcutta was detached from the rest of the world, that the Damodar floods first came under serious scrutiny by the city-elite. The final report of the 'West Bengal Flood Enquiry Committee' (1959) established the need for large-scale river control. Members of a peasant family, having spent all their lives beside a flood-prone river, know that flood waters recede and when they do the land turns more productive. More than floods as such, they fear unexpected erosive attacks of rivers which rob them of their lands or sand deposition on the land when flood waters rush through breached embankments and render land permanently uncultivable (Hofer and Messerli, 1997, Elahi, 1989).

The urban elite who make decisions about technology are not the ones who bear the end results of their decisions. Since independence they viewed floods as the major problem created by rivers. Many of the conflicts of today are a result of this attitude and relate to how rivers were problematised in the first place in India (Abbas, 1982). Over the years there has been a greater emphasis by the state on building physical capital on rivers rather than social capital among the people living in the floodplains. The state has perceived the control of rivers as its own responsibility, and since it believed it possessed all the natural resources falling within its political boundaries, its ownership of rivers, too was announced through river training.

Imagining rivers as causing the menace of floods ignores one vital dimension of rivers: they are essentially channels of drainage. They are meant to drain water from a large area to the sea – they are not meant to store water. Any channel that is cut to let excess water pass through must have an easy outlet to the sea or to another water channel. The DVC canals ignore this basic fact and drain into low-lying area that remains under water for over five months a year. Lower Damodar valley is not an exception; drainage congestion has become a serious issue in several parts of the country, an issue that is rarely taken up by the state. Questions, similarly, have also arisen regarding the loss in effectiveness of large-scale canal irrigation (Dhawan, 1997).

DO PEOPLE WANT MORE DAMS?

One of the most significant of the ongoing debates in Asia, especially in South Asian nations is on water resource planning especially on the way the development agenda has been visualised so far on the chimera of affluence. Taking development as a universal goal, one has to accept that it means solving the basic needs of food, water and power and beyond that, the creation of a more intangible, but no less crucial, sense of identity, community and affluence. Techno-optimism to the point of hubris insists that grand nature-remoulding engineering schemes constitute the core of national development and disdain for the critical or dissenting views of local communities is evident in every measure taken to control rivers. We often claim to be rejecting Western values but at a fundamental level South Asian society remain enthralled by the images of power and the subjugation of nature conveyed by a quintessential modern phenomenon like the high dam. The evidence of a paradigm shift in the assessment of its worth is now clear (Singh, 1997; McCully, 1998; Iyer, 1998; Raina, 2000; WCD, 2000), but the evidence is little appreciated by politicians, bureaucrats and engineers, who continue to threaten rivers and local communities who live close to them.

What we see here is that the state's undisputed ownership of all natural resources falling within its boundaries has denied local communities their traditional rights to decide the pattern of use of their local environmental advantages. Moreover, the establishment of a Western model of economic development and the spread of this ideology through innumerable channels of communication has largely altered the perceptions of farmers. One more significant change in the region was the introduction of modern seed and fertilizer technology in the late 1960s, the resultant agro-economic changes have often unwittingly contributed to the DVC canals in spite of evidence otherwise (Rogaly *et al.*, 1999). In spite of all the control measures floods have not really disappeared altogether, instead, their nature has changed and the main *khariff* crop is often destroyed. Inundation is no longer seen as an unavoidable, natural process because ferocious floods no longer occur with regularity in the lower Damodar valley. However, when they do occur they are greater in magnitude, longer in duration, and spread over a much larger areas than they used to be.

Several grassroot level movements have grown up in recent years in the lower Damodar Valley region to address water-agriculture-flood-drought-developmental issues. Several low-investment, low-technology options are beginning to emerge through the activism of such local groups.

During the last 40 years since the publication of Ram Sarup's article, the perceptions of even the rural peasant of Bengal have changed significantly. Revitalising the culture of living with floods is extremely difficult and impractical in areas like the lower Damodar valley, where instead of one, farmers now have become used to harvesting two or three crops in a year. Consequently, there has been an attitudinal change to rivers at the village level too; replicating the intellectual dependency perfected during the colonial times originally by W.L Voorduin.

A dominant economic form has become well established, and many farmers in the DVC command area now refuse to see themselves as peripheral to the formal development process of the country. If dams-embankment-High Yielding Variety (HYV) seed-fertilizer technology is synonymous with mainstream development, then the aspiration of the farmer is quite understandably to get a piece of the pie too. Over the decades, agrarian populations have been given a particular notion of development, and now they want more of it. It is the way rivers have been perceived that has made it so difficult for people to now imagine their suppression. As a result, the rights of the river are now pitted against the rights of the agrarian classes, giving rise to a whole set of new questions that are yet to be thrashed out in developing countries like India. For example, would a local community still have traditional rights after converting to a modern lifestyle? Till what stage of entry into the market economy, will communities be considered traditional and local? In other words, how do we problematise the community itself?

Take *boro* rice for example. This water-intensive winter crop now provides the main source of cash income to farmers of lower Damodar region. *Boro* rice is entirely dependent on the supply of irrigation water through various means. As canal water is cheaper than groundwater farmers demand more of it on a regular basis. The DVC canal water in turn is neither sufficient nor reliable. However, canal water is not a singular offering; it comes in a package and that package is rather expensive. Ratan Lal Ghosh, a poor peasant of lower Damodar Valley, has only one *bigha* (one-third of an acre) of land; he supports a family of five with the income from this land. His son is getting a in college degree and he dreams of his son becoming a *babu*, a *bhadralok* (a gentleman who was not a farmer to start with). After his monsoon season crops were destroyed by floods last year, Ratan sold the last of his wife's good to buy this capital-intensive technology package for a second winter crop. When DVC failed to supply the requisite amount of water Ratan was distraught with a sense of being cheated. The entire process maps out terrain that is structural and governed by a tending towards globalisation which offers poor peasants like Ratan only a

few highly constrained options. The traditional mode of knowledge has collapsed and human agencies have become reduced to a function of economic forces in which poverty and the poor are stigmatised – all in the name of development.

CONCLUSION

In terms of imagining rivers confusion exists at several levels–the psychological, the material and the symbolic. The relationships among subjectivity, power, authority, constructions of 'truth', and the associated production of knowledge are exposed with respect to rivers.

Rivers are also something that we construct and to which we give meanings; this perspectival conception of rivers can never be overlooked. Whilst a river is a natural phenomenon, it is also a constructed category; hence, its images vary as they are constantly produced and reworked over time. The geographical image of a river removes from sight the participation of local communities in the dynamics of political and economic life. By portraying the river and its problems as a picture laid out before the mind's eye like a map, floods in the Damodar become something unnatural.

The name Damodar represented as an empirical object denotes an extent of space and population. Development literature reproduces the convention of imagining rivers as empirical objects and thus steers the minds of local communities toward paving a path toward a monolithic culture of materialism. As the water of a river is represented as an economic good, the contradictions between economic efficiency and human welfare or rights become apparent in the valuing of water.

As much as floods are a construction, so are droughts people's perceived lack of water or water scarcity at a time when it is needed. It is a fact that water is finite and its supply is limited at a given time and place. As people get used to more water-intensive cropping patterns, their demand for water goes up. As the state has ownership of rivers now, the easiest way out becomes demanding more water and more control over rivers. In this way, the development agenda denies the rights of rivers and the rights of local communities. This is relevant especially in view of recent efforts to privatise water management and treat water as an economic good. Where do communities stand vis-a-vis these changes?

The separation of the rights of local communities to use water and the rights of rivers to flow and move over space has created many conflicts over water. The deep ecology wing of environmentalists believes that elements of the natural environment may have rights that are as valid as those of humans. This is true, but is one claimaints in the power relation These argument often neglect the issue of power relations within human society and instead choose to consider it homogeneous. Our treatise here is an effort to point out the interplay of power relations in making decisions about resources, especially when rivers are concerned, and to underscore the social construction of rivers themselves.

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COUNTER NARRATIVE OF IRRIGATION MANAGEMENT: THE CASE OF PAKISTAN

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ABSTRACT

Historical trends show that irrigation management in the Indus basin region has not been simply a matter of economic benefit, but has also been connected with political as well as ecological imperatives. In order to take these imperatives into account, there is a need to find alternative solutions based on new policy linkages among rights, including historical rights, democratic governance and sustainable modes of water use. The revival of traditional water harvesting systems should be part of this new thinking and strategy.

POWER, KNOWLEDGE AND WATER MANAGEMENT

Since their very inception, the political technologies of imperialism have been deeply rooted in the historical achievements of colonial sociology and the discourse of imperial science. Science has always helped to secure and justify Western domination over people and the transformation of production to suit an expanding world economy. Imperial science is a structure of knowledge grounded in the will to integrate the diverse and heterogeneous economies of the South into an all-encompassing global process of capital accumulation. The massive investment made by Western civilisation in modern (imperial) science is because of the possibilities such science offers for control. In other words, loyalty to science has deep political underpinnings.

Science has not only been able to 'reproduce' nature, it has also reduced its diversity by eliminating it and offering more homogenous alternatives. Thus, the progressive and unilinear growth of imperial science, as well as of scientific administration, has led to the systematic extermination of historically created heterogeneous community structures and local knowledge. The result has been a restructuring of these institutions to meet the mounting pressure of global capital accumulation.

To achieve this objective, a three-pronged strategy with polymorphous techniques of subjugation was employed. The strategy first tried to create a colonial system by linking

the colonial state and the indigenous elite in a common political order. Institutional mutations were introduced to transform traditional restricted property rights into something resembling the unencumbered private property rights characteristics of the Western agricultural system. The restricted nature of the traditional property rights systems that had prevailed across the Subcontinent had been a principle bar to the expansion of commercial agriculture. Secondly, the Green Revolution was put forward as a political enterprise to defuse revolutionary political turmoil and to integrate the farm ecosystems with the world market economy. This was brought about by the creation of increased dependence on external inputs such as hybrid seeds, fertilizers, pesticides and a regular supply of water. The third and the most recent political strategy is the destruction of the nation-state system through globalisation, thereby directly linking the weak peripheries of the South – and their fragile economic systems – with the powerful Western Metropolis.

The history of irrigation and agriculture in Pakistan is a mega narrative of this historically evolved three-pronged strategy. Pakistan ranks fifth in the world and third in Asia in terms of irrigation area on account of its massive irrigation system comprising of three huge dams, 16 barrages, 12 inter-link canals, two siphons, and 43 main canals. The paper highlights and analyse the impact of the past political processes, discourses and policy choices that have played an instrumental role in reshaping Pakistan's water management system, displacing certain established historical rights and transforming some of them into new property rights regimes and even creating new conflicts over water that require new sets of rights and governance systems.

Pre-colonial agriculture and irrigation systems

Before the Industrial Revolution, a majority of the world's civilisations served as plant economies. Agriculture constituted the basis of all other human activity. Although we lack a continuous history of agriculture in the Indus basin, we do know that the region is one of the oldest agricultural areas in the lndo-Pakistan subcontinent. Practiced from about five thousand years ago, agriculture created a very elaborate civilisation in the Indus basin. Traditionally, agricultural practices were always exercised within the natural limits set by the ecology of the land.

The annual floods of the lndus and its tributaries shaped the development of agriculture. The irrigation technologies of the pre-colonial period were highly developed and ecologically sound. The following description by Walker, a British colonial official, illustrates the salient features of the irrigation system:

> The vast and numerous tanks, reservoirs, and artificial lakes as well as dams of solid masonry in rivers which they constructed for the purpose of fertilizing their fields, show the extreme attentiveness they had in order to secure this

> object. Besides the great reservoirs for water, the country is covered with numerous wells that are employed for watering the fields. The water is raised by a wheel either by men or bullocks, and is conveyed forward by little canals, which diverge on all sides, so as to convey a sufficient quantity of moisture to the roots of the most distant plants.

Unlike the massive hydraulic works of the Chinese, the pre-colonial Indus Basin Irrigation System was localised and depended on the mobilisation of communities by the local elite. Interestingly, these communities benefited directly from the irrigation work undertaken by the elite. Indus basin agriculture provides evidence that is contrary to the theory of 'oriental despotism', which claims that irrigation was a major cause of the emergence of centralised political authority and supra-community political organisation. This argument identifies the development of irrigation networks as a major cause of the development of early states. Although there was a comprehensive system of irrigation in the Indus basin, there are little evidence to suggest that it produced what may be called a 'hydraulic bureaucracy'. We cannot, therefore, infer from massive irrigation works the existence of a large labour force under central state control. Yet, the pre-colonial state doubtless played a positive role in providing a means of irrigation (canals, embanked tanks) for agriculture. The state in the subcontinent occasionally helped promote cultivation by introducing measures such as *taqavi* loans, tax remissions and by repairing *bunds* or excavating canals, but these did not constitute a very large portion of the total on-going activity; in any case the effects of these measures were marginal. The prime responsibility of the management of the irrigation system in the Indus Basin was traditionally vested in local community leaders and farmers.

An important hallmark of the pre-colonial history of the Indus Basin Agriculture and Irrigation System was the construction of inundation canals. These strongly influenced the localised pattern of agriculture by opening up areas which were away from the direct impact of river floods to regular irrigation when the rivers filled the canals in the hot spring and summer months. Through this activity, large tracts of Mianwali, Jhang, Muzaffargarh, Multan, Derajat, Hyderabad, and Thatta were brought under cultivation. Today, these constitute the oldest agricultural areas of the lndus valley. In a very short time, the inundation canal system became widespread all over the Indus basin region. For example, the geographical outreach of these inundation canals in Muzaffargarh District was about 88 miles long and eight to 26 miles broad, with a cluster of 14 estates. Besides inundation canals, wells and *jhalars* were also used to increase the extent of the irrigated area.

Pastoral and fishing communities were an integral part of pre-colonial rural society that had long-standing patterns of land use dependent on the availability of water and pasture land. The Mohana tribes, for example, are the oldest inhabitants of this region

and have dominated fishing for centuries. There was also an especially strong reciprocal relationship between pastoral and agricultural communities. During the winter when the water level in pastorlists' wells started to decline, tribes and clans moved onto the more water-rich agricultural plains. The pastoralists gained by having good pasture land, the agriculturalists by the addition of manure to their fields.

COLONIAL TRANSFORMATION: COMMUNITY TO BUREAUCRACY

The arrival of British rule caused a rapid transformation in the Indus Basin Agriculture and Irrigation Systems. British colonial rulers brought new intensive technologies as well as a new concept of state power to the region. Along with the colonial thirst for maximum revenue collection, the link between canal building, agricultural settlement, and political control was central to the building up of colonial state power.

Beginning in 1880, the British colonial administration started building a series of perennial canals. The construction of perennial canals opened up millions of acres of arid land for new settlements. As a result, millions of immigrants were brought in from eastern Punjab to develop the newly irrigated lands.

Very soon this trend of agriculture settlement became a political imperative for stabilising British authority in the Indus basin region. The British viewed their irrigation policy as being critical for gaining control over Upper Sind. Canal building was seen as a 'civilising lever to tame predatory Baluch tribes'. The colonial objective was to convert these tribes into peaceful agriculturists. The settlement of pastoral tribes, in fact, emerged as a major factor behind establishing British power in the Punjab. As one local British officer wrote about parts of the Multanbar in 1849, 'the people are herdsmen, little engaged in agriculture, and without extensive means of irrigation. To give them the means of cultivating would be a great aid to the Magistrate'. Moreover, the establishment of the institution of private property was not only intended to facilitate the collection of land tax, but it also established a new kind of social and legal contract between the colonial government and local peasants or landowners. The overall strategy was to encourage a general moral transformation that would draw the local community into the developing colonial legal structure. As Richard Temple wrote in 1850:

> Rude races first learn civilisation by becoming possessed of property. Take a wild wanderer of the *Bar*, give him some land to squat upon and call his own, and he forthwith becomes a wiser and better man.

The permanent land settlement and revenue administration resulted in the tying up of powerful local men to the colonial state. Thus, the British colonial regime created a

feudal class by offering *main* (political pensions) and *jagir (jobs)* to loyal influential village headmen. This two-pronged political system–feudalism and colonial bureaucracy–on the one hand, engendered a relatively permanent power hierarchy within the community and, on the other, centralised the political control of the bureaucracy. One aspect of this change in the structure of land ownership was the institutionalisation of money lending on a permanent basis. For example, the 1668 Punjab census listed 53,263 bankers and moneylenders in the province. By 1911, their number had increased to 193,890. Likewise, 44 per cent of the cultivated land was mortgaged to these moneylenders in 1875-76, but by 1919 the figure had risen to over 51 per cent. The influence of moneylenders eventually proved catastrophic to the agriculture of the Indus basin region.

The nature of colonial administration was radically different from that of the former Mughal system of agricultural administration. In the Mughal era, there was no rigid professional compartmentalisation, which is a chief characteristic of modern bureaucracy. Moreland remarks on the Mughal agricultural administration as follows:

> From the purely fiscal standpoint, a chief was a farmer holding (the land) for an indefinite term; and from the same standpoint, headmen engaged for a village or pargana were also technically farmers. Salaried assessors and collectors again might easily become farmers by arranging a fixed sum instead of accounting for fluctuating collections. The agrarian system presents a kaleidoscopic aspect, with chief, headmen and collectors, each assuming the appearance of the others (Moreland, 1994).

Colonial politico-technological interventions metaphorically led to the replacement of community management by a machine. As one engineer commented: 'An irrigation system, in its parts, comprises a very delicate machine. These several parts constantly require adjustment and overhauling. To deprive machines of these adjustments can only spell immediate loss of efficiency and, in a very short term, disaster.'

This development had serious political implications because it was closely associated with engineering efforts to transform the extremely sensitive political equation of the distribution of water – an arena within which notions of local 'community' had long played critical roles. This development required a new but alien set of rights and governance structure, thereby displacing the historical rights of communities and their local system of management.

GREEN REVOLUTION: A THIRST FOR WATER

Since the demise of colonialism, the Green Revolution has been a major instrument for speeding up the process of dependent development that was initially triggered by colonial

domination. The underlying assumption embedded in the Green Revolution philosophy was that it was being applied in a context of economic scarcity and a general lack of basic resources. Thus, the Green Revolution was perceived as a techno-political strategy that would eliminate rural poverty and lessen the threat of a potential peasant uprising. The objective of the Green Revolution was not only to engender the process of technological innovation but also to engineer socio-political relations. Thus, science (technology) and politics were wedded together from the very inception of the Green Revolution. The British-American sponsored Colombo Plan of 1952 was an explicit articulation of this techno-political strategy. The World Bank and its other allied multilateral financial institutions were instructed to redesign their lending policies to achieve the objectives of this plan. As a result, agricultural lending associated with the Green Revolution grew from 18.5 per cent of annual loan commitments in 1968 to 31 per cent in 1981.

Contrary to the often – euphoric vision surrounding the Green Revolution, totally opposite conditions prevailed when its impact was felt. The invisible ecological, social, and political violence of the Green Revolution became visible very soon. World Bank lending for agriculture actually promoted the destruction of smaller local eco-farms and thus displaced hundreds of millions of peasants around the world. Beneath all the uplifting rhetoric, the Green Revolution strategy in practice only accelerated the process of agricultural modernisation and integration into the global market despite increased inequality. Moreover, the Bank consistently applied a standardised system, disregarding the heterogeneity of local ecological and institutional considerations.

Furthermore, due to the Green Revolution's bias against small-farmers, the agriculture sector was redesigned to focus narrowly on a few commodity crops. As a result, crops produced by small peasants were neglected. In addition, the new technology required the use of relatively fertile land for its successful implementation. Therefore, the Revolution aggravated already inequitable patterns of power and resource relationships. In fact, the Green Revolution became a substitute for land reforms in view of increasing food production.

The political implication of this shift was increased financial control by agro-chemical and seed corporations and greater control over natural resources and biodiversity by international agricultural research institutions. The introductions of HYVs was accompanied by intensive external inputs such as chemical fertilizers and pesticides to protect the new seed varieties, which were more vulnerable to disease and pest attacks than traditional varieties. However, excessive applications of chemical fertilizers resulted in the deterioration of soil structure. Similarly, although the use of pesticides was previously quite low in Pakistan in 1950, only four per cent of farms in the country used pesticides, by 1985, usage had increased by almost 350 per cent. All these factors increased not only the profit of multinational corporations but also the control of the First World over the genetic resources of the Third World.

Moreover, the miracle seeds of the Green Revolution created a new demand for the intensive use of water. They needed an abundant and timely supply of irrigation water. In fact, the Green Revolution was based on the expansion and intensification of irrigation by surface as well as groundwater. Green Revolution varieties need much more water than indigenous varieties. For example, HYVs of wheat need about three times as much irrigation water as traditional varieties. Overall, the Green Revolution increased the need for irrigation water on two levels. First, the shift from water–prudent local crops to monoculture and multicropping increased the demand for water inputs. Secondly, the replacement of the old varieties of wheat, rice, etc., also increased the intensity of irrigation, which went up from 20-30 per cent to 200-300 per cent. Increased water demand led to the construction of new reservoirs. During the 1960s, Pakistan explored its multipurpose hydro options with encouragement from donors, multilateral banks and investors who were willing to help provide large capital investments. The result was Mangla Dam (1967), Tarbela Dam (1975) and other barrages.

In retrospect, the Green Revolution caused a total destabilisation of the water balance in the Indus basin region. Adding more water to an ecosystem than the natural drainage potential of that system has destabilised the water cycle and led to desertification through waterlogging and salinity. Desertification of this kind is a result of water abuse rather than water use. This is associated with large irrigation projects and water intensive cultivation patterns. The Punjab and Sind provinces now suffer more than other Indian province from such forms of land degradation. According to a careful estimate, approximately 104 MAF of water are diverted at the canal head, but only 43 MM are delivered to the farms. One-quarter of the total water diverted between the canal head and the watercourse head is lost. Another 34 per cent disappears within the watercourses. A further 11.5 per cent is lost in farmers' fields. Thus, only 30 per cent of the total diverted water supplies actually reach the farm area. These water losses contribute largely to the problem of waterlogging. The impact of waterlogging is not just confined to the effects of water upon crop growth it also influences salinity levels. According to an estimate of the Water and Power Development Authority, 25 per cent of the land suffers from surface salinity, while 39 per cent is affected by 'profile salinity'. It might be argued that water seepage encourages the addition of salts and, when pumped back, results in the deterioration of even fresh canal and river water.

LARGE DAMS, CENTRALISATION OF POLITICAL POWER AND WATER CONFLICTS

Intensive irrigation as well as the construction of large dams has engendered a process of continuous ecological destability, on the one hand, and a chain of inter-provincial, inter-communal political conflicts, on the other. Large dams are not ecologically sustainable.

Besides causing waterlogging and salinity, the load of sedimentation in such dams is very acute. Perhaps the most vivid consequence of these mega hydro and irrigation projects is the large-scale dislocation of the poor sections of the rural population. Displacement causes severe trauma. It is like the uprooting of a tree or bush which cannot flourish if it is transplanted two or three times. The spatial distribution of human beings and social groups is not accidental; it represents a dynamic functional interrelationship in which units are historically organised in view of principles of social organisation. Hence, the aftermath of displacement entails the virtual dismantling of the vital production systems of the community, the elimination of kinship groups and family ties, the disorganisation of the informal sector and the disruption of trade and market links among other things.

Although no comprehensive data regarding the displacement caused by these megahydro and irrigation projects is available in Pakistan, even the scant information that has been gathered is very depressing. For example, Tarbela dam displaced over 100,000 people. Today, the inhabitants of the same area are experiencing a repeat of the Tarbela episode due to the construction of the Ghazi-Barotha Hydro Power Project (GBHP).

Aside from ecological destabilisation, megahydro and intensive irrigation projects have also led to inter-provincial water conflicts. Soon after partition in 1947, a conflict arose between India and Pakistan over the sharing of the Indus River's water resources. The conflict over this water sharing was resolved with the help of the World Bank in the form of the Indus Water Treaty. While the lndus water conflict between India and Pakistan was resolved, the inter-provincial conflict has continued to be intractable despite the existence of countless water agreements. The dispute over the construction of Kalabagh dam is an example. It is clear that such megahydro and irrigation projects are sure to aggravate inter-provincial and inter-communal political conflicts.

In view of the above stated arguments it is clear that the Green Revolution, with its high demand for intensive irrigation, increased the centralised political control of the state and subsequently engendered troublesome water conflicts.

CONCLUSION

Irrigation management in the Indus basin region historically has not simply been a matter of extracting economic revenue, but also been connected with political and ecological imperatives. Alternative policy that recognise linkages between rights, including historical rights, democratic governance and sustainable modes of water use, can lead to irrigation management that takes cognisance of the political and ecological imperatives. The colonial development project overshadowed the array of water management techniques practiced in South Asia. The rise of the western ways of developing water occured at the cost of degradation of ecology and social fabric of local community. By rehabilitating traditional water harvesting systems the balance can begin to be restored.

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LIFE WITHIN THE KOSI EMBANKMENTS

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ABSTRACT

In 1954 governments of Nepal and India signed the Kosi agreement paving way for the implementation of the Kosi embankments to control its floods. Known for its vagaries the river had shifted its course for about 115 kilometres in past 200 years. Though the embankments were meant to provide security from flooding, today large tracks of land, higher than that expected to be made secure from flooding by the embankment, lie waterlogged in Kosi dependent region of north Bihar. This paper documents lessons of implementing a large-scale structural approach i.e. embankment, in a densely populated alluvial landscape. The implementation of the embankments was fraught with human miseries that remained unheeded as technical hubris intermixed with the imperatives of project implementations. More than 200,000 people live within the Kosi embankments and cope with the consequences of the interventions expected to provide them security from annual flooding. Conventional policy science to flood control remains insulated from the consequences of its interventions, while the hapless communities have become despondent.

INTRODUCTION

On March, 20 1959, Rasik Lal Yadav while speaking in the Bihar Vidhan Sabha on the Bihar Appropriation Bill 1959, raised a very pertinent issue regarding the Kosi Project. He said, 'the situation with the Revenue Department is such that its officers chase people around, extracting revenue from them even while their houses are submerged under water. They chase even those who grow only cucumbers to meet ends meet. Those who live outside the embankments are told to cultivate within the embankments, but when they go inside, the boatmen managing the *ghats* plague them with ferrying costs. The Kosi Project was designed and implemented to protect the people and not to hassle them'.[1] Forty-two years have passed since Yadav made that speech, but the situation in the Kosi basin in Bihar has changed very little.

The Kosi and the Kosi project

The Kosi is a turbulent Himalayan river in North Bihar. It originates in the hills of Tibet and Nepal and has a catchment area of about 59,000 km^2 at Tribeni where three of its

major tributaries, the Arun, the Sun Kosi and the Tamur join to give it the name the Sapta Kosi. The river debouches onto the plains at Chatara in Nepal, flows south to join the Ganga near Kursela in Bihar's Katihar District. In the plains the river's length is 307 km, of which 254 km is in Bihar. Natural and tectonic processes contribute large amount of sediment load to the Kosi River system and due to the heavy sediment load the river shows capricious behaviour in the plains as it emerges from Chatara. During the period 1736 to 1964 CE the river shifted 110 km westward. The topographical changes brought about by the earthquake of 1936 also exacerbated flood problems in the river. Its changing course has been a challenge to engineers, who aim to confine the river to a single channel with the objective of controlling floods.

The construction of the embankments along the banks of Kosi started after the agreement on Kosi River was made with Nepal. The embankments were meant to protect an area of 212,000 hectares of land in Bihar from the vagaries of flooding which caused widespread hardships to the people of the region. Construction of the embankments began in January 1955 and ended in 1959. While the embankment aimed at providing security from floods, an unintended consequence emerged when the construction began. The project also included provisions to develop canal systems for irrigating 547,000 hectares of land in India and Nepal. At Kataiya in Bihar, a canal drop hydropower station was built.

About 304 villages along the banks of the Kosi would remain within the two embankments. According to 1951 census, these villages had a population of about 192,000. As construction proceeded the length of the proposed embankments was extended, and as a result the number of villages that would be within the embankment increased to 338. The alignment of the embankments was changed many times and authentic data on the numbers of people actually trapped within the embankments is not available. Unofficial sources claim that today about 800,000 people live within the Kosi embankments.

The British experiment with flooding rivers

In the middle of the 19th century the British engineers attempted to tame the Damodar River, known as the 'sorrow of Bengal'. They constructed embankments on the two banks of the river. However, after embanking the bed, levels in the river began to rise while the levees constrained drainage of tributaries flowing into the river. The land began to get waterlogged. The other consequence of disruption of the natural drainage in the area was incidence of widespread malaria. The embanking did not yielded the desired results. Fifteen years after building them the British were compelled to demolish the embankments. Stung by the poor performance of the embankments along the Damodar the British desisted from building embankments in other rivers of India. Using advantage of hindsight, it could be argued that had the experiment in Damodar succeeded, the British would have embanked the Kosi.

In 1941, Anugrah Narain Singh proposed that the people living along the Kosi region be relocated on the hilly areas of Ramgarh in Hazaribagh District. This proposal created a major debates and people likely to be relocated opposed it, consequently the proposal was shelved.[2] The events between 1941 and 1953, created the stimulus leading to the construction of the Kosi embankments.[3] Bharat Sevak Samaj (BBS), a voluntary organisation, was created through the good offices of top leaders of the country to undertake earthwork activities to build the embankments and canals. A formal decision to that effect was taken in 1954. Lalit Narayan Mishra and Lahtan Choudhary, two upcoming leaders of the period, were put in charge of construction of the western and the eastern embankments respectively.

Tremendous enthusiasm

The decision to build the embankment generated tremendous enthusiasm amongst those who were likely to be protected from the floods of the Kosi. The project received publicity at the national level and encouraged people from all walks of life and from all over the country to contribute to its development. People from all over India came to the region at their own cost and worked as volunteers. Students, policemen, and *sadhus* participated. Even prisoners were given special leave and offered *sharmdan*. Women from aristocratic families from Darbhanga and Muzaffarpur also participated in building the embankments. So overwhelming was the enthusiasm that the project authorities had to issue notices asking people not to come to the project site because accommodation could be provided for only about 10,000 volunteers. Almost all the national level leaders of the country including Dr Rajendra Prasad, Gulzarilal Nanda, Jay Prakash Narayan, Acharya Kripalani, Dada Dharmadhikari, and A. K. Gopalan had visited Kosi project during its construction time. Volunteers from other countries also participated. BSS motivated the societies of ex-servicemen and soldiers to join hands with the public toward constructing the western Kosi embankment near Hanuman Nagar.[4]

Politics takes the central stage

When the proposal to build the embankments was approved the people likely to be trapped within the embankments became concerned that floodwaters, which used to spread over the countryside, would exclusively become their share. The concern became a political issue. To alley fears, on 2 December, 1954, Lalit Narayan Mishra, spoke at a meeting of the BBS at Patna. He cited hydraulic model tests being undertaken at the Hydraulic Research Laboratory of the Central Board of Irrigation and Power at Poona. He suggested that the model test had shown only 10 centimetres deep water would enter the villages within the embankments. This depth was likely only when the Kosi discharged a high flood of 25,510 m^3/s. In any case, he assured the audience that this would not be a problem because people would be provided with rehabilitation support.[5]

Model tests showed that there would practically be no rise in the water levels in adjacent villages after the embankments were constructed and confirmed his views.[6] In the years to come, this conclusion has turned out to be a cruel joke on the people living within the embankments. Whether Mishra motivated Poona Laboratory to validate his statement or the Poona Laboratory suggested that he make such a statement about the extent of inundation is difficult to judge. Tul Mohan Ram, a former member of the Lok Sabha, said 'The embankment was a political embankment right from the beginning. Findings of the Poona Laboratory were misreported. The spacing between the embankments at Ghoghardiha is 16 kilometres. At Sarauni, many kilometres south, the spacing is only nine kilometres, where as it should have been more. The western embankment reached up to Aasi near Biraul in Darbhanga District, while the eastern embankment was supposed to have passed through Bangaon in Saharsa. That is how they were initially spaced. Lot of politics went in to fixing the alignment of the embankments. All the villages that were located inside the embankments wanted to be on the outside because they feared that the Kosi would devastate them during the floods. Then a deal was struck. Politicians said, 'give us votes and we will place you out of the embankments'. The leaders also played caste games. Brahmins who lived in the villages of Aasi, Kanhai and Gandaul were located outside the embankments. Today their villages are completely waterlogged though immediately after the construction their villages were free from floods.'[7] While the political debate continued, the issue of rehabilitation of the people likely to be affected by the Kosi Project was suppressed. The issues were not allowed to be raised till the foundation of the project was laid on 14 January, 1955.

Nobody wants to live within the development din of the embankments

While a high degree of enthusiasm prevailed, the farmers whose lands had been acquired temporarily for various construction purposes ran from pillar to post to get some compensation for the land and crops they had lost. There were others who lost land because alignment of the embankment passed through their land. They shuttled among various offices for compensation, but without success. The government assured them that compensation would be paid by 15 March, 1955 but there was a considerable delay. Later the date for paying compensation was put off by a month. Jai Prakash Narayan the *sarvodaya* leader, resented the delay and suggested that the farmers be paid immediately.[8]

The alignment of the embankment caused lots of heart burning among those who were directly affected. But its construction from Kunauli to Nirmali proceeded without resistance. Problems emerged beyond Nirmali. Towards the end of 1955 a movement of sorts started on the western embankment near Madhepur (now Madhubani District). The original alignment of the western embankment was designed to pass through Mataras, Madhepur and Jhamta, but the local people wanted it to be aligned through Mataras,

Karahara and Jhamta. They argued that their proposal was shorter and would be less costly to build. The realignment, they argued, meant that fewer numbers of villages would be located on the riverside of the embankment. And, lastly, they reminded the administration of the assurances that Dr Rajendra Prasad gave in 1954: the government would try to save every village as possible.

People are kicked around and the embankment alignments start

There were sit-in strikes, processions and protest marches along the western embankment because the alignment below Mataras had been changed. The situation became tense and volatile in January and February 1956. The protesters mounted pressure on the administration to stick to the original drawings. A delegation of protesters armed with necessary papers met the administrator and the Chief Engineer of the Kosi Project at Patna on 24 January, 1956. In this meeting the protesters were told that the entire flow of the Kosi River would pass between the two embankments. Many protesters had hitherto believed that the river water would be distributed through many channels and would spread over a large area. One of the delegates told the administrator that if the river water was not dispersed at the barrage site and was instead allowed to flow only within the embankments flooding situation near the western embankment would worsen and villagers would be drowned. The land between the embankments, they pointed out was not flat; it sloped downwards towards the western embankment. As a result, the floodwaters would submerge land along the western embankment and only the overflow would spill towards the eastern embankment. The officials had no logical explanation to this observation of the villagers, but they did have a smart answer: what was being done was on the advice of experts and their opinion reigned supreme.[9]

The government clarified its position through a press release. It read: attempts were made to shift the alignment of the embankment towards the east to the greatest extent possible, even so, two densely populated villages, Mataras and Tardiha could not be brought outside the embankments. At the request of some petitioners, the state government asked the administrator of the Kosi Project to have the alignment reviewed. He inspected the site and reiterated that no change was possible. If the embankment alignment is pushed further east, it will get very close to the live channels of the Kosi and embankment's survival well be at stake.'[10]

Lalit Narayan Mishra urged the people to calm down. He encouraged them through BSS to sacrifice in the name of nation building. Said he; 'people of the Kosi belt, like any other place, are always ready to spill blood for every inch of land. The farmers of the area refused to give their lands in the beginning and threatened bloodshed if it were taken forcibly. But workers of BSS kept convincing them that the embankment would benefit a large number of other people. The villagers of Jhitki and Bangama understood the

significance of the embankments and they set an example by donating their land. This left a good impression on other villages, who also gifted their houses and even their orchards'.[11]

Mishra did not, however, speak the whole truth. The residents of Jhitki Village that he referred to had a different story. Says Bhogendra Jha (72) of that village, '... This is ridiculous. Someone who deprives you of your land will have you part with it happily? Jogeshwar Jha, who later became a Member of Parliament, led a movement opposing the alignment. We wanted his village to remain outside the embankment. He asked, 'did not Lalit Narayan Mishra, the administrator of the Kosi Project, T. P. Singh and chief engineer of the project, K. V. Ekambaram come to our village and tell us, in very plain words, that we would gain if we remained within the embankments?' They did not elaborate on the gains but said that they had come to explain things to us and if we launched a movement, the government was well equipped to deal with it suitably.... We held a meeting of all the village elders and sought a lawyer's advice. The lawyer told us that if the government wanted to acquire the village land, it would do so and that it was impossible to stop the government. He advised us to part with our land in the interest of the country... after we were ensured that we would be paid proper compensation, we parted with the land, even in the village itself. We did not go to collect payment. The alignment of the embankment was an issue everywhere and we participated in the process. Surprisingly, water never came to our village, not even during the floods of 1968 and 1987.'[12]

Ekambaram suggested that to determine how Mataras and Tardiha could be saved from the onslaughts of the Kosi, the problem be referred to the Central Water and Power Commission. If a thorough investigation is not made, he claimed, the benefits might be converted into losses. Instead of being extended to Nawada, the embankment should be terminated in a tank in Madhepur. It was, however, decided that the embankment would be extended to Jhamta. The topography of the land below Madhepur would be studied in greater detail and every effort made to publish maps within two to three months, he said. After consulting the collector of Darbhanga, a project for further protection should be designed. He suggested that people of the area faced increased flood hazards due to the westward shift of the Kosi for the past few years and that the threat exist even if the embankment is constructed. Hence proper arrangements should be made to face the situation.[13]

For the potential flood victims, rehabilitation was a long-term issue, but those villagers who happened to be located within the alignment of the embankments faced an immediate battle for survival. On 12 September, 1956 a delegation led by Ram Sevak Thakur met T. P. Singh and Hari Nath Mishra. The delegation suggested that the western embankment should connect Rajuahi and Karahara. Because it would save the villages of Mataras, Kishan Pur, Kamchhua, Kalua, Tradiha, Bochahi, Ajrakabe, Bhawar, Kasaha, Siparaha, Asma, Sikaria, Agargarha, Kusaul, Mahisam, Janardan Pur, Bhaluahi, Maruna, Nawada, Tengra, Kurso,

Bhumpur, Sarauni, Rupouli, and Chunni. Spread over an area of 31,000 acres, the combined population of these villages was 32,000.[14]

Tardiha remained outside of the embankment while Matras is situated inside. The people of Matras have interesting memories of the time when the embankment was being constructed. Says Indra Kant Jha (71) of Tradiha, '.... We were located only 30 metres away from the river when the embankment was aligned below Kisuni Patti. We knew that when the river touched its bank in the rainy season, the floodwaters would enter Tradiha because the western embankment would not allow it to spread. This meant that we were face-to-face with possible wrath of the Kosi and even death. We approached the project authorities to discuss the situation but nobody responded. At that stage we decided that we must do something ourselves. We chased away the labourers and threatened the contractors with dire consequences. Whenever we saw the engineers, we raised 'go back' placards. Only then did they come to negotiate with us. The negotiators included K. L. Rao, Kanwar Sain, K. V. Ekambaram, P. R. Guha and Lalit Narayan Mishra. We later met the chief minister and the finance minister at Patna at the insistence of Lalit Narayan Mishra and had the alignment altered. We were now outside the embankment, but we had to put in a lot of effort so that our village would remain outside. Remember, any person on the verge of death will do everything to save himself and we did precisely that'.[15]

The village of Matras, however, was lucky, says Narayan Rai (66) of Matras. 'Originally the embankment was to be aligned from Belhi to Jhamta through Hatni and Dhabghat. Belhi is located east of Ghoghardiha and west of Nirmali. In 1945, river water had entered our village and the embankment reached us only in 1956. It became clear that our village would fall within the embankments. We had bowed before many officers and leaders but nothing happened, so decided to do something on our own. We removed all the pegs and flags that the engineers had installed to mark the embankments alignment. As we had expected, we were promptly seized by the project authorities. We met Lalit Narayan Mishra, who persuaded us not to oppose the alignment and instead offered us some contracts in the project work.'

'We met the chief minister and demanded that the alignment be changed or, at least, a ring bund built around Matras. He agreed to our proposal and instructed in writing that the suggestion be carried out. K. L. Rao came and suggested that our village should be located outside the embankment. Subsequently, P. R. Guha, came and told us that the embankment would be built but he would for certain, do something for the village. Guha even promised that the government would import yellow soil from outside and spread it on our land to make it fit for cultivating tobacco. Selling tobacco would fetch money and improve our lot. However, we were not convinced. We protested, and built our huts on the embankment itself to warn the government that if our village was outside the embankment, we would live on the embankment itself. Immediately this information reached the division. The angry

executive engineer came with his team in a jeep and began demolishing our huts. On their part the people also turned violent, hit his jeep with sticks and chased him away. The incidence annoyed him so much that he threatened to see to it that nothing would be done for the village. Later we found out that the first thing he did upon reaching his office was to tear up drawings related to Matras. That was the end of our dealings with the Kosi Project. No one helped us, but nature did. The river has gone far away from us.'[16]

The alignment of the embankment had become a headache for the engineers of the project. Residents of every village demanded to be located outside the embankment and, thus, be secured from the onslaught of the river. The initial proposal of the embankment was aligned to pass through Madhepur. Subsequently, the proposed alignment was shifted eastward. At that stage, inhabitants of four villages, including those of Kurso protested arguing that if the alignment were shifted further east, the villages would be located within. Thus, a proposal for a straight alignment between Rajuahi and Jhamta emerged which eliminated the bunds around Sikaria and Tardiha. At the stage, the people of Mataras started demanding that the embankment be aligned to pass east of Tardiha. They suggested that if the alignment was pushed further east, Mataras would be close to the mouth of Majhari Dhar near Nirmali and the embankment could be started from Rasuar near Nirmali Ring Bund and then aligned to Karahara via Aloula, Hatni, Amahi, and Banarjhoola. If this was done, ring bunds around Tardiha, Mataras and Sikaria would not be needed. This adjustment would also automatically protect the Kurso group of villages. Every person made his/her own suggestion and pressed for its implementation.

Laksmi Narayan Lal Das of Bhaluahi village on the western Kosi embankment near Madhepur says: 'The first alignment was made from Mataras to Rahua Sangram via Bath and Tardiha. Because our house would be within the embankment, my father, along with many others, contacted Lalit Narayan Mishra for alteration of the alignment. Some top officials of the Kosi Project were coming to the Kosi Dak Bungalow for a meeting of the Kosi Control Board and Misharji suggested that our delegation meet the officials and relate the problems. We presented our case, along with maps. Project engineers, however, opposed changes though Kanwar Sain suggested otherwise. The executive engineer did not consider our suggestion kindly. Consequently, our houses would be within the embankments. We contested the design in the High Court and won the case. We presented our case again to Anugrah Narayan Singh, who was of the opinion that so much money had already been invested in the changed alignment that any more tampering with it would add unnecessarily to the cost. He was convinced only after a lot of persuasion.'[17]

Villages along eastern embankment also want to remain outside

When the alignment of the western embankment of the Kosi was pushed towards the east, people on the eastern side of the river were increasingly concerned about the altered

condition of the waterway. If the width of the waterway was reduced in that region then all the flow would be diverted towards the eastern embankment. If the villages located close to the riverside of the western embankment could successfully stall its construction, change its alignment and manage to be located out of the embankments, why could not they do the same along the eastern embankment? The residents of Dharahara Thana in Saharsa District demanded that the eastern embankment be pushed two kilometres westward downstream of Barahi and that arrangements be made to protect Barahara, Partaha and Govindpur. This idea spread soon to Mahishi and Bangaon of the district. The residents of the villages started agitating to be located outside the eastern embankment and ultimately succeeded.

By this time the western embankment was aligned to run between Belaha and Bheja east of Pouni, Sikaria and Tardiha. From Tardiha the embankment was to be extended to Jamalpur of Darbhanga District. This alignment would keep many villages outside the embankment and provide them with security from floods. The *thanas* of Biroul and Singhia were now located outside the embankment and rejoiced at their success at having the alignment changed. Mataras, however, was still within the embankment.

Those trapped inside the embankments want a larger waterway

The embankments however squeezed those left within from both sides. The villagers were utterly disgusted with the proceedings and discontent started simmering. Towards the end of 1956, they started organising themselves against what they perceived as the injustice meted out to them. They demanded compensation for the losses that they incurred during the rains, an arrangement for shelter during the rainy season and as much widening of the distance between the two embankments as possible. They argued that if the distance between the embankments were increased more waterways would be available, the floodwaters would spread over a larger area and the impact reduced. They felt that the government was hell-bent on keeping them in darkness for all time to come and they resolved to resort to *satyagraha* if their demands were not met. People were so disillusioned that they even attempted to cut the western Kosi embankment at Aloula. Good sense prevailed, however, and they decided to give the government another chance to decide things afresh.

The government's threat to deploy armed police to quell dissent

Because of the widespread resentment among the people regarding the construction of the embankments, work was suspended in most places. Since the general election of 1957 were approaching, the government could not deploy an armed police force to the area on the scale necessary to ensure that the construction of the embankments proceeded as planned. The work on the western Kosi embankment remained suspended till after the elections were held. A meeting of representatives from 87 villages under the leadership

of Jaidev Salhaita was held at Kusamaul just before the general elections, on 4 February, 1957. It was resolved in the meeting that the government should be pressed to follow the embankment alignment passing through Madhepur. The people felt that in order to save 14 villages, the interests of the 79 villages, trapped within the embankments had been sacrificed. The villagers decided to fight. They claimed that about 20 lakh rupees had already been spent on the Madhepur alignment works and that it would not be wise to waste this money. They feared that by reducing the distance between the embankments, the villages located within would simply be swept away by the river waters. They had informed the concerned officials of the project about their apprehensions and sat on *dharna* from 6 February, 1957.[18]

After the government deployed armed police to the work sites, the engineers took a more tougher line. Additional Chief Engineer P. R. Guha, stated that no more changes in the alignment of the Kosi embankments would be entertained. Thirty-six villages were issued a notice under Article 107 of the Indian Constitution to that effect. The unit leaders of BSS, who had gone on a retreat, returned but did not resume work because they feared violence and wanted police protection.[19]

The IG-Police had already promised the chief engineer that police protection would be available soon. Deputy Chief Administrator Sachin Dutta spent five days in the disputed villages convincing people to allow the embankments to be built. His efforts did not yield the desired results. The agitators from Karahara to Bheja and from Bheja to Jamalpur and Bhanthi, were vigilant all along the length of the embankment: they uprooted the pegs and flags put in place by project engineers, and in many places, chased them away. Similar events took place in the Dharahara *thana* on the eastern embankment. A spokesperson of the government told media persons on 8 March that the government could stop work by complete as it was and warned the people that if they faced floods the government would not come to their rescue.[20]

The threat becomes a reality: police mount an attack

After the elections the new government was sworn in. The new government dispatched armed police to the embankment construction sites. Work on the western embankment resumed but the resistance did not subside. In the regions between Chunni and Tekunatol, Bheja and Tarahi, and Tarahi and Jamalpur people's resistance was fierce. Project officials faced steep resistance at Karahara, Dwalakh, Tengaraha, Bariyarawa, Darah, Kharik, Bhakharain, Rahua, Sangram, Musaharia and Baghawa. The project had, however, successfully split the people in two groups: those who wanted spacing between the embankment to increase and those who wanted it to decrease. The two groups fought on the streets near Karhara, says Tara Kant Jha (76), 'the construction of the embankment reached our village in 1956. It was to pass through Madhepur. We thought that although

we would be located inside the embankments, we would sacrifice in the larger interest of the society. But when they changed the alignment and placed the embankment over our heads we realised that the government and the society around us were not bothered about our wellbeing. We wondered how long we could continue one-sided love. People opposed the alignment from Madhepur to Rahua. T. P. Singh, Ekambaram, P. R. Guha and Sachin Dutta visited the villages almost daily to convince the people that they let the embankment be built. We were opposed to it and one day we cut the embankment, and fixed our flag in it and sat there in passive resistance. This act seemed to infuriate the people on the other side who raided our villages armed with sticks. We were also prepared. We had soaked our hands in buckets full of red colour to distinguish us from them when we fought. We had been friends and relatives earlier but the proposal to build embankment had turned us into enemies. About 87 villages south of Matras were on our side. The collector of Darbhanga, Jacob, came to our village with T. P. Singh, P. R. Guha and other engineers. We refused to give in, so Jacob instructed engineers to adopt corrective measures and sent us a list of promises that he claimed would be fulfilled in 7-8 days. But just one day before his letter was delivered, Superintendent of police at Darbhanga arrested us on charges of cutting the embankment. Many of us spent a fortnight in Darbhanga jail before we could get a bail. Upon our release, local officers told us that we should not continue to resist and that, instead, we should accept whatever the government gave us. We demanded that a ring bund be build around our village which was granted. The floods of 1966 washed around the ring bund and the story ended there.'[21]

Along almost the entire length of the western embankment the government gave written notices to the villagers that they should not obstruct official work. But BSS volunteers were still chased away by the agitators. The offices of BSS and the huts of the labourers were set on fire. Villagers intimidated labourers and assaulted officials too. The situation at Agargarha *dhar* was tense and uneasy calm prevailed between Jhagarua and Nima. To bring the situation under control hundreds of agitators were put behind bars. The government feared that the movement would spread to other places and at potential problem points provided additional police force. The situation did not change and even children and women joined the protests. Saying that the embankment could be built only over their dead bodies they used to lie down in the trenches. No amount of persuasion by senior officials convinced them to stop interfering with the construction work. Contractors vacated the sites and the Additional Chief Engineer pleaded with agitation to let them resume work, but the agitators did not respond.

Lakshaman Rai (72) of Musaharia, Thana Jamalpur, District Darbhanga, had this to say: 'The work on the embankment remained suspended for over a year and resumed only after March 1957. The situation was tense. The embankment was originally aligned to pass through Tardiha, Pali, Ghanshyam Pur and Biroul and end in Tilkeshwar. The

villagers were honest and influential. They were also attached to the BSS in Aasi and Kanhai. They had the alignment changed so that their villages would be located outside the embankments. We demanded that either the embankment be made according to the original design or else it should be reduced in such a manner that Tarahi and Musaharia would be located outside. Altogether some 300 persons, including women were arrested for defying prohibitory orders, though the women were not sent to jail. The collector of Darbhanga, Jacob, camped in Jamalpur Middle School when the police resorted to blank fire to scare people. We were taken to Darbhanga jail, where Jacob came to meet us and gave us assurances. Binoda Nand Jha was the Panchayat Minister and it was through his good offices that we got bail. We all knew Lalit Narayan Mishra, who had once camped in Jamalpur Middle School for six months and who later became a minister in Delhi. An agreement that we would all be rehabilitated was signed with him in the house of Keshav Narayan Khan. Bahadur Khan Sharma insisted on total rehabilitation 'on as is where is' basis. Lalit Babu agreed. He also promised a college in Jamalpur and services from Jhanjharpur, a job for every family and so on. None of the promises were remained fulfilled. I have a certificate for serving a jail term of four months. 'So what? They said to me.'[22]

Baidya Nath Mehta and many others including Parmeshwar Kunwar, Tul Mohan Ram, Yuvraj, Janak Singh and Janki Nandan Singh raised the issue in Bihar Vidhan Sabha. Mehta charged the government, 'when you go there, you will find the Kosi roaring like a lion and destroying land and people alike. When people ask you, what is our future? What is your perspective about the things that you are doing?.... What is the government doing for us? ... then you throw them behind bars.'[23]

Flexible alignment and servile technology

The setting was, thus, complete. On one side were people who wanted the western Kosi embankment shifted eastward, on the other were people who wanted the eastern Kosi embankment pushed westwards. If both these demands had been met, very little space would have been left between the two embankments for the floodwaters to pass through. Those living between did not want the embankments constructed, in the first place. If preventing the construction was not possible, they wanted the space in between increased to the greatest extent possible. This demand could only be achieved if the earlier two demands were rejected. As if this were not enough, there was a set of people who were not interested in the alignment of embankments. They wanted the embankments to be built so that they could get employment. This number was quite significant. The government used these people as a propaganda tool to emphasise that demand for the embankments was indeed very high. Thus each group had its own interest in the project and dashed with others. That the people continued fighting among themselves and did not reach any consensus was in the interest of the government. This would give the government the

space to do whatever it wanted in the name of technical propriety though such notions had been thrown to winds long ago. In all fairness, engineers should have decided the height, width and spacing of the embankments, but measurements were decided on the basis of what looked like an opinion poll. The Kosi embankments remain a caricature of the original or any subsequently designed alignment.

Long term rehabilitation

Rehabilitation was a non-issue in the project. Voices about the need to rehabilitate people were heard only after the construction of the embankment had started. Those likely to be trapped within the embankments were encouraged to sacrifice their lands for the larger good of the society and for nation building. T. P. Singh reported, 'fair compensation would be paid for land likely to be trapped within the embankments as soon as possible. People will not have to pursue payment. The embankments will not bifurcate any village, no house will be destroyed because of the embankments. Should any house be demolished, an immediate solution to the problem will be found and staff scarcity will not come in the way.'[24] Mahi Narayan Jha, Public Relations Officer of the project said, 'although no decision has yet been made regarding the situation of those living within the embankments, the results of the experiments from the Poona Laboratory show that embankments will not cause much inconvenience, which are encouraging.'[25]

Because chaos prevailed over the alignment of the embankments, there was confusion about who should be compensated and who should not. The villagers of Hati and Barahi, who were located within the embankments on the eastern side of the river pleaded with BSS to change the alignment of the embankment in such a way that the villages would be located outside the embankments. The local administration assured the villagers that their requests would be looked into.[26] The issues of compensation, rehabilitation and the well-being of those living within embankments remained unaddressed and nobody knew what was going to happen to the people who became the hapless victims of the project. On 2 March 1956, the Kosi Control Board met in Patna to discuss the issues of compensation and rehabilitation. It was reported that the members of the Central Water and Power Commission were opposed to paying any compensation to the embankment victims as this would set the wrong precedent. But Ram Charittar Singh, then Irrigation Minister in Bihar, and T. P. Singh prevailed upon these views. The chief minister also supported the views of Singh.[27]

Lalit Narayan Mishra demanded rehabilitation

There was a public meeting of BSS workers at Ghoghardiha on 11 June, 1956. The meeting reached this resolution: 'This conference invites the attention of the Government of India and the Government of Bihar towards the sad plight of the people trapped between the

river and the embankments. The villages of Charier, Loukahi, Dhanchhoa, Bagewa, Aloula, Hatni, Nidhma, Shatrupatti, Saharawa, Naua Bakhar (Phul Paras Thana) along the eastern embankment and of Bishunpur, Tardiha, Sikaria, Mahisam and Mataras along the western Kosi embankment are greatly distressed. The villages located within two or three kilometres of the embankment will face the wrath of the river. These villages will be the first to get submerged and their crops will be lost. Their future is bleak and there is no hope that they will ever get a respite from the floods of the Kosi.'[28]

The meeting also demanded that wherever possible, the villages should be protected by ring bunds, flood victims should be resettled, proper arrangements for employing victims made, and certificates issued to such persons waiving the payment of land revenue and the recovery of loans. Lalit Narayan Mishra who had said earlier, on 2 December, 1954, that the problem of rehabilitation was not very serious proposed the resolution which was seconded by Rasik Lal Yadav. People kept on demanding rehabilitation and officials kept on harping about details that would come from the laboratory in Poona. That the findings of the Poona Laboratory had become an object of ridicule during the floods of 1956 did not occur to any of the officials. T. P. Singh told media persons on 11 June, 1956, that a vast tract of Saharsa District was safe from floods because an embankment had been built. An area that once resembled an ocean had been turned into smiling lush green fields. He maintained that it was not possible to protect the people living within the embankments from floods and that arrangements were being made to shift them to safer places.[29]

Where is the much promised relief?

T. P. Singh's views about the situation in the Kosi belt were officially nurtured but the reality within the embankments was entirely different. In the Bihar Vidhan Sabha Janaki Nandan Singh narrated the story of the suffering. He said, '... the pathetic condition of the people that I have seen in those places will make anybody cry. They do not have a dry piece of land even for answering nature's call. There are no crops and people are face-to-face with death. Relief could probably have saved them from this disaster but it has been suspended for several days... You claim to be a welfare state but thousands of people are facing starvation... It is a pity that you say that there is no money. What is the government for?'[30]

Agitation for rehabilitation

People's dissent simmered slowly as they began to understand the impact of embankments. A movement was launched under the leadership of Bhushan Gupta, Chairman of Saharsa District Board in the middle of 1956. He took up the cause of the people whose houses and lands had been trapped within the embankments because it was certain by then that they would face the devastating currents of the river after it was embanked. '...Gupta maintained that the people had been given assurances by the leaders that they would get

a house for a house and land for land if they faced danger or destruction. The term 'leader' itself was confusing. In those days, even those leaders who had no authority made speeches. Those who had authority did not mean what they said because they must have known that their assurances had no meaning. Assurances to rehabilitate had glumness of truth because when promises were made there was no intention to implement them. And anyone who said nothing untoward would happen to be falsifying the reality.'[31]

The promise that 'nothing untoward will happen' raises many crucial questions. Did the leaders not know that when the Kosi was being embanked all its water that passed through its various channels would flow within the embankments? Did they not know that the flood problem, which the entire Kosi belt face would become exclusively the share of the unfortunate victims within the embankments? Did the experts not learn from the experience of the Hwang Ho River in China? Did they not know that the Chinese people were sick of the embankments on their rivers and they wanted taming of the river using different means? Did the engineers at the Poona Hydraulics Laboratory not know that the land within the embankments sloped towards the west and that the river water did not follow the law of averages and that it would not flow in a sheet of 10 centimetres deep? Did the leaders of BBS, who had the mandate to 'break and shake mountains', not know that people would have to be shifted from their villages?

They did know. According to Braj Nandan Azad, 'at the earlier stages these issues were not allowed to be pressed because the cost of the project would increase and could be used to question the project itself. That fear is over. It should now be possible for the authorities concerned to plan evacuation'.[32] His views were reinforced by M. M. Prasad, who wrote, 'Bihar is entitled to ask if the Bihar Government realises even now that they, as well as the Union Government, have been less than fair. Both have in fact, been callous towards the fate and fortune of a population... in exact figures 1.91 lakhs; 45,291 houses, of which 2,528 are pucca and a cultivated area of 46,331 hectares half of which produce paddy. It is admitted by the chief of the Central Water, Power and Irrigation Commission that even a flood of two lakh cusec (5,670 cumec) would overtop the banks. It may so happen and in the absence of relief generally available from the spread of flood water, the consequent inundation may endanger both life and property creating an intolerable situation...If the people concerned are to be left to the tender mercies of demonstrations in the Poona Institute, their future can be well imagined.'[33] Prasad, a member of the state assembly also raised other concerns. He said, 'I would invite the attention of the Irrigation Minister to the problem of the Kosi that confronts a population of 1.5 lakh and that cannot be solved in the research laboratory at Poona. The Kosi is a meandering river and the excessive discharge of water causes great difficulty for the people. Sir, the sooner the problem is tackled; the better it will be for the people and the government. In spite of the efforts that you have made the problem remains unchanged.'[34]

In a letter to the editor, Aryavarta, Lahtan Choudhary, Kamta Prasad Gupta, Bhola Sardar and Khub Lal Mahato wrote, '...lakhs of people trapped between the two embankments of the Kosi curse their fate and suffer from a fear complex. The government, instead of alleviating the suffering of the people, has added fuel to the fire. The concerned officials never bothered to inform the people that a danger looms large over them and that they should be prepared to shift any moment. The people have left fallow most of their land, on which they could have grown some crops. ... the relief distribution has been stopped. Many villages located outside the embankments have become pools and their plight has become even worse.'[35] The accredited leaders of these times could not guess the impact of the embankments. As leaders they actually should have been aware of the uncertainty, at the very least.

Lahatan Choudhary demands rehabilitation

Some sympathy was shown to the victims of the embankments. Referring to the views of the agitators, Lahatan Choudhary, suggested that,[36]

1. The government should immediately announce that it will assume responsibility for the well-being of the people likely to be trapped within the embankments.
2. Survey parties, in good numbers, should be sent to assess the details of the houses and agricultural fields of every family so that they are properly compensated for in their time of need. This task should be completed before June because after that the floods will hamper work. In addition, position of the land also changes after the floods.
3. The villages likely to be affected by floods should be relocated before the rains and their people be informed about this decision.
4. Those who do not want to move or those in the government feels need not move, should get waivers on government loans, land revenue and other taxes. Proper arrangements for providing them with relief should be ensured and a separate officer appointed to avoid delays.

Government agrees to a deflated rehabilitation package

In July 1957 flood water was everywhere, both inside and outside the embankments. It was inside the embankments because that was the route the flowing river could take. It was outside the embankments because the tributaries could not empty their waters into the main river. The politicians and the planners neither had the eyes nor common sense to foresee the coming events. Moreover, they deliberately kept people in the dark. Many times they took refuge in the technical study being done at Poona Laboratory. Scientific credence was used to give false assurances though the politicians were under oath to serve

the people. Others should have been guided by the ethics of their professions. The former had an excuse that they did not understand engineering and technical matters to exclusively proceed along what engineers advised. The latter hid behind the embankments, arguing that they were needed for providing immediate relief to the people who could not wait 15 long years for the Barahacchetra dam to be constructed.

People mounted pressure on the government for relocation but no land was available for rehabilitation. It was not anticipated that people would be so organised in years to come that they would remind their leaders of their obligations to them. The government realised that if the total value of all the assets had been accounted for the government would have to pay something to the tune of Rs 100 to 115 million. This amount would have disproportionately increased in the cost of the project. Hence, a rehabilitation package of just Rs 21.2 million was sanctioned, arguing that it was proportional to the cost of the project.[37]

In reply to a question from Parmeshwar Kunwar, the then Chief Minister of Bihar suggested, 'It will not be correct to say that all the villages located within the embankments will be swept away. Some villages may face this problem. It is also not possible that all the land located within the embankments will be rendered unfit for cultivation. It is quite likely that while some lands may become infertile, the fertility of some other lands may improve.... It cannot be said with certainty that all the people residing within the embankments will have to move outside, but it is a fact that the people residing in those areas fear that such a situation may arise. The state government has approved a scheme for the permanent rehabilitation of the people in the concerned area.'[38]

Dip Narayan Singh, replying on behalf of the government in the Bihar Vidhan Sabha, on 3 December 1958, assured the House that the government would provide for,

1. an equivalent area of homestead land at a reasonable distance from the embankments on the outside so that the villagers might live as close as possible to their cultivable land within the embankments.
2. additional land for community services like schools, roads etc.
3. water supply in the rehabilitation sites with the help of tanks, tubewells and wells.
4. housing grants for building houses.
5. boats to be used as means of transport to and from the agricultural lands on the inside of the embankment.

Payment schedule defined

Debesh Mookerjea wrote that the scheme of permanent rehabilitation would include,[39]

'....House building grants equivalent to the full value of the house left on the river side, without making any deduction on account of those houses which will be left with the

displaced persons. It has been decided to pay the house building grants in installments as indicated below:

1. For a value of Rs 200 and less, the payment shall be made in two equal installment:
2. For a value between Rs 200 to 5,000 in three installments;
3. For a value above Rs 5,000 in four installment.

The first installment was to be paid as soon as the plot of land acquired by the government had been allotted. The scale of expenditure on the construction of houses, out of the total amount received compensating for the value of the existing houses has for the present, been fixed as follows:

i. 75 per cent must be spent of an amount valued and Rs 1,000.
ii. 60 per cent for amounts between Rs 1,000 and 5,000.
iii. 50 per cent for amounts between Rs 5,000 and 5,000.
iv. 33 per cent for amounts between Rs 10,000 and 15,000.
v. 25 per cent for valuation above Rs 15,000.

According to Mookerjea, 'The state government has, however, undertaken a livelihood cause and compilation of data for small-scale and cottage industries in order to plan suitable schemes for the economic uplift of the rehabilitated population.'[40]

Crawling performance of rehabilitation schemes

The promises that politicians and officials made notwithstanding, the actual work of rehabilitation on the ground was rather in a very poor shape. Baidya Nath Mehta made a fervent appeal to the government. He said, '...When you can arrange for the people who have come from Pakistan, why can you not rehabilitate these people who are suffering mainly due to your own doing. They have cooperated with you and not only have they cooperated, they have also contributed to build embankments though they knew that they would suffer in future because of the embankment.... You reach them only when the elections are due, make tall promises and ask for their vote. You promise that you will waive the rent, will solve the land problem and build a house for a house. Once the elections are over, you set yourself into the reverse gear.'[41]

Some 6,650 families lived outside the embankments by 1970. This meant that about 35,000 families still lived inside the embankments. The government faced difficulties in land acquisition while the people had their own set of problems. The rehabilitation sites were far away from fields and commuting was a major problem because one had to cross various channels of the Kosi. Politicians had promised that boats would be provided but

they were not made available. The major problem with rehabilitation, it was argued was that people were attached to the lands of their ancestors and were unwilling to stay away.

Parmeshwar Kunwar, however, blasted this argument. Referring to his own village, Tarahi, Block Mahishi, District Saharsa, located with the embankments, he said, 'The rehabilitation problem is not yet sorted out there. They have been left at the mercy of God. They are told to settle down four to five miles in the west, in Darbhanga District, where they do not want to go.... Today officials tell people to go to the minister and when they contact the minister, he redirects them to the officials. About 1,200 *bighas* of land has been acquired for resettlement and people are willing to go there. But people are not permitted to use this patch of land. People are in trouble and the government says that the people are too attached to their ancestral land'.[42] Lastly, the lands on which rehabilitation sites were provided slowly got waterlogged and became unfit for living.

According to Public Accounts Committee of Bihar Vidhan Sabha, between 1958 and 1962, about 12,084 families were allotted homestead land outside the embankments and Rs 16.73 lakhs granted to them as the first installment. When there was no progress in the work, project authorities decided that they would persuade people to shift to new locations. If people did not agree to move the committee recommended that recovery proceedings be initiated against them.[43]

Another committee of Bihar Vidhan Sabha saw the problem from a different angle. The committee said that the people, whose interests had been totally sacrificed in building the embankments on the Kosi, spent a nomadic life for four to five months a year. '... It is a pathetic situation. Every year thousands of people are appointed to the project and the contractors swindle lakhs of rupees. But the affected people get neither jobs nor any preference in the awarding of contracts. They are ignored. Their number is negligible in work charge appointments let alone the permanent jobs in the project. The situation of permanent jobs in the project should not be taken lightly because it could become serious any time, resulting in law and order problems. The rehabilitation scheme in progress is totally inadequate. The farmers and the labourers are given only homestead land. They are not given any land for their livelihood. No industry is being opened in the area. All people receive is about 4 decimals of land and a small grant to build thatched houses for themselves. Most of this money is spent on collecting the grant.' According to this report, till 1972-73, Rs 1,75,28,392 of the total allocation of Rs 2,12,67,390 had been spent on rehabilitation. At that point 32,540 families had been given grants, of which only 10,580 had been given the second installment. Nobody had qualified for the third and final installment since none of the houses were complete. A major constraint to building houses was that the rehabilitation was looked after by the Rehabilitation Department while measurements were carried out by the Kosi Project. People had to run after officials in two places many times.[44]

Back home

Not much has changed since Rasik Lal Yadav charged the government with mismanaging the Kosi except that most people who were given sites for rehabilitation outside the embankments have returned to their old villages within the embankments. The first reason for their return was that they did not want to walk daily to their fields from the sites where they had been rehabilitated. As the distance between the embankments was about 10 kilometres, they had to walk long distances everyday and agriculture became unmanageable. Secondly, the rehabilitation sites subsequently became waterlogged because tributaries were blocked by embankments. Thirdly, people were emotionally attached to the ancestral lands. Because people returned to old villages, the rehabilitation files were closed since the government felt that the people were not interested in rehabilitation and preferred to live closer to their lands.

Says Ram Sagar of Belwara in Simri Bakhtiyarpur Block of Saharsa District, '....We were provided housing sites in Belwara Punarwas. Ninety-per cent people have come back to their original villages because of waterlogging in the rehabilitation sites. The government has since annually allocated this land to those who will do some farming. It does not belong to us any more. The original village is exposed to the onslaught of floods and erosion. Our village has been flooded 14 times in the past 42 years and each time we have to build a new house. There is no option left to us because our agricultural land is located inside the embankments. We move onto the eastern embankment during the floods and return after the floods subside.'[45]

Thus, the people live closer to their fields but further away from basic civic amenities, because they remain trapped within the two embankments. The block, sub-division and district collector's offices are located outside the embankments. Education, health services, legal aid, administrative requirements, banks, employment opportunities and so on exists only outside the embankments. 'The Kosi used to flow in 16 known channels prior to embanking and to minimise misery the river was jacketed. But now the problems once spread over a large area. Boatmen must be paid (Rs 17) to go to the block headquarters at Mahishi and an equal amount is needed to come back. Those who live outside the embankments do not have to pay this money, at least. It is not possible to return on the same day and one must be prepared to spend a night out' says Bindeshwari Paswan of Pachbhinda of Mahishi block in Saharsa District.[46]

Kedar Mishra of Mahishi laments, 'The Kosi belt now like a mini Chambal. One dare not go to the area within the embankments or to the region west of the western embankment. We were promised that we would be compensated with land for land, a house for a house, a link road to the embankment and free boats. Where are these promises? Nobody knows where the people from Devan Ban or Bhakua have gone. There is nothing that has not been provided to Kosi Pirit Vikas Pradhikar but where is Kosi Pirit Vikas

Pradhikar and what does it do? Will somebody tell us its address? The villagers of Lilja were resettled in Jalle, where one answers only after crossing five streams. A single boat trip costs Rs 25. People naturally prefer to go back to their villages. The literacy rate within the embankments is less than 10 per cent and the medical facilities there are non-existent. That is the rehabilitation we have got.'[47]

Kosi pirit vikas pradhikar

While most people returned to their villages, the ghost of rehabilitation continues to haunt the area. T. P. Singh, while talking in a meeting organised by Kosi Samiti, on 15 December 1954, said that the government was well aware of its obligations towards those who would live between the proposed embankments and thereby face flood hazards. It would neither dilute the demands made for compensation nor shirk its responsibilities towards the people.[48] Something similar was said by Bindeshwari Dubey, the then Chief Minister of Bihar, at Ghoghardiha, on 8 November, 1986.[49] This lack of concern of the successive governments over a span of 32 years appears ironical.

In January 1981, the state government appointed a committee to look into possibilities of the economic rehabilitation of the victims of embankments under the chairmanship of Chandra Kishore Pathak, Chairman of the Saharsa District Board. The committee submitted its report in February 1982. It remained under the active consideration of the government till January 1987, when it finally seemed to accept the report's recommendations. Bindeshwari Dubey might have considered accepting the report when he said that the government would do something for the victims. The government started Kosi Pirit Vikas Pradhikar (Kosi Sufferers Development Authority) on 14 April, 1987, and appointed a 19-member committee under the chairmanship of Lahtan Choudhary to look into the affairs of the Pradhikar. Dubey, in a message in the introductory booklet about the Pradhikar said, '...Lakhs of people have suffered untold miseries since the construction of the Kosi embankments. There could hardly be a place in any part of the country where so many people are exposed to the currents of the river. Chased by their misfortunes, these people had lost all hope... The government is determined to bring overall development to these sufferers and an authority has been constituted. It aims to bring happiness to these people once again.'[50] This is the sum total of development 32 years after works on the project began.

The Pradhikar is defunct. But it never helped the people. Rehabilitation has become a political issue. In every election, politicians promise that if they are voted into power they will revive the Pradhikar. People say that unless the Pradhikar is revived, their fate is sealed. The Pradhikar, however, was never active and hence the question of its revival is moot.

Says Ram Prasad Roshan of Telwa village in Mahishi Block of Saharsa District, '....We were given sites in Jalle to rehabilitate, which was four kilometres west of the western

embankment. My village was 1.5 kilometre inside the embankment. The Kosi embankment terminated at Ghonghepur and the backwaters of the Kosi used to reach Jalle. We demanded protection from the waters of the Kosi and the project constructed a T-spur to prevent the back-flow of the river. The spur did the job but it also prevented the Balan waters from emptying into the Kosi. Thus we were saved from the Kosi embankment 49.5 km away with all our families and cattle. This embankment breached in 1968 and we were forced to move back to our original village. Nobody lives in Jalle now. There were 10 hectares of rehabilitation land in Jalle and 35 hectares in Saharawa, where people from Chora, Jhakhara, Jhara, Karahara, Sugaroul, Lachhminia, and Majarahi had settled. They have gone all back to their respective villages.... We live in a primitive condition, which must be seen to be believed. Kosi Pirit Vikas Pradhikar was started for us and I do not know what it does. All were tall promises.'[51]

The people affected by the project were denied relief, sometimes, by the district administration of Saharsa on whimsical plea that they live where they are not supposed to. The administration argued that it could have provided them with relief, if the people had lived in the rehabilitation sites. That so many people live within the Kosi embankments and the floodwaters of the Kosi, which used to spread over a large area pass exclusively through their villages on an annual basis, is a forgotten concern. Even the designated rehabilitation sites are waterlogged. No political party or non governmental organization ever raises the fundamental questions as they seem to be downed in the fatigue of flood and rehabilitation.

Ram Chandra Khan of Musaharia village *Thana* Jamalpur, Darbhanga, laments '....We have lost all our rivers, fields, agriculture, flora and fauna, habitat, temples and mosques, and culture because of these embankments. Water remains here for eight months and floods enter our villages before the land is dry after the last flood. What sort of science or engineering is this? The Kosi used to flow in its various channels, the flood levels were low, and we had our traditional variety of paddy that used to grow in this area. The waters of the Kosi and the Kamla used to mix with each other to make the land very fertile.... Floods used to disappear with the beat of the drums of Durga Puja. All that is lost and the only solution to our problem is to return our rivers to us lock stock and barrel and in their pristine glory. I do not want to demolish the embankment or settle for the Barahkshetra dam. I want my rivers back.'[52]

The situation is summed up by Dina Nath Patel of Kabira Dhap, Block Salkhua, Saharsa District as follows. '...You ask me what I will ask if god appears before me. Don't you see that my village is getting washed away right before our eyes? And do you think god ever came to us. He did so many times. Anybody who comes here poses like a god, but he systematically cheats us and disappears. You may also be one. The best we can do is to tell the god to prove his credentials first.'[53]

Says, Parameshwar Kunwar (78) of village Tarahi, '...You cannot fight a determined state, which has all the powers to crush a movement. I am now an old man and don't have any energy left…but still feel that the embankment should be demolished in the dry season and let the Kosi go to Purnea if it so wishes. The river will do so some time on its own in the future, anyway.'[54]

CONCLUSION

The above narrative underscores the plight of the people who lived and continued to live within the Kosi embankments. In the name of development, thousands of people were not rehabilitated and need injustice meted out to them. People who live outside of north Bihar can wonder if so many people continued to suffer for such a long time why then they do not raise voices against the injustice? The fact is that the people have reconciled themselves to their fate. They have lost the will to assert themselves. Instead of putting up a fight, they migrate to Delhi, Punjab, Haryana, Gujarat and Maharastra. But there is a flip side to this question and that is, if the people suffered to such an extent, what was the government doing? Successive governments have never considered rehabilitation seriously. Today they have closed those files. Almost all the nation's political parties have now ruled the state and the country and no one party can point accusing finger at the others. Non governmental organisations distribute relief and advocate that flood disaster be managed. The injustice wrought on an unsuspecting people by technological hubris was largely forgotten in the march toward modern development. Similar situation, exits not only in plains of the Kosi River but also along the embankments of the Mahananda, the Kamla, the Gandak, the Bagmati, and the Burhi Gandak rivers in North Bihar.

In the mean time, within embankments and waterlogged regions, hapless people wait for some Messiah to emerge and rescue them. The tragedy is that there is none.

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DEVELOPMENT IMPLICATIONS OF ARSENIC IN DRINKING WATER IN BANGLADESH

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ABSTRACT

In Bangladesh the contamination of groundwater sources of drinking water with arsenic can be attributed to be the failure of the development approach in the water sector. Water agencies were unable to ensure the quality of drinking water, and the resulting arsenic contamination threatens the health of almost 85 million people. Arsenic levels in tubewells remained untested for decades and one out of 10 Bangladeshis may face a cancer-related death in the next 10 years. This outcome can be attributed to the indifference of aid-driven development approaches to local realities. Traditional ways of collecting water have been displaced by modern ways with negative effects. The arsenic problem raises questions not only about a particular technological device for extracting groundwater but also about the larger governance regime making decisions. By making international aid transparent and accountable at local and global levels, such problems can be avoided.

THE ROAD TO HELL IS PAVED WITH GOOD INTENTIONS...

In 1998, I worked with a team which was studying drinking water problems in rural Bangladesh. During that study, we walked into the village of Shapania in the southern district of Barishal with no idea of the horror that awaited us. Forty shallow tubewells provide drinking water to the 280 households. Our study showed that the water from all 40 wells were contaminated with arsenic. We visited Sikdar Bari, whose extended family of 27 members has been reduced to 11 in the last few years. A local doctor concluded from the symptoms and conditions of the surviving family members that all 11 were likely to have died from arsenic poisoning. The surviving members of the Sikdar family exhibit signs of arsenicosis.

While talking to Rashid Sikdar, we asked for water to drink. He walked to a nearby tubewell and came back with a glass of water. As I lifted the glass to drink I stopped short. The water had a repugnant fungal smell. Sikdar quietly commented, 'You cannot drink it, can you? This is what they gave us in exchange for the arsenic contaminated tubewell water that we drank for years'. Their first well was contaminated by arsenic and it had

been sealed. The second well, a deeper one installed by the Public Health Engineering Department (DPHE), had a fungal smell. We learned that the village had no other source of safe drinking water because all its tubewells were contaminated. We were shocked by what we encountered.

Sikdar's son Jahangir was diagnosed with acidity and told to drink plenty of water. Since the only source of drinking water was tubewell water, he drank gallons of arsenic contaminated water. During our study we witnessed the tragic death of young Jahangir, who succumbed to the poison in November 1999. His only sister Parul, another victim of the scourge, was forced to go back to her father's home because her in-laws would not assume the financial burden of her medical treatment. Sikdar's brother also died soon after. We felt as if we were watching the slow extinction of a family.

Young Moina, who comes from the village of Sonargaon outside Dhaka, had dark patches on what was once a beautiful face. She asked us, 'All the gold in the world cannot make me pretty again, can it? Can you tell me who did this to us?' The story of Moina is one of several similar cases. Some of the women we met spoke of menstrual problems. Men confided in us of growing weakness and impotency, yet they continued to drink the contaminated water because there was no alternative. Women with arsenicosis experienced great distress because their husbands abandoned them and their children; ill and alone, they could not cope with the burden of raising their families.

Samata in Jessore District, Southwest Bangladesh, is now a ghost village. There were 279 tubewells of which 265 were tested for arsenic contamination. Only five tubewells tested be to safe. In the initial stages of contamination no one understood why the villager's skin and eyes were stranger why their faces and legs were swollen, and why they had problems with their lungs and stomachs. The girls and boys from this village were shunned; no one wanted to marry them. Children with marks on their bodies were isolated socially because no one wanted to sit next to them in schools. The story in all affected villages is similar.

The social life of people in many rural communities has been disrupted. Treating patients affected by arsenic has become a burden for the people of rural Bangladesh, who are already impoverished. The poorest are the hardest hit because they are malnourished and have low levels of resistance. Malnutrition, some studies suggest, plays a role in increasing an individual's susceptibility to arsenic and his further deterioration of health. The cycle is broken only death or if safe water and nutrition is made available.

Arsenic reduces a person's normal productivity, slowing down his/her economic activity and capacity. The result is decreasing income and greater poverty. It is not known exactly how many people are affected by arsenic contamination though, according to Dhaka Community Hospital, there are at least 12,000 known patients. This number could be only the tip of the iceberg! People living in villages who are forced to drink poisoned water feel helpless. We wondered who would be held responsible for this state of affairs. Many

questions haunted us. With careful inquest we discovered that it all began 30 years ago and that it began with good intentions….

...BUT LITTLE GOOD SENSE

In the 1970's the lack of access to safe water was recognised as one of the main reasons for the poor health of the people of Bangladesh. Surface water was the main source of drinking water then, and cholera and diarrhoea were rampant. Since groundwater free from pathogen and bacteria was considered to be a safe source, governments and donors began to sink hand pumps all over the country in order to make groundwater available for both drinking and agricultural purposes. An aggressive and successful campaign to create demand for tubewells was also launched especially by UNICEF/DPHE. The programme for improving access was supported by major national and international agencies involved in the sector. The country had achieved, by the early 90s, 97 per cent coverage in access to drinking water through the sinking of approximately 11 million tubewells by the public and private sectors.[7] It was a moment of great achievements for the donor-driven development project.

During the same period a high yielding variety of rice was introduced so the country could achieve self sufficiency in food. The need for timely and reliable irrigation led to the large-scale development of shallow irrigation tubewells. In 200 – 23,536 deep tubewells (DTW) and 707,574 mechanically operated shallow tubewells (STW) and 67,878 manually operated STW were in operation (BADC). In a study of three Upozila in three southwestern districts JICA estimated that 99 per cent of the groundwater withdrawn is used for irrigation and only one per cent for drinking and cooking.

Some success story took a dramatic turn for the worse. In 1993 the Government of Bangladesh first acknowledged that the groundwater in the country was contaminated with arsenic but people continued drinking the water unknowingly until 1995, when Dhaka Community Hospital and some media persons made the impending disaster known. Slowly, as more and more victims of arsenic poisoning were recognised, a nightmare began to unfold. It was discovered that more than 50 million people were drinking arsenic poisoned water and more than 85 million were at risk. One of the poorest nations in the world was faced with the worst development failures in the world.

The response to the crisis by both the government and donors has been slow and inadequate. Some donors, like UNICEF and DANIDA, continue to provide funding for the development of tubewells whose objective is the mitigation of contamination by arsenic. According to Gourishankar Ghosh, Chief Water and Sanitation Division, UNICEF. '…Amidst their enthusiasm to drill tubewells in Bangladesh in the 1970's, UNICEF forgot about the Taiwan experience. The deadly water went untested for two decades'.

Not only UNICEF, but other major donors like DANIDA, DFID, and the World Bank and with government departments such as DPHE neglected to adequately test the quality of the water they promoted. In view of the fact that no developed nation in the world provides drinking water to its people without regular monitoring, it is difficult to understand or justify why the drinking water programme in Bangladesh, endorsed by experts from all over the world, did not set drinking water standards with net acceptable norms laid out in WHO guidelines.

It might be argued that, water quality was not tested since Bangladesh did not have the means or technical ability to develop or monitor its water resource. However, thus poverty-stricken country sought international financial and technical aid to develop its water. That 30 years ago people knew little about groundwater contamination, especially by arsenic, is a poor excuse for an international development enterprise not implementing a protocol for testing drinking water. Was gross negligence or merely ignorance this oversight by the international community?

In recent times, the pattern of inaction has not changed. There is evidence that both government and international agencies were aware of the arsenic crisis in 1993 but kept quiet, many programmes did not even register the fact that arsenic contamination was a reality. Threat let alone take action to ameliorate the situation. Even after nine years, little action has been taken. A key WHO official has acknowledged, 'I cannot understand how and why the WHO and UNICEF made this mistake. Anybody familiar with the map of the region should have realised that the problem has implications for Bangladesh. Initiatives should have been taken to monitor sources of drinking water immediately.' Delayed response only confirms that national and international agencies were unprepared, slow and indecisive. Moreover, they were unsure of what a water quality monitoring system acceptable to all entailed in terms of logistics and technicalities.

While commenting on the arsenic contamination of water, Herb Klein, a former US Congressman said, 'much is already clear and it is deeply embarrassing for western scientists and engineers, for this crisis is entirely due to their failures.' In the *Guardian*, Fred Pierce described arsenic contamination as one of the biggest outbreaks of poisoning in the century and claimed that blame would rest with donors agencies. The problem is not so much the fact that groundwater was contaminated but that it was not monitored. The water quality guidelines for drinking water issued by WHO include arsenic as one of the 17 parameters that must be tested, but in Bangladesh testing water quality received low priority. If groundwater was not tested, on what basis did agencies assume that it was safe? The decision to use untested water raises an ethical question: is there not a double standard one for the rich and one for the poor? Scientists and experts cannot justify the consistent lapse in testing throughout the implementation of all water sector programmes in Bangladesh.

Despite the enormity of the problem, those responsible are reluctant to acknowledge lapses. The presence of arsenic in concentrations higher than is permissible in drinking water brings to the fore questions about the basis of development as we understand it today. According to a major international water-providing agency, 'access to safe water is the means, the measure and the aim of development in Bangladesh'. Given the scale of the arsenic-affected drinking water situation, where does Bangladesh stand today? The answer to this question is simple. If the above indicator is used, Bangladesh is at zero. Immediately after independence, the majority of the country's population had no access to safe drinking water and Bangladesh was an underdeveloped country. Today, millions of dollars of investment later, the drinking water sources that the majority of Bangladeshis use are contaminated by arsenic. Despite all the good intentions of the international community and the national government, poverty-stricken and disease-prone Bangladesh remains same as it was 30 years ago. Perhaps we need to coin a new definition of development.

HALF HEARTED EFFORTS AND MISSED OPPORTUNITIES

During the International Decade for Drinking Water and Sanitation (IDDWS), financial resources were mobilised to implement a wide range of programmes design to improve people's access to safe drinking water. The resources came through internal revenue mobilisation as well as from international donors. One of the feature of the efforts of the decade was exclusive reliance on hardware to bring about solutions. Groundwater was identified as the readily available safe source and tubewells were promoted to obtain safer water and overcome the high incidence of cholera and diarrhoea. The process however, was a missed opportunity on two counts. First, water quality was not monitored. Secondly, reliable and traceable data could have been generated, but that did not happen either.

During the same period, as the Green Revolution progressed, groundwater became a reliable source for irrigating high yielding varieties of rice, yet no effort was made to put in place a mechanism for the systematic monitoring of water quality within the ambit of various water-related projects in Bangladesh. There were many openings to monitor and analyse water quality but none was pursued. Evidence shows that major water projects and surveys lacked such mechanisms. The following are examples of such oversights.

Case 1: Under the World Bank funded IDA 4000 DTW Project II, Bangladesh implemented a multi-million dollar deep tubewell project. This project's Pilot Study into Optimum Well Design (1987-1992) in its 20 volume reports also included reports on water quality. Within this project Motts McDonalds, one of the major water contractors worldwide and the largest contractor for the water sector in Bangladesh for the last 20 years (Motts Report, 1997-98), was assigned to sink 13,000 deep tubewells (DTW) in Comilla and

Manikganj (1987-1992). In 1989-90 when DTW were being sunk, huge amounts of sodium chloride were found. A survey was conducted to test if the water was suitable for agricultural purposes. It was decided that the salinity was localised and not widespread. The project was continued. Many questions now emerge. What was the basis of the decision to continue the project? What parameters were tested or not tested before decisions were made? What was the sampling procedure? Were the impacts on the environment monitored? Today Comilla is one of the worst arsenic-contaminated areas in the country. Using the advantage of hindsight it can be argued that the opportunity to test water quality as per the WHO guidelines were missed and along with the possibility of detecting arsenic early on.

Case 2: Between 1989 and 1994 DFID financed a US$ 150 million research project in Mymensingh under the Flood Action Plan. One component of this research aimed to study the impact of water quality on humans and fish. Arsenic, which is one of the 17 parameters in the WHO guidelines, could have been tested but was not.

Case 3: The British Geological Survey Report (1992) was also a missed opportunity since its 1997/98 survey raised serious questions about the quality of data and procedures. The BGS report has been quoted extensively and used for making both policy decisions and strategic focuses. The reliability of BGS data was of utmost importance since the agency had the responsibility 'to produce reliable data base to be used to describe the hydrochemistry of the main aquifer…(and) to include the modes of occurrence of trace elements that may be toxic to biological systems.'

The BGS survey used a small sample size (327 site samples, of which 307 were wells deeper than 100 m and only 20 samples were from wells deeper than 200 m) to draw its conclusions. The study concluded that, on average, 27 per cent of shallow tubewells were unsafe. This figure is misleading because it gives the impression that the other 73 per cent are safe. The reality was that in some districts the (Chandpur) 80 per cent of wells were contaminated while in others (the Panchghar) less than one per cent were contaminated. Averages serve little practical purpose. In fact, they misled policy makers, who began to believe that a large percentage of Bangladesh is safe from arsenic-contaminated water and that deep wells are safe.

TECHNOLOGY, NOT PEOPLE, IS THE FOCUS

Encouraged by the 1992 findings of the BGS, donors, NGOs and government agencies decided to continue with the sinking of tubewells. The DPHE, with support from the World Bank and other donors, undertook, in 1992, a project to install 6,000 tubewells. Some

donors continue to allocate resources for purchasing field kits for testing water and filters for mitigation. As of the writing of this paper, no funds have been allocated to support or treat the affected people. To date, responses to the crisis have been fragmentary; the overall strategy lacks coherence.

Interventions that rely on the use of technology can have unintended consequences. This is particularly so in developing societies where the social capacity for adapting to regulating technology is weak. Moreover, international aid agencies, multinational companies and aid giving governments are uninformed about the limitations of developing societies; their processes of decision-making are divorced from local realities. As a result, development harms the very people it intends to serve and reinforce inequality and poverty. Bangladesh, because of its dependence on international aid, is an example. The bulk of foreign aid received is pocketed by the elite (*The Daily Star*, 2001). Funds for the water programme are allocated no differently.

World Bank	US$ 44 m loan (for BAMWSP) is being used to screen tubewells using field kits and identifying patients to assess the spread of contamination. The World Bank money is expected to purchase 50,000 testing kits (Merk) and to sink about 55,000 more deep tubewells.
DANIDA	US$ 50 m to NGO Forum to sink tubewells and test tubewell water
CIDA	US$ 4 m to look at technological options (testing filter technologies)
DFID/BGS	US$ 2 m to map arsenic spread. Where safe zones are detected DPHE has arranged to sink 6,000 tubewells (Prothom Alo, February, 2001).

ETHICAL CONCERNS: RIGHT TO LIFE

The Bangladesh government and UN agencies recognised the seriousness of the arsenic contamination of drinking water in the country in 1993. Nine years later, work to ameliorate the situation remains undone and it is unclear why. Acknowledging that the problem exists and taking responsibility for action would be a step in the right direction. But this has not happened. As a result, harmful policies continue to persist. Water agencies are non-transparent and use incomplete data to downplay the extent of the arsenic crisis. They continue following inappropriate policies. For example, the DPHE and UNICEF mention only that 'Bangladesh has about 27 per cent contaminated tubewells,' but do not mention people may still use some of the tubewells that fall in the 27 per cent. If that is so what will be the percentage of affected iff they drink from the poisoned wells?

The arsenic crisis points towards the moral obligations of the international community, aid agencies and relevant water departments of the Bangladeshi government.

Successive governments of Bangladesh have presided over the arsenic problem. Venerable agencies in the international aid business were involved as major actors in the process of development. The solution does not lie in pointing the finger at one government or particular agency but in assuming of collective responsibility. We need to rethink the process of development that relies on technology to bring solutions. Technology can provide immediate benefits but can cause harm; in the long run arsenic contamination is one example. The absence of effective governance in the water sector exacerbates the problem. Standardised solutions, packages of institutions and technologies, cannot provide enduring answers as conditions change over time and new constraints emerge.

A recent publication identifies the challenge as the need to develop and institutionalise sets of basic governance principles that enable society to organise effective and equitable responses to water problems (such as groundwater depletion or arsenic) when and where they are needed. Moench *et al.* (2003) suggests that the key elements of any effective governance arrangement must include:

***Freedom of Information**:* How information is generated, disseminated, analysed and controlled establishes the text with which perspectives are formed and solutions negotiated. Information is not neutral. Different institutional contexts show bias by generating information that suits their worldviews. As a result, diverse sources of information are important and organisations that produce primary base-line information (such as groundwater level or stream flow data) need to be institutionally isolated from implementation functions and the biases those create. In addition, baseline data needs to be accessible to all stakeholders. Data themselves are, however, only of limited use unless they can be interpreted and analysed. This is where the role of social auditors is key. Particularly in fields such as water resources, where management options depend on a combination of basic scientific and wider social factors, existence within a society of the capacity to analyse and identify needs and alternatives is critical.

***The right to organise**:* Unless the right to organise is widely recognised and accepted as a basic governance principle, many stakeholders won't be able to play an effective role in water management. Equally important, unless the right to organise exists, water management approaches cannot evolve over time in response to changing conditions. From a social perspective, organisations and the institutions created to respond to one set of problems at one moment in history are likely to be inappropriate as responses to other problems or other contexts. As a result, the larger governance framework needs to be structured in such a way that organisations can emerge and die as the social demand for their existence waxes and wanes.

Explicit or implicit mechanisms to balance power in society: National constitutions generally contain core mechanisms to balance the power of individuals and interest groups. Divisions between legislative, executive and judicial functions are, for good reason, at the foundation of most democratic governance systems. Balance-of-power concepts are equally important in the more constrained realm of water governance. When the mandate for setting a water management agenda (i.e. the planning and policy making function) is located within an executive agency (such as a government irrigation department or implementation NGO) the agenda will tend to match the implementation mandate of the executive organisation. Ideally, the responsibility for setting the water management agenda should reside in a body that represents all key stakeholders. This function would be distinct from executive and judicial (dispute resolution) mechanisms. How this can be actualised in the water resource context remains to be explored.

A societal process that provides inclusive space to the above attributes can begin the path that can force agencies of the aid industry and governments become more transparent and accountable. Future policies should be formulated by considering all potential negative impacts that technology can unintentionally bring along with its objective of mitigation.

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RAVAGED ECOLOGY, CRUEL DISPLACEMENT, IMPOVERISHED LIVELIHOODS

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ABSTRACT

The Chotiari Reservoir Project is no different from other water related mega projects executed in Pakistan, though it exhibits a greater degree of human rights violations ecological destruction and poor governance. Unless the historical rights of the affected communities are legally recognised and the allocation of water is based on equitable shares for all communities irrespective of their class, social and political background, their human rights and environment will remain unprotected. The issue of good governance is related to this question: 'Who controls the political power?' The extension of democratic processes to the grassroot level and the strength of democratic institutions and public participation in the functioning of institutions could serve as the lever for the promotion and protection of human rights and progress.

INTRODUCTION

If one has to pick a single example of a water related project from Pakistan that includes massive damage to the ecology, blatant violations of water rights and a total disregard of the livelihood concerns and human rights of the affected communities, then the Chotiari Reservoir in the Indus basin in Sindh Province of Pakistan would be the ideal case.

The Chotiari Lake area is characterised by wetlands, riverine forests, desert scrub and sand dunes. It is comprised of small riverine depressions, lakes, narrow interdunal *dhands* (small natural lakes), swamps, irrigation channels and agricultural lands, providing an ecological richness that is rare in Sindh. The Chotiari Reservoir area is a haven for migratory and resident birds, hogdeer, crocodiles, jungle cats, smaller mammals, and a variety of fish and reptiles. It also supports grazing, fishing and a range of agricultural activities.

The Chotiari Reservoir Project is designed to increase the storage capacity of lakes in the Chotiari area of Sindh in order to increase the irrigation discharge for 150,000 acres in the Umar Kot District. The capacity of the reservoir is being increased to retain 0.95 MAF (million acre-feet) of water, which will flood an area of approximately 100 square miles. The construction cost of the reservoir is likely to escalate to over five billion rupees,

compared to the previous estimate of 1.5 billion rupees that was made when the project was expected to be completed in 1997. The Chotiari Reservoir Project was part of the Left Bank Outfall Drainage Project (LBOD). Financial assistance for LBOD was provided by a group of donors led by the World Bank. The resettlement plan was supposed to be executed by the Government of Sindh, under the supervision of the World Bank.

As the Chotiari Project was envisaged at the time of inception, the water surface area of the reservoir will become 2.5 times more extensive than previously. As a result, some 47 villages will be inundated, displacing at least 594 families and flooding over 45,000 acres of land. Vast tracts of grazing land will be affected as a result of the reservoir. The loss of productive cultivated land will not only cause a significant impact on the agricultural output of the area but will severely disrupt the socio-economic lifestyle of the communities forever. Families living in this area for many generations will be forced to vacate their lands and their traditional way of life in the name of progress. Herdsmen who for generations have used the existing lake fringes as pasture land will have to move away in search of alternative appropriate grazing sites. Fishing communities that have been harmonised with the ecology of the lakes will be stranded on the shores of the vast reservoir. With the substantial increase in the water level of the lakes all grass species and trees and the complex ecosystem around the lakes will be drowned. The likely increase of water seepage and waterlogging will contribute to the destruction of adjacent areas, risking the loss of good arable land and increasing the stress on the flora and fauna of the area.

As work on the project has progressed from the mid 1990s to the present not only have these adverse impacts been felt, but there have been significant wrongdoings associated with the land acquisition, compensation and resettlement plans as well as with the mitigation measures for adverse environmental impacts.

The government is determined to complete construction of this controversial project despite the fact that the World Bank and other donors discontinued financial support after 1996 when the government was seen as being unable to address scandalous shortcomings in project implementation. Nonetheless, the government is busy completing the construction of embankments and, in the process, ruthlessly bulldozing anything coming in the way, including houses and grown crops of poor peasants. It includes land and houses of the villages that were not even surveyed.

ECOLOGICAL ISSUES AND THE ENVIRONMENTAL IMPACT ANALYSIS

An Environmental Impact Analysis (EIA) was carried out for this project. It identified the habitats and wildlife that would be affected or destroyed, that is, habitats for a rich variety of fish, birds, reptiles and mammals in deep and shallow pools of wetlands, aquatic margin vegetation, reed bed swamps and woodlands. However, it failed to carry out a proper

survey or assessment of adjacent wetlands where the displaced wildlife is expected to migrate. Local knowledgeable people doubt the surrounding areas have the necessary carrying capacity, and therefore the safety, for wildlife.

Two other shortcomings of the EIA were that it neither included an evaluation of alternatives to the proposed reservoir nor the historical/cultural heritage of the area. It is possible that improvements in the existing system of lakes combined with a proper de-silting of pre-existing canals to rehabilitate/restore an old system designed and functional since 1932 could have taken care of many of the needs the Chotiari Project is supposed to address. Among the important historical/cultural aspects of this area is that it is the focal point of the historical Hur movement that was a part of the liberation struggle.

AFFECTED COMMUNITIES

Not only will the project have a significant ecological impact, but the immediate and long-term impact on the pastoral and fishing communities have been inadequately addressed and can be expected to be devastating. There are vast grazing grounds in the Chotiari Reservoir area that have supported a herding community for centuries. Grazing along the existing lake shores is perennial and maintains the herds throughout the dry period. After completion of the reservoir, however, the grazing lands will be inundated and the herdsmen will be dislocated by force without any resettlement or proper compensation; they will be homeless. The human and historical rights of the herdsmen community are not even recognised in the Resettlement Action Plan (RAP). Remaining on the shores of the enlarged lake is not an option either, as that area is mainly composed of sand dunes. Even if new grasslands were to generate in the future, there is no option for the herdsmen to survive the many years of transition while the project is under construction.

Similarly, the loss of extremely productive food chains created at the currently existing aquatic margins may devastate the fishery. Such loss of livelihood for the traditional fishing community in the area has not been sufficiently evaluated or addressed. In addition, the production loss to fishermen does not take into account the construction and filling time of the reservoir which may extend to three years. During this period the fishing is unlikely to provide them subsistence earning as the seasonal supply of water to the lakes will not take place. According to the EIA for the project, commercial fisheries are dominated by 'major carps' which breed in the Indus River and require flowing water. In the intervening years that it may take to artificially re-establish a new fishery on the reservoir system, the fishing communities may not have resources to survive the temporary loss of their livelihood.

Even in the long run, the existing small boats and nets of the fishermen would not be appropriate for a deeper and larger reservoir. The fishing community has neither the

resources to purchase large boats and nets, nor does it have the skill to manage its livelihood under these conditions. The existing fishing license system is likely to be converted to large fishing contracts. In this case, resourceful contractors from outside are most likely to take over the fishing business.

There are significant impacts of this project on many communities within the Indus basin, not only those directly adjacent to the site. When completed, the project will cause harm to communities living in the Indus delta downstream of the Kotri barrage as the water available to these communities will be well below historical volumes. This is a fundamental flaw in the planning of the project. Even without this diversion, the Indus delta is not receiving its legitimate share of water. The river water rights of the downstream communities are being usurped by those living upstream. The strong agricultural lobby of this country has progressively inflicted ecological damages affecting the lives and livelihoods of the communities living in the delta and its coastal regions. In times of scarcity and drought this flaw can be expected to come into sharper focus. Political pressures are likely to assure that enough water is retained in the reservoir to maintain the newly irrigated lands. This could inflict devastating hardships on the downstream users who could be left with little or nothing.

COMPENSATION AND RESETTLEMENT ISSUES

It is stated that the social objective of the Reservoir Project is to provide alternative and even improved opportunities at the resettlement site to those dispossessed of lands, houses, livelihoods and community life, in a planned way. In 1994, the Resettlement Action Plan (RAP) for affectees of the Chotiari Reservoir was drawn up and consequently the Chotiari Resettlement Agency (CRA) was created to implement the plan. A resettlement site was selected some 80 km from Chotiari. The plan was recently shelved and it is now officially stated that no resettlement will be done at any site. The affectees will be paid a nominal amount and the issue of resettlement shall be considered closed.

In any case, the RAP had shortcomings with respect to:

- The level of participation of the affected communities in the planning and execution of the project.
- Adequacy of the Land Valuation Committee award.
- Assessment and disbursement of the compensation.
- Selection of the resettlement site.
- Performance of the existing institutional arrangements.

A Land Valuation Committee (LVC) was notified to formulate the guidelines for cash compensation rates to be paid for land acquisition and resettlement of residence or

businesses. This committee, however, did not make a correct assessment of the market value while fixing the rates of compensation. Similarly, the government agencies failed to carry out the land acquisition process in a just and transparent manner. The process was not explained to the community; land surveys were not conducted properly and they contained bogus land owners and bogus entries. The lists for land compensation were never made public. The process of land compensation began in 1995. So far compensation has been paid to about 260 land holders. However, the rich and powerful local landlords were compensated at the highest rates and the poor were offered the lower rates. The powerful lobby managed to drain over 76 million rupee (80 per cent of the disbursement) to fake owners. The poorer, on the other hand, were referred to court when they refused to accept the lower rates they were offered. Their cases are proceeding without any hope of resolution.

GOVERNANCE

We find both the processes as well as the institutions for planning, implementation and monitoring of the project to be incapable of safeguarding the public interest or of protecting the rights of poor communities. Public participation and access to information is discouraged at all levels of planning and monitoring. The structures of all related institutions such as CRA, EMC (Environmental Management Committee) and the Water and Power Development Authority (WAPDA) are highly bureaucratic. The Sindh and federal governments are dominated by a strong agricultural lobby. The major political parties and the bureaucracy always welcome such projects because they get monetary and other benefits from them.

Wide dissemination of accurate information to the public and transparency regarding the project's objectives, policies and programmes, is crucial to the success of the project. In theory, the official policy for such World Bank financed projects strongly favours public disclosure and widespread dissemination of all of the project's reports. But information, reports and documents related to the Chotiari Reservoir Project which are in possession of various agencies including CRA, WAPDA and the World Bank missions visiting Chotiari have not been shared with the affectees or the CBOs/NGOs. The public has no information about the compensation made and measures actually being taken to mitigate the adverse environmental effects.

The EMMP (Environmental Management and Monitoring Plan) of 1998 required the following actions to be taken without any delay:

1. Compliance with the obligations of Land Acquisition Act.
2. Early and just payment of compensation amount to the affected farmers.

3. Comprehensive EIA study for Chotiari Reservoir.
4. Resettlement Plan for Chotiari Reservoir.
5. Design modification of storm water inlets, particularly for inlets provided at low levels.

No action on the above recommendations has been taken. Like most other projects, it is not expected that the recommended mitigation measures will be taken.

The list of participants of Environmental Management Committee (EMC) meetings shows that almost all of them belong to the typical government organisations. IUCN and WWF, are the key members of the EMC for overseeing the environmental aspects of project implementation. By not playing an active role and not attending the meetings, both organisations have failed to safeguard the public interest in the project.

There have been mass scale misappropriations in compensation funds. For obvious reasons, the public representatives, bureaucracy and local power elite have been supporting those who were involved in corruption.

The institutional framework presented here is defective. The international financial institutions involved in this project have skillfully made it appear that the responsibility has shifted to the community level. They have been instrumental in creating both a project NGO and an independent monitor of the project. However, neither are effective – the NGO because it is under the direct control of CRA, and the independent monitors for more complex reasons. In fact, it is fair to say that effectively there is no provision for public participation or democratic control over the planning and executing agencies of this project.

CONCLUSION

The Chotiari Reservoir Project is not different from the other water related mega projects executed in Pakistan, though it exhibits a greater degree of human rights violations and ecological destruction together with poor governance. Unless the historical rights of the communities are legally recognised and allocation of water is based on equitable shares for all communities irrespective of their class, social and political background, their human rights and environment will remain unprotected. The issue of good governance is related to the question: 'Who controls the political power?' Extension of the democratic processes to the grass root level, strength of the democratic institutions and public participation in the functioning of institutions could act as the lever for the promotion and protection of human rights and progress.

Governance Examples

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DECENTRALISATION FOR DEVELOPMENT

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ABSTRACT

The devolution of decision-making authority to local levels has remained an illusive goal even now that Nepal is a multiparty democratic polity. However, Self-help groups (SHGs) can successfully perform many natural resource management functions. In fact, these groups have emerged as successful example of decentralized institutions that can fulfill local level governance tasks. This paper argues that SHGs are a potent institutional arrangement for bringing about accountability at the local level.

INTRODUCTION

Decentralisation means many different things to different people. Politically, the handing down of decision-making authority from the state to the local level may be considered to be an attempt at decentralisation. In Nepal, the concept of decentralisation has remained a hostage to the legacy of the party-less *panchayat* polity, in which some of the central government's authority was transferred to elected bodies or *panchyat* at the district, town, and village levels. Under the multi-party system too, this organisational structure has remained unchanged; the bodies are just named differently, the District Development Committee (DDC), Village Development Committee (VDC), and the municipality. The structure and jurisdiction of these bodies are more or less the same as those of their party-less incarnations. Each year a relatively large proportion of our national resources is allocated to these agencies to spend on local development. Resources are provided to them in the form of government grants but they also have the authority to collect tax. Despite the involvement of local governing bodies, however, even basic indicators of development continue to go from bad to worse with each passing year.

One major cause for alarm is the population growth rate, which is currently 2.4 per cent per annum. At this rate Nepal's population is expected to reach 37 million in 2015 AD. One result of this increase is a rapid decrease in per capita land availability, which stood at 0.15 ha per capita in 1998. For Nepal, where 80 per cent of the population depends on agriculture this spells disaster. Lack of land is a significant cause of the widespread poverty in Nepal (40 per cent of the population lives below the poverty line). Furthermore, the distribution of agricultural land is highly skewed; it reflects the stratification conditioned by

orthodox Hinduism, which for centuries was the basis of a state polity that favoured high-caste people. In 1990, the wealthiest five per cent possessed 40 per cent of the land while the bottom 60 per cent owned only 20 per cent of it. Most people in rural regions depend on employment outside of agriculture to make ends meet. Yet the high rate of illiteracy (76 per cent of females and 54 per cent of males aged 15 and above in 1998) is a major constraint limiting non-agricultural employment opportunities.

The country's planners and political and bureaucratic leaders show a lack of understanding of and sensitivity towards the progressive deterioration of living conditions. They do not know how to stall the decline. Successive governments have not been forthcoming in the genuine devolution of political authority to the people who would benefit from its exercise. Instead, local level bodies (DDCs, VDCs, and municipalities), taking advantage of the liberalised political atmosphere, have organised themselves into associations and regularly gang up on the government. Trade unions campaign to have more authority devolved on themselves although, in terms of transparency and accountability, the functioning of most leaves much to be desired.

The basic system of planning and implementing development programmes continues to remain highly centralised, and sectoral line agencies in the districts essentially function as extensions of the central bureaucracy in Kathmandu. Both resources and targets are handed down to them from the centre and 'meeting the targets' on paper has been the regular and perhaps inevitable, outcome of this approach. Declining professionalism and morale among civil servants, who are disillusioned by increasingly overwhelming political interference, has further aggravated the problem.

District bodies complain that governmental line agencies are outside their control. But even if they do not have such control, local bodies are allocated relatively large sums of money in the form of tied and untied government grants and they can mobilise resources locally using their taxing authority. Investment of their financial resources should yield tangible benefits, but in fact, people are generally deprived of services and benefits. Expenditures of resources by local bodies are generally governed by three considerations: equal distribution among VDCs and wards, greater mileage for the political parties to which their members belong, and the personal benefit of politicians. In such a situation, allowing DDCs to control line agencies as was proposed in the 1999 Local Self-Governance Act would be tantamount to jumping from the frying pan into the fire. The concept of decentralisation in Nepal remains in the doldrums where it has been for past several decades.

SELF-HELP GROUPS (SHGs): THEN AND NOW

One redeeming feature of multi-party politics is the opportunity for the evolution of SHGs at the local level despite widespread poverty, illiteracy and the inequitable distribution of

resources. SHGs have traditionally been strong in Nepal. The following account of the management of a traditional irrigation scheme is an example.

> One early morning in late spring in 1969 in a Karnali village in western remote mountains (the nearest bus stop was eleven days walk away at the time), an able-bodied man from each household converged on the village centre to bring water over a pre-existing Jachauri Kulo channel in preparation for their paddy transplantation. Since Section Officer in the Home-Panchayat Ministry gave grants to such local projects, the villagers must have built it just with that kind of government money. But, to my condescending query as to its year of construction, the answer was: 'during the reign of Malleru king', a ruler whom neither the villagers nor the Royal Nepal Academy research team in the village at the time (of which I was the anthropologist member) could temporally establish. A 75-year-old man in the village only knew that the canal was there when his own grandfather was a kid. It was functioning effectively year in and year out, very much unlike its more recent government-funded counterparts which barely last beyond their inaugurations. A more knowledgeable source in Kathmandu estimated that the canal irrigation technology was probably brought to the Karnali Mountains by the rulers of the Indo-Gangetic plains who in the fourteenth century fled the Moghul invasion and established themselves as the rulers in those remote mountain regions. The canal was thus estimated to be around six hundred years old. Other antiquities in the region confirmed that the canal was a part of the larger and robust civilisation that flourished there centuries ago.
>
> The Kulo was managed by a Kumthi, which comprised of a team of three Kumthels i.e. Kumthi members, who were remunerated after harvest at the rate of one kathe pathi (which is more or less half of the standard pathi) of paddy per muri (four muri = ropani; 20 ropani = ha) of land. Each year, the Kumthels were retained or selected anew by all the farmers owning paddy fields in the village. Being able-bodied, relatively poor and having a reputation for being impartial constituted the basic qualification for being chosen as a Kumthel. The Kumthels kept track of their villagers' proposed dates of transplantation and made sure that they received water two days in advance. They brought anybody stealing water at night to the community 'court' of high caste farmers assembled in an unplanted terrace to be rigorously interrogated, while women and their low caste neighbours went about the actual chore of transplanting.

A study of the kulo two decades later in 1990-91 found that the irrigation system not only remained intact and functioning but was even further elaborated to make it more efficient. The villagers had made some structural improvements using the savings from the government grants that they received for other projects in the community.

The concept of user group made its way into government policy as part of the strategy of the newly created Ministry of Panchayat and Local Development in 1980 and was officially incorporated in the Decentralisation Act of 1982. Even when the country experienced a major political transformation from a party-less to a multi-party system, user groups remained part of the stated government policy, largely due to their democratic ethos. Another success story related to user groups comes from Nepal's Community Forestry programme, under which forests are managed by Forest User Groups (FUGs). The forest bureaucracy organises forest users into FUGs and extends support for capacity building so that each group can manage its own forest.

Following the nationalisation of forests in 1957, Nepal's forests went into a rapid decline as self-serving politicians and forest officials used forest resources to meet various ends and the people felt no sense of ownership. However, conditions began to change with the introduction of user management of community forests in 1988, a step based on the Decentralisation Act of 1982. Consequently, at least in the hill regions of Nepal, a significant turn around has been accomplished in improving the condition of forests which had been threatened by large-scale desertification due to incessant depletion.. As of January 1999, FUGs managed about 500,000 ha of forest and a large but unknown member of informal FUGs, too, had taken charge of their own forests all across the country.

Another success story is that of the Small Farmer Cooperatives Limited (SFCL), a programme introduced by the Agricultural Development Bank (ADB) of Nepal with assistance from GTZ. The ADBN has been implementing a Small Farmer Development Programme (SFDP) since 1975 but its effectiveness had steadily deteriorated due to increasing politicisation and high overhead costs. Decreasing recovery rates on loans southern jeopardised its well-being. The SFDP was clearly heading for an unceremonious closure. However, with GTZ technical support a number of SFDP projects were turned into farmer-managed SFCLs and thereby saved. To govern their management a three-

tiered structure was conceived and implemented. Small groups of farmers function at the grassroots levels. These groups are federated into inter-groups at the ward-level and into SFCLs at the VDC level. The programme stimulated greater mobilisation of local savings, promoted increased lending to members, achieved more effective use of credit and improved recovery rate. SFCLs now obtain bulk credit from the ADB and retail it to their members for a small commission. No grants or subsidies are provided by the ADB. Locally recruited officials independently manage the cooperatives. As of 1998 there were 73 SFCLs in 29 districts with a total of 42,194 members, including a female membership of 13,597.

In the private sector too, there has been a nation-wide movement towards forming self-help groups, mostly under the impetus of international NGOs but many have emerged spontaneously too. Mobilisation of member savings to invest in small income generating schemes, social reforms like controlling drinking and gambling, and the creation and maintenance of local infrastructure such as drinking water and managing community forests have been their regular activities. Because women constitute one third of the members SFCLs has improved awareness about how women can fulfill decision-making responsibilities too. In a few areas, higher order organisations in the form of regular cooperative societies have also been formed with these small self-help groups as their grassroot constituents.

GOOD GOVERNANCE CONDITIONS WITHIN SELF-HELP GROUPS

Three basic attributes ensure the conditions for good governance in the functioning of the whole range of SHGs mentioned above. Firstly, an SHG is an exclusive organisation of the direct beneficiaries or users of a certain activity, infrastructure or service, and it is democratically organised. Secondly, members have valuable stakes in common, mostly in the form of regular and reclaimable cash savings in groups. This condition assures their regular participation in the group's activities. While inter-caste, inter-class and gender disparities have traditionally acted deterrents to universal participation in community decision-making, stakeholding by members has altered the scene. Even the weakest members now find it necessary to assert their rights in order to protect their interest. The mobilisation of cash savings in groups has been a potent instrument of rural transformation; it not only helps maximise capital mobilisation and investment for the development of the community but also effectively empowers the weaker sections of people who would otherwise have remained irredeemably stranded on the lower rungs of the hierarchical ladder constituting Nepali society. Thirdly, because of participatory and transparent management, the group leadership is accountable to its members and must spend its time and energy for collective betterment.

Because these attributes are embedded in the functioning of the groups as conditions of good governance, members strive to fulfill other needs as well. These needs primarily

consist of access to new information, opportunities for skill enhancement, emerging technologies and inputs. Based on their newfound power as an organisation, many members are able to access resources from local bodies and other sources. However, much more could happen if the roles of government service delivery agencies were redefined so that they were responsible for providing services to SHGs.

SHGs are usually more efficient and effective when they are multi-functional in scope. For instance, CARE-Nepal under its Remote Area Basic Needs Project found that forest user groups (FUGs) in Gorkha, Nepal, that undertook more than forest conservation was more effective than their uni-functional counterparts. In Gorkha FUGs also managed drinking water and irrigation schemes catering to the same users.

What is the role of locally elected bodies in development? Compared to SHGs, they are at a disadvantage. The common stake holding in SHGs helps ensure good governance as office bearers are constantly under pressure to act both transparently and accountably. The case of local bodies is different. Because most villagers are illiterate and poor, office bearers get elected mainly based on persuasion engineered by money and muscle power. The money-dependent nature of electoral politics creates incentives for most politicians to amass wealth while in office. This situation suggests that the political process needs reformulating. People who elect officials to positions of power are unable to demand accountability from them. Consequently, locally elected bodies mismanage resources. Where the density of SHGs is high in a community, however, VDCs have been found to be more accountable and less corrupt.

TARGETING DECENTRALISATION: SHGs

Though both are 'local', structural difference exists between local SHGs and local elected bodies. Given this difference, it is necessary that decision-making authority be devolved to SHGs. In operational terms, this approach implies that SHGs should be represented institutionally in local bodies. For the planning and implementation of local development activities, SHGs and not elected bodies should form the basic unit. Local bodies should provide support services to SHGs at various levels. The powers entrusted to elected bodies at the village or district levels should be supportive.

From this perspective, decentralisation should be conceived as empowering and building the capacities of SHGs. The roles of VDCs and DDCs should complement and support those of SHGs. Guided strictly by this criterion central-level authorities should devolve authority to VDCs and DDCs. Only under such conditions would the re-assignment of sectoral line agencies to come under the umbrella of DDCs make sense.

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FARMER-MANAGED IRRIGATION SYSTEMS (FMIS): A MODE OF WATER GOVERNANCE

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ABSTRACT

The distinctive feature of farmer-managed irrigation systems (FMISs), a mode of natural resource management, is the participation of the members of the farming community in management decisions. A FMIS system comprises structures, methods and procedures for joint management and decision-making. In an irrigation system managed by farmers, water is considered to be a community resource and it is water which unifies farmers into a group that collectively makes decisions about for acquiring, distributing and applying water for agriculture. FMIS, can promote polycentric mode of governnace and in supporting equitable management of water.

MODE OF GOVERNANCE

Governance is a key element in the management of all types of irrigation systems. Irrigated agriculture is one of the main guarantors of food security and, at global scale, is the predominant user of fresh water. To achieve both food security and sustainable water use, it is crucial to manage or govern irrigated agriculture well. The term 'governance' implies certain notions of the right to make decisions about the use of water and to obtain benefits from the exercise of that right. Governance includes the structures and methods of control which an organisation uses to make decisions about water allocation. Decisions are based on the rules and processes of joint decision-making.

Irrigation governance has two common forms: agency-built and -managed and farmer-built and -managed. Each has been in practice for a long time and each provides many lessons. Since FMIS is widely practiced and its key feature is the involvement of members in decision-making, it can provide useful lessons especially with regard to the increased pressure on fresh water caused by inter-sectoral competition. FMIS also fits in with the trend toward promoting polycentrism of institutions while organising societal processes.

TYPES OF IRRIGATION SYSTEM MANAGEMENT

In the last few decades, the responsibility for many irrigation systems has been transferred to farmers' organisations. Some are jointly managed by the agency that built the systems and farmers' organisations, while others are managed solely by farmers' organisations. In both approaches, farmers' organizations have important roles to play.

Agency and management transfer systems

In the 20th century, agencies such as irrigation departments were entrusted with the responsibility of governing newly-built irrigation systems. In such Agency-Managed Irrigation System (AMIS), the agency assumed responsibility for delivering water to farms, when it was required preparing land, providing inputs like seeds and fertilizers, and prescribing the types of crop to be grown. The department also made decisions about harvesting, pricing, and marketing produce. In essence, the agency made all decisions and controlled all activities. Agency staff did not consult the farmers and farmers minimal role in management of the system.

Disputes between farmers and agencies are common in AMIS. Disenfranchised farmers often do not comply with the rules framed by agencies and agencies default on their obligations. Even when management responsibilities have been transferred to farmers, activities related to training, research and innovations in water management have rested with agencies, which in many cases, scuttle these responsibilities or only provide lip service. Government departments are the source of funding for performing such activities, but officials do not feel responsible or less accountable to users. Thus the allocated funds are not used for much-needed extension activities.

To overcome the limitations of AMIS management responsibility has been transferred more systematically to farmer organisations. To promote participatory management, farmers now perform many management functions. In the joint management approach, things like decisions about maintenance and water release schedules, and cropping pattern are made jointly by farmers and irrigation department personnel. The department still own the headworks and head reach canals, but water users form a self-regulating, self-supporting and self-governing organisation to manage the system. In some places, management responsibilities have been transferred completely to farmer organisations which undertake the day-to-day activities related to water allocation and distribution. Some such groups are also being organised into federation, in which farmers assume total responsibility for management.

Farmer-managed irrigation systems

In FMIS, users organise management committee composed of representatives elected by farmers for a specified tenure. It is this committee which makes decisions regarding the

management of the irrigation system. The characteristics of an FMIS include (a) direct involvement of irrigators, (b) effective monitoring and sanctions and (c) holding officials accountable (Tang and Ostrom, 1993). Farmers are involved in the day-to-day activities of irrigation management, including water acquisition, allocation, distribution, maintenance and operation, decision-making, resource mobilisation and conflict resolution (Pradhan, 1989). Ownership of the irrigation infrastructure also rests with the farmers' organisation. In FMIS, agencies perform regulatory activities like defining water rights for various irrigation systems and providing assistance to farmers when necessary.

FEATURES OF FARMER-MANAGED AND AGENCY-MANAGED IRRIGATION SYSTEMS

It is important to understand the distinction between agency-managed systems and farmer-managed system in terms of their intrinsic values. The designs of irrigation infrastructures in AMIS are based on the disciplines of engineering and agronomy. The practices are derived from predetermined cropping patterns assuming irrigation efficiency, effective rainfall, and so on. In contrast, the irrigation infrastructure in FMIS do not entirely follow standard engineering designs or practices. Abernethy (2000) distinguishes between farmer-managed and agency-managed irrigation systems on the basis of equity. Equitable distribution does not mean equal distribution to everybody. Instead, it means the distribution of water according to a system of rules which everybody can understand. Sometimes rules allow different groups to receive quite different quantities of water, but the users consider the difference acceptable because they know the reasons. Rules are transparent and easy to understand, operate and monitor.

In an irrigation system, water management must meet three objectives: adequacy, equity and timeliness. Adequacy means supplying the volume of water essential for crop growth. Equity means that everybody using the system shares the available water or burden in a fair way. Timeliness means supplying water when the soil and crop need it. In most government-managed systems, the objective of adequacy dominates the plan of operation. FMIS, on the other hand accord primacy to equity as the dominant objective. Prioritising equity does not, however, compromise adequacy. In fact, equity also means sharing a shortfall if water is not sufficient in a given season. Many FMISs have context specific arrangements for sharing benefits and burdens.

CHARACTERISTICS OF FARMER-MANAGED IRRIGATION SYSTEMS

In Nepal, farmer-managed irrigation systems have in existed for centuries (see Bihari Krishna Shrestha's paper in this volume) and over 70 per cent of the country's irrigated

TABLE 1
DIFFERENCES IN DESIGN PRINCIPLES OF IRRIGATION INFRASTRUCTURE BETWEEN AMIS AND FMIS

Design principles of Irrigation Infrastructure	FMIS	AMIS
Operational Objectives	Simplicity	Flexibility
	Transparency	
	Equity	
	Flexibility	
Irrigation Duty	Technical and	Technical requirements
	social requirements	
Functions	Hydraulic and managerial	Hydraulic

Source: Parajuli, 2001

agriculture is served by FMISs. By and large, these systems are autonomous, self-governing, decentralised entities. In a each FMIS a community has developed its own system of organisational norms and values to manage water. These norms are based on obligations and on rights to use water. The roles and functions of organisations differ according to the type of system: hill, river valley or Tarai. The physical environment influences the intensity of the tasks of water acquisition, allocation and distribution as well as other activities, like maintenance, performed by the organisation. In addition to, equity and transparency are defined by the following characteristics:

Size: Farmer-managed irrigation systems do not have to be small. The area irrigated by existing systems ranges from a few hectares to thousands of hectares.

Irrigation tasks performed: By and large, an irrigation organisation deals with the interrelated tasks of water acquisition, allocation and distribution, resource mobilisation, system maintenance and conflict resolution. The level of sophistication depends upon the types of activities it performs.

Organising factors: FMIS are organised for performing different activities, an organisation whose nature varies from system to system. External factors modify the role of FMIS organisations as the context changes.

***Flexibility to respond to changes*:** An irrigation organisation is sensitive to the environment and the tasks it performs are influenced by changes in physical, socio-economic and environmental changes. Since farmer organisations are flexible, they tailor their methods of water allocation, labour mobilisation, and water distribution to suit the context.

CHARACTERISTICS OF FARMER IRRIGATORS' ORGANISATIONS

FMIS in Nepal include a wide variety of organisational types and management styles. Methods internal and external resource mobilisation, maintenance practices, and water allocation and water distribution methods vary among FMIS to suit the different environments and the needs of the people they serve. While each FMIS has a distinctive characteristics, all have the following features:

Annual meeting: At the annual meeting the irrigators as a body make decisions about irrigation water management. They make decisions about plans and programs for different irrigation tasks, review the performance of the previous year, audit and settle accounts, and elect new officeholders.

Management committee: The irrigation management committee implements the decisions that the general body of irrigators makes. The performance of the officeholders is reviewed each year and office holders are held accountable to the farmers' body.

Constitution, rules and regulations: Many FMIS do not have written rules and regulation, which are known to all within the community. Regular interaction between the committee and the irrigators is more important than having a written constitution.

Levels of organisation: The number of levels an irrigation organisation has to depend on its size and complexity of the tasks it performs. Each level has specific tasks. Lower levels are generally responsible for resource mobilisation and water distribution they ensure that the members of the community are all kept in the irrigation loop. In FMIS, each village usually has an independent field channel from the main canal in order to avoid conflicts among villages.

Resource mobilisation: The basis of resource mobilisation differs from system to system, but defines obligations, resource mobilisation strategies, water rights questions and membership within the system.

Community resource: In FMIS, the ownership of water rest collectively with the group and the acquisition of water is a community effort. Hence, the community as a whole determines the principles of water allocation and distribution to individual farmers. Any individual who violates the principles is subject to a penalty determined by the community.

Allocation and distribution: Allocating and distributing water is an important task of any irrigators' organisation.

FMIS AT A CROSSROAD

Despite the fact that FMIS have evolved historically into an accepted arrangement for governing an irrigation system, they are at a crossroads. They face many challenges, include design, depletion of locally available construction materials and competition over the use of water. Referring to the Sorha Chattis Mauja irrigation system, Gyawali and Dixit (1999) suggests that 'traditional systems face difficulty mobilising labour due to the economic, political and social changes currently facing the region'.[1] Some of the emerging constraints that FMIS face are as follows:

Construction and repairs: Irrigation systems need regular repair and maintenance. In most FMIS, forest products are used to divert water. With forest resources becoming less available farmers have to depend on imported materials like gabion wire, cement and reinforcement steel bars. The dependence of FMIS on external resources and government programs has decreased their resilience.

Assistance to FMIS: Financial assistance through loans and donations are channelled to FMIS using governmental channels. Many times support is in kind: gabion wire and cement. The implication of this routings is that once autonomous systems have become increasingly dependent on governmental resources. Dependence on external resources has brought about a concomitant decrease in the initiative of local communities, who show less interest in managing water. External input has also led to the introduction of different technologies. According to Horst (2001) many technologies in AMIS have failed to deliver. The use of similar technologies in FMISs, is a recipe for systemic dysfunction.

Competitive use of water: A new challenge is posed by new legislation that ignores to the existence of FMIS. The development of hydropower by the private sector increases competition for water. Through licensing a prospective developer claims river sites for hydropower generation. As a result, water is diverted from existing FMIS. The absence of a mechanism to resolve disputes which surface between two users, traditionally, irrigation and drinking water users exacerbates the problem.

Subsistence economy: Another challenge is presented by the economy. Political uncertainty, Maoist violence and global events have compounded the problem of an already stagnant agriculture base. Able bodied youths from rural areas have migrated to urban centres and other countries in search of employment. Because the maintenance of FMIS is a labour-intensive task, without the muscle power of young men, the tasks of repair and maintenance have been neglected in many systems.

Introduction of a centralised water control system: A number of legal instruments promulgated in the recent past have long-term implications for community-based natural resource management practices. One such measure is the Water Resource Act of 1992, which specifies that water belongs to the state and that, therefore, its uses are to be permitted or licensed by the government. The legal provision has transferred ownership of the resource to the state. Water User Associations (WUAs) get legal status and recognition according to the act, which also makes provisions for the establishment of District Water Resources Committees. Many FMISs have been brought under the rubric of centralised and external management. When systems are selected for rehabilitation or when government resources are sought such groups get preference. FMIS which are not registered with the district and a large number of schemes fall into this category get less priority. Inadvertently the rehabilitation program has created two types of FMIS systems recognised by the government through the so-called legal WUAs and systems without legally recognised WUAs.

Legislative provisions: Just as the Water Resources Act of 1992 has made water resources state property, the Local Government Act of 1999 has made the provision that local irrigation systems are to be managed by Village Development Committees. User groups have only a superficial existence under this provision. The Irrigation Regulations of 1999 state that WUAs will be registered in the District Irrigation Offices (DIO) of the Department of Irrigation (DoI). It mentions that the DIO, with the approval of the DoI, can dismiss or suspend any WUA. This regulation promotes the establishment of officer-centered WUAs which are not conducive to community resource management activities because they can act only as extensions of the department. This provision directly interferes with the concepts of a polycentric society and of community resource management at the grassroot level.

Farmers Federation: In 1998, the National Federation of Water User Associations was formed. The federation faces many challenges. One challenge is identifying members to be included in the federation. At present, only the so-called legally recognised WUAs can become members. Consequently, a large numbers of WUAs of FMIS remain outside of the umbrella of the federation and hence outside of the bargaining power that the federation can provide. Thus, the Federation of the Water Users Association represents only a small section of WUAs. Ideally, though, federation should interact with state agencies and donors to promote natural resource management and advocate farmer friendly policy and programs free of partisan political influence.

CONCLUSION

FMIS in Nepal have sustained and survived the test of time. Many farmer-based groups are being asked to register formally with the administrative structure stipulated by the new legislation. Water has fallen under centralised and state control through statutory policy and legal instruments. This has led to a rise in irrigation bureaucracy but has not really helped to improve water management. This is not a unique situation. In Tamil Nadu, for example, according to Sengupta (1997), 'ascendancy of bureaucracy has not always brought about desirable changes in the management of irrigation system.' Along with its propensity for centralisation the government also promotes WUAs and transfers management responsibility to farmers under its management transfer program. The question of sustainability and governance of irrigation systems hinges between these two responses. At another level, in many places communities struggle to maintain their rights to water, customary practices and livelihoods.

This is a specific challenge for FMIS but also represents a larger challenge to the process of governance itself. The primary objective of good governance is to sustain institutions so that they continue to perform according to their designs. In this effort, the size and influence of the irrigation bureaucracy has expanded significantly but has not yet ushered in conditions of good governance in water management. In fact, the notion of good governance has itself been compromised. The challenge is to ensure that FMIS becomes sustainabile institution that promote polycentrism and good governance.

NOTES

[1] In many irrigation systems, farmers are showing less interest in the collective activities of management due to erosion of social capital and an increase in market-oriented individualism. They show little interest in cleaning canals or in erecting the new diversions needed to keep water running in the canal systems. This apathy introduces new challenges to management (Dixit, 2002).

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THE EFFICACY OF USER COMMITTEES IN THE SUSTAINABLE MANAGEMENT OF MICRO-DRINKING WATER SYSTEMS

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ABSTRACT

National water resources are common property resources. Besides the state, the community also has a right to harness, conserve and use the water resources within its geographical boundaries without adversely affecting the neighbourhood. The rights of user communities must be well defined in order to make the communities judicious, accountable and efficient in matters of water management in general and in drinking water in particular. People's movements such as the *Pani Panchayats* in Maharashtra, the Sukhomajari project in Haryana, the rainwater harvesting interventions of Anna Hazare in Maharashtra and Rajender Singh's Water Parliaments in Rajasthan are illustrative of the spirit of the collective rights and responsibilities of communities with regard to the management of water resources for irrigation as well as for drinking. Treating water as a common good is the route to sustainability in water use and democratic control for ensuring water rights for all. Privatisation is not the answer to the water crisis because it strengthens the not-so-positive ecological and political processes which have brought it about. While the concept of commons is based on the inalienability of shared rights derived from use, privatisation is based on the tradability of private property (Shiva, 2000). The paper highlights the lessons drawn from an Indian field study on community-based initiatives in governance, rights to water, conservation, augmentation and management, which are part of a partnership between communities and NGOs in ensuring the equitable distribution and quality control of drinking water. When it was discovered that excess fluoride in the drinking water was a major problem in Mehsana District of Gujarat, India, the local community of the village Meta in cooperation with an NGO embarked upon an innovative community-based intervention to install a mini defluoridation-based drinking water plant. A system of augmenting and rationing quality of drinking water for all was evolved with the aim of conserving drinking water as well as pricing it in such a manner that the water users themselves pay for the operation and maintenance of the plant. The focus was on community capacity building and sustainability. The paper also highlights critical matters related to institutional governance and the limitations of state run rural water supply systems. Pricing alone will not be a sustainable solution and attention needs to be paid to community rights to water as well as to their ability to pay for it.

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INTRODUCTION

A field study was conducted to find out about and analyse aspects of drinking water quality, equality, pricing and governance in Meta and Methan villages of Sidhpur Taluka, Mehsana District, Gujarat, India. Participatory Rural Appraisal (PRA) and Participatory Learning and Action (PLA) methods were used to collect information and appreciate the people's perceptions, decision-making and actions. In particular, Observation and Focus Group Discussions (FGD) comprised the core of the field enquiry. FGDs with users, user committees, Gram Panchayats (local self – government bodies), state government officials of the Water Supply Department and NGO project staff, constituted the other methods of study.

A sample of 30 drinking water user committee members and 12 key informants involved in the management of the mini deflouridation plant was interviewed. The Focus Group Discussions involved 40 users and representatives of the Muniwar Abad Charitable Trust (MACT), the Meta User Committee (the project partner), the local *Panchayats* and officials at the State Rural Water Supply Department.

DRINKING WATER SCENARIO IN GUJARAT

Twenty-five districts, 30 *talukas* and 18,500 villages comprise the state of Gujarat. Seventy per cent of its population is rural. A major part of the state is dry and northern districts comprising the Saurashtra Region have been declared drought prone. Drinking water salinity, excess fluorides and nitrates comprise the core of the drinking water quality problem. Amreli, Mehsana and Rajkot districts constitute the focal areas for intensive Information, Education and Communication (IEC) campaigning in the state. The Rajiv Gandhi National Drinking Water Mission (RGNDWM) has short-listed these districts as part of its nationwide IEC campaigning in 65 pilot districts of the country.

The source of drinking water is predominantly groundwater. Amongst Gujarat's water quality problems, salinity ranks high as the state has 16,000 km of Coastline. While the problem of fluorides is acute in Mehsana and Amreli, Sabarkantha District is faced with a peculiar problem of high nitrates as is the case in Ahmedabad and Baroda districts, which are highly polluted mainly due to industrialisation and high fertilizer application. In fact, Sabarkantha District has recorded several cases of 'blue baby' disease – a disease caused by high nitrate content in water. Newborn babies are said to be born 'blue' because of nitrate pollution in drinking water passed by mothers. While the permissible limit of nitrates is 10 mg per litre, more than 45 mg has been recorded in several parts of Sabarkantha. The disease is technically known as Methamoglobinamia. It is compounded due to the presence of a high level of total dissolvable solids (TDS) and salinity. There are about 773 nitrate-affected villages and 1048 salinity affected villages in Gujarat. The

problem of excess fluorides (greater than 4 ppm), as in the villagers Meta and Mehtan, is severe in Mehsana and the rest of Saurashtra.

RESULTS AND DISCUSSION

Community based user management systems

The following is an analysis of the drinking water systems in the village of Methan, which uses a water supply system designed by the state. The lessons learnt from this village are compared with those from the neighbouring village of Meta, where the drinking water system is managed by community user group which focuses on the availability, accessibility and quality of water as well as equity, pricing and governance.

The problem of excess fluorides up to 4 ppm is one of the major drinking water quality problems in Mehsana. The inequitable distribution of quality water is another. The Rajiv Gandhi National Drinking Water Mission (RGNDWM) has short-listed 250 villages for locating defluoridation plants. Simultaneously, some NGOs and communities are also working to solve problem of excess fluorides. Even though there are nine laboratories in Gujarat and one laboratory in Mehsana, regular water quality surveillance and monitoring is not satisfactory. Consequently, the problems of excess fluorides and associated problems like fluorosis are daunting.

State interventions

The state runs many mega defluoridation plants under Gujarat Water Supply and Sewerage Board (GWSSB) on the principles of Nalgonda defluoridation 'fill-and-draw technique'. More often than not, these huge plants are dormant or operate with high costs and low efficiency. They ignore the principles and practices of equitable distribution and conservation.

One such plant was studied during fieldwork in Methan. The GWSSB has installed a 100,000 capacity mega defluoridation plant based on the Nalgonda technique. However, discussions with *panchayat* functionaries, people and local NGOs revealed that the plant was installed simply because funds were available under a GWSSB special scheme for fluoride control among other purposes. In other words, planning and people's participation was conspicuously absent. The village *panchayat*, too was apparently indifferent to the problems of the plant's maintenance and the future of the Gigantic Defluoridation Plant (GDFLP) is under a mega question mark. The *panchayat* pays a large sum for the maintenance of this plant. Additionally, the electricity bill to run the four-motor GDFLP amounts to Rs 18,000 – a month. By and large, all over the state it is the responsibility of the GDFLP installation contractor to operate and maintain each plant it installs for three years from the time of the plant's commissioning. When asked about the future of the

plant in Methan after the contractor maintenance period expires the *panchayat* the Sarpanch and the Secretary did not seem bothered. Its indifference is shown by its unwillingness to involve people in either the operation or maintenance of this plant. The people did not appear interested in taking any initiative to counter the impending closure of the plant mainly due to the mounting electricity bills. This plant had a bleak future as do many other plants all over the state, all of which are poorly maintained and, at times, exhibit counter-productive capacities.

GDFLP user charges

As regards to charging users for drinking water the GDFLPs of the kind outlined have not thought about the minimum tariff amount that needs to be collected from the people for operation and maintenance. Currently, a token of Rs 14 per annum per family is the people's contribution to the *panchayat*. Needless to add, this is a pittance when measured against the high operational costs. Although *Pani Panchayats* (water user committees) are expected to take care of aspects like people's participation, formation of user committees, collection of user charges, equitable distribution etc., nothing significant seems to have been done in this context in Mehsana. While agencies like UNICEF and MACT, Sidhpur, are working vigorously towards the provision of safe drinking water – an encouraging point that is elaborated in the following pages a lot of wastage of resources seem to be taking place wherever drinking water related activities were initiated by the GWSSB.

In the village of Methan, the GDFLP scarcely meets the needs of 8,000 people. Contrasting this with Mini-Defluoridation Plants (MDFLP), especially the one in Meta (50,000 litres/day), one will find that the opportunity costs of such huge plants are indeed very high. While the Methan plant serves only 8,000 people, the user committees of Meta and NGOs like MACT claim that instead of such gigantic plants, multiple MDFLPs of Rs 100,000 lakh each can serve the needs of 14 villages with similar population sizes with greater efficiency and effectiveness. Households in Methan pay a meagre Rs 50 per annum per family towards the cost of supplying piped drinking water through the GDFLP, while the poorer amongst them pay up to Rs 20 for water distributed through the stand posts in the village. Concomitant to the meagre and high meaningless user charges, is the problem of an enormous wastage of water due to its unlimited supply, at low water prices. Given the high operating and recurring costs of maintaining GDFLPs it does not make sense to build more of them in the state. What is required is a good conservation strategy and a meaningful system of pricing water so that villages like Methan will not only conserve water but also will be able to sell quality water to nearby villages which do not have the facility of de-fluoridated drinking water.

The Pani *Panchayat* or the drinking water user committees should also take initiative to organise people, augment and conserve water, and price it. It was reported that UNICEF

has helped in institutionalising about 60 Pani *Panchayats* in the district. Simultaneously, local *panchayats* are also reported to be making efforts to initiate the formation of user committees. Up to 19 user committees are said to have been formed in Rajkot and Mehsana districts. UNICEF, in particular, appears to have done significant work in the process of forming user committees and institutionalising them. UNICEF also provides 50 mm India Mark III hand pumps, for capacity building and supplying software components. Also, UNICEF believes that the creation of micro-watersheds and the establishment of a 'community convergent system' is the key to success.

Meta user committee interventions

The users groups of Meta and MACT have been making vigorous efforts to introduce watersheds and also to initiate schemes like recharging tubewells and constructing roof water harvesting systems. Tubewell-based pumps overhead tanks and standposts comprise the major components of their strategy to supply safe drinking water to villagers. In few villages where user committees and users showed high levels of initiative, piped water systems, too, have come up significantly. In all initiatives what is impressive and encouraging is the role of user committees in bringing new water supply systems and operations and maintenance practices to villages. However, action of this kind is very limited. In the majority of villages, including Methan, water supply systems are not only costly but also very ineffective and inefficient. With the attendant problems of low sustainability, these villages suffer from perennial shortages of quality drinking water. While community contributions and *panchayat* development fund contributions towards drinking water are significant in some places, by and large, villages either exhibit a total indifference to such systems or are served by inefficient systems in operation on behalf of the GWSSB.

The following section is an analysis of community-based user governance systems. The initiatives of the user committee of the village of Meta, not far away from the village of Methan, are highlighted. Here, the user community, in consultation and cooperation with the MACT and the local *panchayat*, has created a Water User Committee with an understanding that MACT will make the initial investment in the capital equipment a mini defluoridation plant (MDFLP) manufactured by Ion Exchange India Ltd. This MDFLP can process 50,000 litres of water per day. The current output, however, is just 25,000 litres a day owing to problems of chemical maturing. The plant will attain its full capacity shortly and would be able to deliver 50,000 litres a day. The MDFLP, fitted with an auto-chlorinator, operates quite efficiently and effectively, as is evidenced by field observations and discussions with Meta user committee office bearers and a sample of users. The MDFLP suppliers initially conducted some O and M on their own but with the understanding that the user committee will soon take over. The Meta user committee took over the MDFLP and its operation and maintenance within two months of its commissioning.

Water pricing

The Meta User Committee has evolved a system of user membership, water conservation, equal distribution and pricing of water in the village. From amongst its members, the committee selected a secretary-cum-treasurer, who is paid a consolidated salary of Rs 1, 500 per month. The committee has seven male and two women members. The *panchayat* representative is one of them. The committee charged a flat, one-time membership fee of Rs 100 per family towards the cost of MDFLP and its O and M. As far as the price of water is concerned, the committee charges Rs 30 per family per month for 20 litres of de-fluoridated water per day and Rs 15 per family per month for 10 litres of de-fluoridated water per day. In consideration of poorer members, who might find Rs 30 too high and smaller families with less need for water, Rs 15 pricing was evolved. It ensures that poor households can access de-fluoridated water at a price which assures them a regular supply. While the issue of equal rights and access has been well managed, the point of equal distribution has not been fully addressed mainly for reasons of availability, conservation and economics of scarce water in a region that faces recurring droughts and quality problems.

Field discussions in Meta revealed that almost every household (500 households) with a population of 3000 willingly pays the prescribed amount. Monitoring system of daily supply of stipulated amount of water to each household was interesting. People use jerry cans of 30 and 15 litres capacities to collect water. Every day the secretary monitors the amount of water taken by each family from (centralised) standposts, i.e., a maximum of either 30 or 15 litres of water per day per family. The number of jerry cans are matched with the number of families and a record is kept every day at the standpost in order to ensure that nobody collects water a second time on the same day. People are willing to pay for water; in fact the demand for good quality water, not withstanding the problems of equal distribution is great.

The user committee is confident that it will be able to fully repay the capital cost of the MDFLP shortly and that the committee will be able to continue to supply water consistently and to consolidate the existing O and M practices. Owing to the increased demand for good quality water, the committee is contemplating on either upgrading the present MDFLP or buying a new one with a higher capacity. A plant that could process up to 1 or 2 hundred thousand litres per day would meet the demands of the growing population including the migrant population within Meta and its neighbourhoods, with greater ease. It would also ensure equal distribution and assured quality.

As regards to the sustainability of the water source which feeds the MDFLP, there do not appear to be only problems as the deep tubewell as it is working efficiently. In fact, the tubewell was installed only after ensuring that there was enough water in the aquifer. While the committee has ensured that the present source is satisfactory, it is, however, still keenly pursuing a project of rainwater harvesting in the nearby micro-watershed so that the water captured and conserved will be able to recharge the MDFLP tubewell as

well as other sources of water in the village, including the open dug-wells. One such tubewell recharging system was seen in the vicinity of the MDFLP plant during our fieldwork. The aquifer is recharged by collecting water from intermittent and regular monsoon rains in nearby pools. The water collected is absorbed by the RTW and injected into the ground so that run off is minimised and water is retained underground. Thus, the aquifers are replenished periodically so that the groundwater supply in the vicinity of the MDFLP and distant villages is augmented.

While the problem of fluorides is, by and large taken care of by the MDFLP, other water borne contaminants, if any are effectively handled by the user committee through household remedies. For example, to treat turbid water, *chana* powder with drumstick seeds is used. Drinking water is mixed with these two components, stirred and filtered with cloth to remove the sediments. Drumstick seeds and tamarind are used as antidotes to the problems caused by excess fluorides in the region. Care is taken that vegetables are cooked in de-fluoridated water on oil, for seasoning with untreated water carries the risk of consuming sediments or even fluorides. To contain salinity, some treat water with jaggery.

IEC campaigns

A major part of the ability of the people to appreciate the health problems of excess fluorides in drinking water is attributable to the information and education campaigns carried out periodically by the user committee and MACT. MACT simultaneously works on school health and sanitation camps so that children, who are quick learners, go back to their homes and share knowledge and information on drinking water with their parents and siblings, especially illiterate ones. Users in Meta have learned ways to conserve water. In addition, hardly any member defaults in paying what is due to the committee. This is in direct contrast to the observed behaviour of drinking water users in the village of Methan, where people excessively waste the unlimited supply of water they get from the village overhead tank that purportedly provides de-fluoridated water.

An important lesson is that the pricing of water should be preceded by a limit on the use of water, even if that limit is artificial. Limiting ensures supply of water available so that people learn to conserve water and willingly pay for. Pricing, however, should be progressive and not regressive. In Meta, it is not fully progressive, nor is it regressive. The availability constraint itself puts a premium on the conservation of drinking water, whereas an abundance of water, as in Methan, for example, can be a disincentive for conservation as it may lead to avoidable wastage.

A rudimentary and quick method of calculating the cost recovery of MDFLP and its operating and recurring expenses is worked out below. It illustrates during discussions and especially in the context of training programmes how project costing works. The calculation is shown is table 1.

TABLE 1
PERCENTAGE DISTRIBUTION OF RESPONDENTS BY SEX, AWARENESS LEVEL/OPINION ABOUT REFORMS AT SIRAJWAH DISTRIBUTARY

Details	Cost in Rs
MDFLP (initially invested by MACT)	75,000
Installation and standpost sub-systems (initially the community elders made contributions)	25,000
Inputs including chlorine, alum and electricity per month	300
Salary to operator-cum-committee secretary per month	1,500
Three-fourths of the household's pay per month for 15 litres of (MDFLP water) a day	30
One-fourth of household's pay Rs 15 per month for 10 litres a day	1,875

Environmental sanitation

As far as the linkage between drinking water and sanitation is concerned, it appears that the Meta user committee, in cooperation with MACT, has a long way to go in addressing the problems of sanitation and in integrating the same with drinking water projects. Sanitation, understood in terms of sanitary toilets, is a weak link in the project. Significant efforts need to be made to improve sanitation. Another related aspect of drinking water is environmental and household hygiene. In this context, the Meta User Committee and the MACT are doing quite well. They have provided common washing *ghats* for women to wash clothes in a central place with clean but untreated water. This arrangement for a separate water tank for cloth washing is a good intervention both to keep the environment clean and to conserve treated drinking water. Women seemed happy and added that the *ghats* help them keep their own households clean as they get to wash their clothes in a central place with a regulated supply of water at three-hourly intervals. Furthermore, several women commended the overall efforts of the user committee as it saved time, earned a higher income, improved health and reduced drudgery in the last two years since the project was first implemented in 1998-99.

While these are some positive changes, the unhygienic physical environment around the washing *ghats* is disturbing. These areas are dumping grounds for garbage because they provide a good enclosure. G*hat* users, who do not consume this water argue that 'this garbage may not harm people' but it is not a tenable argument because maintaining cleanliness is one of the integral components of environmental sanitation. Washing *ghats* should not be exempted from cleanliness. One of the reasons the people of Meta use them as dumping grounds is that they are located at the outskirts of the village. By locating such *ghats* in the middle of villages future interventions may avoid this problem. The places would be kept clean and would be more secure for women.

The Meta User Committee and MACT are keen to introduce a project to recycle waste under a waste management programme in late 2001. It would be instructive for the project officers of MACT and the user committee members to take a clue from the Hyderabad Municipal Corporation's experiment wherein Self-Help Groups (SHGs) of women clear garbage. The same women take the garbage to dumping yards-cum-waste product recycling units on the outskirts of the city. The waste is separated into biodegradable and non-biodegradable waste, and the biodegradable waste is converted into pellets, which make highly efficient and cost-effective fuel. Thus, the SHGs not only help the Corporation keep the environment clean but also generate income for themselves: wages for clearing garbage and profits from selling waste product-based fuel pellets.

ACCESS AND EQUITY INTERVENTIONS

The following section discusses the blossoming of positive effects of the Meta Project. In Samoda, a neighbouring village contiguous with the Meta *revenue* cluster village there was no problem of environmental sanitation, but water distribution to low-lying areas within the village was difficult. In response Meta User Committee and MACT initiated an imaginative action plan to ensure that water was equally distributed to all areas of the village both at high and low altitudes. Also, the MACT engineers, in collaboration with the Water User Committee, were able to create a system through which water could be distributed to both low and high lying areas at the same time in case one of the area-specific water distribution systems was out of order, however temporarily. Special levers are used to regulate water pressure and flow direction. In a similar case in another neighbouring village, the Meta User Committee and MACT had solved a complex problem of inequitable distribution of water by fixing a 'horse hump' for equitable water distribution. This was achieved by making a small one-time investment of only Rs 2500.

In Tavadia, which borders neighbouring Meta one sees a classical illustration of the wrong priorities of the government and the consequent failure of protected water supply systems. In this village the GDFLP of the kind seen in Methan was operated without any rhyme or reason. The GDFLP had actually closed down for seven years and then was recently reopened at the behest of an important village political leader. The plant processes 25,000 litres of water though its capacity is twice as much. However, the state-paid-operators mixed treated water with untreated water in the process of distribution, which means that the treatment is unworthy. Mixing occurs because there is no separate piped water system to provide de-fluoridated water to the people directly. The MACT field team members reported that they tried in vain to convince the people of Tavadia that they need separate sources for drinking water and water for other purposes, that they appeared indifferent when the problem was discussed with them. This is a serious problem to be

taken note of by both the GWSSB and MACT. Even though successful examples exist in nearby villages like Meta, the IEC campaigns have not reached the villages of Tavadia and Methan. Ironically, both villages are located within a radius of 10-15 km from the offices of Meta and MACT.

MANAGEMENT LESSONS/RECOMMENDATIONS

The major management lessons that can be drawn and the recommendations made from the foregoing observations and analysis include the following:

1. People's participation, especially the formation of user committees for activities like the provision of safe drinking water, is vital. What stands out in the end analysis is the strength of user groups and their ability to manage any given activity related to the introduction, operation and maintenance of drinking water and sanitation programmes. Equally important are the quality and extent of the demands made by user groups on the delivery system. This demand assumes greater significance when the delivery system is managed by the user groups themselves. The quality of user demand and the water quality monitoring seen in Meta and Sammoda villages is illustrative.
2. Participatory planning of micro-water systems is essential for the sustainability of locally based and managed drinking water systems. An important feature of the systems observed in villages like Meta is that the drinking water system has been integrated either with a micro-watershed or with a recharged tubewell/percolation tank.
3. While the augmentation of water supply is critical, the strategy needs to be dovetailed with water conservation practices. In Methan, state interventions were well intentioned but wrongly conceived. The drinking water system was built before an effective user group was formed. Because the supply of water was unlimited, conservation was not effectively adopted. In Meta, in contrast, conservation and near equal distribution strategies were conspicuously built into the user managed MDFLP system right from day one. Poor planning, unresponsive users and an unlimited supply of water mean that wastage was high, this occurs at the cost of both quantity and quality.
4. Standpost drinking water systems promote the conservation of water more than to pipe drinking water systems do. The costs of piped water supply systems are prohibitive, too.
5. A governance arrangement that ensures 'rights to water' with equal access distribution through user charges, as in the case of the village of Meta, is key to the successful management of water supply systems at the micro-level. Such arrangements can be sustained over time. User charges not only impose discipline on users, but they also encourage conservation and (near) equal distribution practices. However, it should be noted that user charges should not become a burden on people, especially the poor and those who conserve water meticulously. Therefore, the pricing of water should be

progressive and not regressive. The user charges in Meta were neither progressive nor regressive but were just about okay. The potential to build up progressive water pricing and equal distribution system over time exists.

6. The augmentation and conservation of water should be given top priority. Equitable distribution of water must be ensured. Simple interventions such as those in Sammoda should be replicated. With the simple intervention of a 'horse hump', equitable distribution of water was ensured at the cost of a small one-time investment. Here greater priority was also accorded to the weaker sections of Sammoda by giving them equal access to drinking water through small interventions like an additional tank for those living in the upland or tail-end part of the village.
7. Mistakes made in Methan should be avoided by making sure that micro-interventions are managed by user groups. Micro-systems make sense in dry areas, where water tables are already dangerously low. This lesson is crucial in the wake of the droughts that face many parts of Gujarat and other parts of the country.
8. Interventions by NGOs like MACT must end through a conspicuous 'exit policy'. Subsequent to their departure, user committees should manage their own affairs.
9. Groundwater based (tubewell) drinking systems are to a large extent, influenced by water withdrawn for groundwater irrigation. Therefore, the functional integration of irrigation water systems with drinking water systems is imperative. In this context, the following summary of the irrigation scenario in Mehsana is highlighted, as are its implications for groundwater based drinking water systems elsewhere:

   (a) There has been a change in the regional water management scenario since 1982, when a dam was constructed at Mukteswar, upstream from Sidhpur on river Saraswati. Thereafter, the perennial flow of the river disappeared totally. The seasonal flow that was sustained one or two months after the monsoon also disappeared. This was the cause for a dramatic departure from the dug-well based water supply systems to the use of deep borewells. Groundwater irrigation was adopted by farmers as a functional strategy to counter the fluctuating rainfall situations and boost agricultural growth. There is a growing clamour and demand for water not withstanding the fact that the rainfall situation has generally been unfavourable and groundwater levels declining. The clamour is, by and large, caused due to a combined effect of:

   - An increase in crop intensity and area of water intensive crops
   - General encouragement provided to farmers for commercial agriculture by promoting groundwater technologies, facilitating bank loans, etc.
   - Ecological changes due to the construction of the Mukteswar Dam

b) Some dormant tubewells have not dried up in absolute terms: it is the pumps not the wells, that run dry. Yet, farmers frequently lower the level to gain higher efficiency of water withdrawal. Then they drill a new deeper tubewell in order to install a higher capacity pump without carrying a pump efficiency test. Thus, the choice of the level and the capacity of the pump are never made on the basis of a water 'steady-state' equation.

10. Points 1 to 9, including (a) and (b), summarise the adverse impact that the overexploitation of groundwater has on the right to and on its availability, accessibility, equality and quality of water. Drinking water is particularly badly hit.
11. The practice of water harvesting by way of constructing a village *talab* (reservoir or pond) should be encouraged at local levels to ensure drinking water promotion and conservation. These talab should be similar to the summer water storage tanks of the *Sri Sathya Sai* Drinking Water Project in Ananthapur, India. However, the bottom of *talabs* should be treated to arrest infiltration. Also, non-harmful anti-evaporation chemicals should be used.
12. A strong opinion in favour of artificial groundwater recharge prevails though our study suggest the possibility that efforts forward implementing such ventures will be futile owing to the fact that rainfall is low. Proposals for artificial groundwater recharge should be scrutinised on the basis of site-specific and cost-benefit factors. Rainwater harvesting systems must be promoted at the household and community level as this technology can augment drinking water availability as well as improve its quality.
13. Governance systems and mini-deflouridation plants like the one in Meta should be replicated in other dry parts of the region.
14. The existing inefficient, high-cost and counter-productive mega deflouridation plants like the one in Methan should be closed and alternative arrangements made.
15. A rational pricing policy for levying user charges on villagers who access drinking water supplied through state or *panchayat* rural water supply systems needs to be formulated.
16. User groups, activists and state agencies should help farmers as well as drinking water users to ascertain water tables, water yields and recharge levels so that indiscriminate sinking and deepening of borewells is controlled. As piped water supply systems, especially house connections, go against the principles of water conservation and equal distribution, greater emphasis should be laid on initiating centralised water vending points the street taps. The Meta (MDFLP) experience should act as a guide.
17. The state/panchayat authorities should develop a policy for regulating the minimum distance between borewells and their depths, as well as for monitoring the status of the present borewells.
18. An illustrative chapter on safe drinking water and its conservation and promotion should be introduced in the school curricula so that school children appreciate the problems of the current water scenario and prepare themselves for a better, safe water-based future.

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WATER RESOURCES IN NIGERIA: RIGHTS, ACCESSIBILITY, ALLOCATION AND MANAGEMENT

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ABSTRACT

The UN Administrative Committee for Co-ordination (UACC) task force on social services states that: 'at the highest political level there needs to be recognition that water and sanitation are basic needs and rights.' Similarly, the ministerial declaration of the Hague Conference on Water Security (March 17-22, 2000) also states that water is vital for the life and health of people. We have one goal, it claimed, 'ensuring that every person has asses to enough water'. Despite such statements, the right of Nigerian people to access to safe water has been persistently violated. Water resources are grossly mismanaged and unequally distributed despite the return of democracy to the country. Local people (especially women, who bear the greater burden of the water crisis) are invariably excluded from decision-making processes involving their water resources. The highly flawed constitution of the Federal Republic of Nigeria, 1999, puts the management and control of water resources beyond the reach of ethnic nationalities and peoples that makes it the exclusive preserve of the federal government of Nigeria. Legislation stipulating how water resources should be managed exists, but it is almost always ignored. This paper uses field analyse, reports and interviews from the oil-rich Niger Delta region as case studies outlining the multifarious problems that bedevil the country as a result of poor water management. The Niger Delta, the most threatened ecosystem in the world, has been degraded by oil multinationals like Shell, Chevron and Mobil. Wetlands and mangroves universally recognised as fragile ecosystems are under stress due to waterlogging and oil pollution. Nigeria recorded 400 oil spills in the first nine months of 2000; these rendered fresh water sources highly polluted. The paper also examines the struggle for self-determination headed by the Movement for the Survival of Ogoni People (MOSOP). It considers sustainable water resource management and fights over resource control between the federal government and the highly impoverished, pauperised and marginalised ethnic nationalities who have organised social movements in the country. It highlights the implications of this situation not only for Nigeria but also for the entire world. Finally, the paper recommends for practical ways of bridging the gap between the government and the people of Nigeria, restoring the people's right to access to the quantity and quality of water they need, ensuring the equitable allocation of water resources among the Nigerian peoples, and providing for the sustainable management of water resources in the country.

INTRODUCTION

'Global water resource crisis' a commonly re-echoing phrase has until recently been viewed by much of the world as a strategy used by environmental activists to create the fear of catastrophe in the nations and people of the world. Only recently it has begun to dawn on the governments of different nations with rapid population growth, increasing rates of consumption and pollution may, in fact, lead to a huge water crisis.

Apart from air, water is the most important resource to human beings. They can survive longer without food but cannot survive without water. Human beings require water for cooking, drinking, washing, general sanitation, agriculture and manufacturing processes. But because water is freely available through rainfall, they have, until fairly recently, taken this unique resource for granted. Although 70 per cent of the earth's surface is water, it has become a scarce commodity in many areas. Poor management has created scarcity even in countries like Nigeria that are well drained and blessed with abundant water resources. This situation violates our human right to water. The threat of a world water crisis is becoming increasingly real in the face of increasing demand, relatively static supply and deteriorating quality.

About 97.3 per cent of the world's 1.4 billion cubic km of water is ocean water which, without expensive treatment, is unfit for most human uses. Of the remaining 2.7 per cent of fresh water, more than 75 per cent is locked up in glaciers and polar ice. Furthermore, a sizable portion of fresh water is groundwater located hundreds of meters below the earth's surface. Only the water in rivers, lakes and swamps – which constitutes just 0.36 per cent of the world's fresh water supplies – is easily accessible to man and available for his use. Although man could alter the form and distribution of this usable water or improve its quality for better human use, the total amount available is fixed. The realisation of this fact and recent events of flood, droughts, water shortages and pollution in various parts of the world have underscored the need for proper management of the world's water resources. This paper attempts to take a lead on water resources development in Africa from the perspective of rights.

In Nigeria, economic development is concentrated in areas of high water accessibility and availability. In fact, water availability is a controlling factor for industrial and social economic development in Nigeria. Areas such as large portions of Bornu, Sokoto, Kwara, and Gongola states, where water supply is unreliable are invariably sparsely populated. Industrial, social and economic development of the country is only felt in urban centres where people have relatively reliable access to water. Hence, since water is a propelling factor in the development of all facets of life, the violation of Nigerian people's right to water is depriving them of their right to social and economic development. I feel completely free to state that this is against the provision of the constitution of Nigeria, 1999.

WATER RESOURCES OF NIGERIA

Nigeria with a population of over 110.5 million and a growth rate of 3.051 per cent is the most populated country in Africa. It has a land area of 910,770 km^2. It is blessed with abundant water and other natural resources such as crude oil and other minerals. Since attaining independence in 1960, however, the local people have suffered acute water resource management problems. This poor management has, in recent times, caused a series of community outcries. Communities are struggling for their fundamental right to water and control of resources because the government has failed in its constitutional responsibility to provide water and a decent environment. The government has always responded to their appeals with brutality and with further violations of community rights. People have been massacred. The killing of Ken Saro Wiwa and eight other eminent Ogoni personalities in 1994, under the military government of Sani Abacha, is one case that drew global attention. The Odi community of Bayelsa State has also been hit by federal government sponsored terror and massacres even under the democratic government of Olusegun Obasanjo. The entire Odi community was completely wiped out because they cried for their right to water and other resources, which were being exploited, polluted and mismanaged. Now the battle is becoming even more intense as the government is more determined than ever to control national resources without considering the rights of the people.

Let us consider the different kinds of water resources present in Nigeria and some of the more specific issues relating to their management. According to Ekpo (1990), two common sources of water supply are available in Nigeria: surface and groundwater.

SURFACE WATER

Surface water in Nigeria is readily available through springs, streams, lakes and ponds. It is estimated that the quantity of surface water in lakes, rivers and streams is another 2×105 km^3, while about 6×10^6 km^3 of ground water exists between the ground surface and a depth of 50 m. Additionally 2×10^6 km^3 may be available at greater depth (IRC, 1981).

Surface water in most areas is contaminated, but in spite of this most Nigerians depend on the surface water supply. In rural areas, people travel long distances to fetch water. The provision of piped water in Nigeria to both rural areas and urban centres depends on direct pumping from streams whose perennial flows are sufficient to meet needs and on building dams and reservoirs where the natural river flow cannot satisfy abstraction requirements all the year round. The supply of piped water is still restricted to a few urban centres, but even where modern piped water has been provided, a persistent shortage is usually the rule. This is because most projects lack adequate data on sources and demands and planning is weak. Nearly all surface water projects are based on data collected over a short period. This is far

from adequate as no account of long-term factors such as changes in climate which directly affect river flow regimes and sedimentation is made (Ekpo, 1990).

GROUNDWATER

Apart from surface water – which is readily available in Nigeria – groundwater is another main source of water supply. Groundwater can be viewed as a mineral resource that is renewable if it is properly managed. It serves as an important resource in all the climate zones of Nigeria from the arid regions of the north to the wet humid parts of the south. Knowledge of the quantity and pattern of distribution of Nigeria's groundwater resources is still far from satisfactory. Available data indicates that the country, though rich in surface water resources is comparatively deficient in groundwater resources. There is however, no accurate data on quantity of groundwater in Nigeria. No attempt has been made to estimate the magnitude of groundwater resources (Mitchell-Thome, 1961). Only a broad classification is available, categories groundwater occurrence into 12 provinces, which constitutes groundwater management units. These are as follows:

1. Coastal alluvium mangrove and freshwater swamps
2. River course alluvium
3. Coastal sedimentary lowland
4. Chad basin (confined aquifer)
5. Kerri-kerri sandstone
6. Sokoto basin (tertiary)
7. Sokoto basin (cretaceous)
8. Anambra basin
9. Cross river basin
10. Benue basin
11. Crystalline area

According to Ekpo (1990), these provinces can be harmonised with eight hydrological areas, each of which is hydrologically delineated and represents a catchment area or river basin where information such as rainfall, run-off, evapo-transpiration, infiltration and groundwater recharge can be quantified. Most Nigerian basins have multiple aquifer systems. In the sedimentary environments, aquifers occur on a regional scale with extensive groundwater flows (Offdile, 1988). In basement complex crystalline rock formations, however, aquifers occur only in isolated basins and reservoirs.

Preliminary estimates put the groundwater stock in Nigeria at about 9500 billion litres. Nigeria, which occupies an estimated 0.7 per cent of the total world land area, has a

TABLE1
WATER YIELDS FROM BOREHOLES LOCATED IN DIFFERENT ROCK FORMATIONS IN NIGERIA

Geological formation	Location of borehole	State	Depth of borehole (m)	Static water level (m)	Yield 1/hr
Abeokuta	Ota	Ogun	53.0	9.4	22730
Sand+	Abor	Delta	64.0	18.2	40.914
Alluvium	Epe	Lagos	72.6	15.8	55006
Basement*	Illorin	Kwara	28.8	3.9	16275
Basement*	Dambanki	Kano	76.1	36.5	3364
Basement*	Maigamoka	Kano	77.7	37.0	31858

*basement complex; + indicate coastal plains

groundwater supply that amounts to only 0.2 per cent of the world's groundwater total. The comparative deficiency of groundwater in Nigeria vis-à-vis surface water has been attributed to the fact that over half of the country is underlain by hard crystalline rocks of the basement complex rocks mostly of igneous and metamorphic origin (see table 1).

RIGHTS, ACCESSIBILITY, ALLOCATION AND MANAGEMENT

Despite the abundance of water in Nigeria, potable water is far from meeting the needs of the masses. At the same time, most people even those in rural areas, are becoming aware of their right to good quality potable water. In Nigeria, water resource accessibility is fully controlled by the government. Only small proportions of Nigerians have access to water for domestic and industrial use. Demands for food, housing and other human needs have increased greatly with the increasing standards of living and purchasing power. The increased productive activities generated by these demands have had a tremendous impact on the need for water. The impact of this increase in demand is most intense in urban centres, where the concentration of population and economic activities is greatest.

In Nigeria, virtually all improved water supply (i.e. treated water or untreated water from boreholes) for domestic needs is obtained from public water supplies. Supplementary supplies almost invariably come from doubtful surface sources and uncased or shallow wells. The bulk of water supply for small and intermediate industrial and commercial establishments is also obtained from public water supplies. These are usually metered and consumers are charged at rates that vary from state to state. Large industrial and commercial establishments and, in some cases private individuals have, however, discovered that public water supplies cannot meet their water demands. Most of them have, as a result, developed their own sources, usually boreholes. In Lagos, one of the most populated states of Nigeria, for instance, where the annual rate of increase in industrial water demand is about 75 per cent larger firms obtain less than 15 to 17 per cent of their water need from state public water supply

systems. Similarly, many hospitals, schools and other public institutions have their own sources, particularly when the communities in which they are located have no public water supplies (Ayoade and Oyebande, 1990).

In rural areas, the main water needs are for domestic and agricultural purposes (for livestock and crops). In about 90 per cent of the rural communities, the sources of water supply for domestic use are unimproved. Many people have spoken vociferously against the long standing social injustice of spending large sums of tax payer's money to cater to the small proportion of the population living in towns at the expense of the masses who live in rural areas without clean, potable and dependable water supplies (Oyebande, 1975). Water shortages in Nigeria's rural areas, and even in its urban centres, cause real hardship. In rural and urban areas, many man-days are wasted each year in looking for water and hauling it over great distances (Ayoade and Oyebande, 1990).

Statistical research has demonstrated that water supplies are inadequate in every state of the country. The total output of public water supplies in Nigeria stood a little above 948 million litres per day (MLD) in the early 1980s. Since then, the conditions of public water supply have not improved much. Private supplies add about 47 MLD to make a total water supply of about 995 MLD for all uses. Include the demand on MLD for comparison less than 27 per cent of the over 110 million Nigerians have access to improved water supply at present. The pattern of water supply varies from one state to another in Nigeria. In some states, less than five per cent of total population has access to improved water supplies while very few states record a little better situation. The pattern seems to reveal different approaches to the allocation of water supply schemes too. In most southern states, particularly Lagos, Ondo, Abuja and Anambra, investment in water supply is spread over a large number of towns and satellite villages, in consequence a fairly large proportion of the state population is served by public water supplies. On the other hand, some states concentrate their water investments only on a few large towns and neglect the large proportion of people living in smaller towns and villages.

In areas served by improved water supply, the per capita availability varies from 10 to 127 litres per day. The average of 46 litres for the whole country is much below the generally accepted minimum of 115 litres for relatively cool countries. Since 1960, funding allocated by the federal government of Nigeria for water resource development has increased substantially. This huge financial outlying however, had little impact on the provision of water supply to ordinary citizens. Human rights activists across the country have unanimously attributed this to the high levels of corruption and mismanagement in water institutions at the levels of both federal and state government. There have been a series of causes, such as the Oruokosa community borehole project in Edo State, where the government has pretended to hear the appeal of local

communities by developing and commissioning borehole projects but has failed to implement them effectively.

In Nigeria, the inadequate supply of water is a constraint on the expansion of existing industries and on the location of new ones. The cost of food in Nigeria is also increasing. The food situation in the country calls for the full mobilisation of the country's land and water resources to increase agricultural output. The inadequate supply of water is the major constraint on increased agricultural production in the country today. Since development and water are interlocked, any improvement in people's right to water will effectively enhance the development of other areas of human rights. The government is mandated to provide its people with the right to water under the constitution of Nigeria, 1999. This document requires that the government manage and harness the material (natural) resources of the nation and distribute them as best as possible in order to serve the common good of the people especially in the areas of social and economic development.

Nigeria must evolve a national water policy to guide the planning, development and utilisation of her vast water resources. We need to know the nature and magnitude of the country's potential water resources; future domestic, industrial and agricultural water requirements, and how these requirements can best be met. Nigeria will probably not achieve these goals under the present administrative arrangements, where in the states pursue different water development and pricing policies through various water boards and corporations. Although Nigeria has a Federal Ministry of Water Resources with the mandate to take responsibility for irrigation and dam development, as well as for the planning and control of water resource in the country, little have been achieved since the Ministry was established some decades ago.

In addition to the Federal Ministry of Water Resources, the federal government established by a decree 11 River Basin Development Authorities on 15 June, 1976. They are:

1. Sokoto Basin
2. Hadma-Jamande Basin
3. Lake Chad Basin
4. Upper Benue Basin
5. Cross Basin
6. Anambra-Imo Basin
7. Niger Basin
8. Ogun-Osun Basin
9. Benin Basin
10. Niger-Delta Basin
11. Lower Benue Basin

The River Basin Development Authorities are empowered to acquire land take over projects or lease land with the agreement of state governments as well as to exercise the following functions:

1. Undertake comprehensive development of groundwater resources for multi-purpose uses;
2. Undertake watershed management schemes for flood and erosion control;
3. Construct and maintain dams, dikes, wells, boreholes, irrigation and drainage systems;
4. Develop irrigation schemes for the production of crops and livestock;
5. Provide water from reservoirs, wells and boreholes for urban and rural water supply schemes;
6. Control pollution in rivers and lakes in the authority's areas in accordance with laid down standards, and
7. Resettle persons affected by the work and schemes specified in (3) and (4) above.

In addition to the River Basin Development Authorities, each State has a Water Board to complement the federal government agencies responsible for enhancing water supplies. Despite this, acute water problems affect all 36 states of the country. This has been attributed to poor institutional management and to the corrupt practices of the government officials mandated to manage these institutions.

The administrative framework for managing Nigeria's water resources has not been streamlined. Friction and duplication of efforts is common and there is little co-operation or co-ordination between the objectives of different organisations. There is also some overlap in the composition and functions of the River Basin Development Authorities and other national institutions mandated to manage water issues in the country. Such confusion stems from the fact that the relationship between the various State Water Boards and the River Basin Development Authorities has not been clarified. Nigeria needs to evolve an efficient and reliable organisational structure for managing its vast water resources.

An examination of poor water supply and management in Nigeria is not complete without examining the Niger Delta, one of the richest oil deltas in the world. The delta is located in the southern part of Nigeria and is primarily inhabited by minority communities. Data collated from organisation involved in health indicates that in the Delta only 20 to 24 per cent of rural communities and 45 to 50 per cent of urban communities have access to safe drinking water. These figures are probably optimistic since none of the public water supply systems is treated, pipes are often broken and chronic shortage of electricity greatly reduces operation. In the first nine months of the year 2000, Nigeria recorded more that 400 oil spills rendering freshwater sources in the Delta highly polluted. In an extensive

study of water quality throughout Rivers State, researchers found that over five per cent of the samples contained total colliform counts at levels indicating fecal contamination. *Eschericha coli biotype* 1, *Streptococcus feacalis,* and *Clostridium perfringens* were found in over 75 per cent of the samples. The presence of high levels of fecal indicator bacteria spread over such a wide area in the Niger Delta illustrates how widespread problems of water contamination are in the region.

The Niger Delta, the most threatened ecosystem in the world, has been degraded by activities of multinational oil companies such as Shell, Chevron and Mobil among others, with a recklessness unequaled anywhere else in the world. Within the last decade the degradation of the Delta has become a focus for community resistance and struggle for self-determination spearheaded by the Movement for the Survival of Ogoni People (MOSOP). The Ogoni struggle has been internationally recognised as a special case in the struggle of a minority group for recognition in the face of corrupt and self-centered government officials. The leader of MOSOP and eight other member were killed by the Abacha military junta in 1994 when the movement was advocating the democratisation of oil and water resources in the Niger Delta and the consideration of the minorities in decision making concerning issues that affect them.

In Nigeria, potable water is completely beyond the reach of the common man. This is because the Water Boards of most states in Nigeria have failed to fulfil their responsibilities. Energy and corruption are widely recognised as one of the greatest obstacles to proper water management in most states in the country. A case study of the activities of the Edo State Urban Water Board reflects problems common to all water management authorities across the country.

A CASE STUDY OF EDO STATE URBAN WATER BOARD

The Edo State Urban Water Board was established about two decades ago. It was mandated to provide potable water for the people of Edo State. The Board tries to achieve this mandate through two schemes focusing, respectively, on the development of underground and of surface water.

Where surface water development is concerned, the Edo State Urban Water Board has developed two dams – the Ojirami Dam in Akoko-Edo and the Ikpoba River Dam in Benin City. The latter was commissioned on 9th October, 1987. The State Water Board, like every other water institutions in Nigeria, faces a variety of management and financial problems, which the board identifies as major factors undermining their performance. The Board, whose present coverage is mainly the major towns like Benin, Auchi and Uromi, has little or no plan to extend services to rural communities. Because of this, rural underprivileged and minority communities are completely neglected with respect to state

government water supply services. Furthermore, the State Urban Water Board can only supply 50,000 litres/day as against the target of 120,000 litres per day. For a region with a population of over five million, this means that, water shortages are endemic.

With the population in Edo increasing the struggle for potable water has increased tremendously. Only half of Benin City is covered by the State Urban Water Board's supply lines and less than one fifth of the area covered by system has access to water for at least 125 days or more a year. The situation is even worse for people that live in outskirts of the city. As a result, private sector organisations have recently begun providing potable water. For them, the water scarcity problem in the state represents a new avenue to accumulate huge profits. The streets and roads in the cities of Edo as in every other state in Nigeria, are littered with polythene bags from sales of sachet water. This is presently the only way for most people in Benin to get drinking and domestic water. Unfortunately these sachets are not checked by the government to ascertain water quality. In addition, individuals and companies that have completely lost confidence in government water supply schemes drill a minimum of 30 boreholes daily in various parts of the state.

Corruption is one of the major causes of the water problems in the state of Edo. In the past, water pumps and other equipment needed by the Board were bought directly by the executive arm of the government. This allowed for the misappropriation of funds under the pretence of using the advantageous position of the executive arm to judiciously spend government funds. Most equipment purchased by the executive arm of the government has proved useless to the state water programme because it was purchased without the input or consent of the Board. In addition, water projects of the state government have been poorly funded. As a result the State Water Board cannot afford to hire sufficient professional staff. Indeed, there have been instances where even the existing, poorly paid staff have not received their salaries for as long as four months at a stretch.

The Edo State Water Board operates its water supply schemes through nine reservoirs, three of which are being constructed with support from an African Development Bank (ADB) project. The remaining six reservoirs are almost useless due to the poor supply of energy provided by Nigerian Electric Power Authority (NEPA). NEPA is the only institution mandated to generate and supply electricity to all sectors of the country. As a result of poor energy supply, even in situations where the Board is ready to perform its duty to the society, it is hindered. At present, the Urban Water Board generally receives less than five hours of consistent energy per day. The State Water Board has, as a result, been unable for some years to pump water from reservoirs directly through pipe networks to consumers.

It is difficult for underprivileged communities in Edo to get involved in water development projects. In order to obtain, for example, a borehole project, a community needs to be politically influential; even then it has to wait for decades. Even politically powerful individuals who try to fill their community's needs are often turned down. In

cases where an oppressed and marginalised community's case becomes glaringly bad, projects still have to get approval from the state House of Assembly, all of whose members require well-greased hands. What a dehumanising process to get water, one of God's most abundant natural resource?

Since water has turned into an issue of life and death, most of the less represented communities or villages have completely ceased pressuring the government for support in water provision. Instead, community self help water programmes have recently begun to emerge in the state. One example is the Uruokwuosa water project. This community built a borehole water project for themselves through efforts facilitated by contributions from all members of the village. The Uruokwuosa water project is one of only a very few cases of community self help initiatives in response to neglect by the elected government.

WAYS FORWARD

Having analysed the various problems facing the management of water resources and the incessant violation of the human right to water in Nigeria, this paper argues that only a truly democratic government, committed to the protection of the human and social economic rights of the people, can rescue Nigerians from the web of an acute water crisis. I hereby recommend that the Federal Ministry of Water Resources by government and the 11 River Basin Development Authorities mandated with powers to manage Nigeria water should be democratised, empowered and well funded.

To ensure co-ordination among the various bodies, the administrative machinery for managing the country's water resources needs to be streamlined and the functions and powers of the various bodies set out clearly. Data on Nigeria's hydrology and water resources should be improved. A nationwide comprehensive survey of Nigeria's surface and underground water resources should be undertaken. There is also need for an extensive training programme to produce the necessary skilled manpower to develop our vast water resources.

In the area of governance, water management authorities should be democratic and empowered to perform their duties without interference from the executive arm of government. Local people, especially women and children, should be invited and considered when water decisions are being made in Nigeria. Finally, water resource allocation in Nigeria should be completely democratised to prevent the marginalisation of minority groups. Policies should be made in favour of the right of people to water, especially at this stage of democracy in Nigeria. We look forward to a country where water rights are protected and pursued as first generation rights, part of THE RIGHT TO LIFE. I believe that one day, if we struggle together and hold a common vision of our right to water with consideration for the less privileged minorities at global level, we shall certainly have water for all. This is our dream and the dream of all who believe in the liberation of the oppressed.

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THE IMPACT OF INSTITUTIONAL REFORMS IN WATER MANAGEMENT ON THE POOR IN PAKISTAN

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ABSTRACT

Institutional reforms in water management in the form of phased programmes in pilot areas are underway in Pakistan. The reform process was initiated in Bahawalnagar District in Punjab in 1994 and has since spread elsewhere. The reforms will have a far reaching impact on the agrarian socio-economic structure of Pakistan. ActionAid-Pakistan is analysing the likely effects of the reforms on the poor and marginalised segments of the rural population, especially in terms of their empowerment, participation in grassroot level development activities, food rights, security and the degree to which their livelihoods are sustainable.

INTRODUCTION

The Indus Basin Irrigation System of Pakistan, the largest and the most complicated in the world, is now aging and facing multiple problems, including high conveyance losses, inequitable distribution of available water, low delivery efficiencies, waterlogging and salinity, and low collection of operation and maintenance expenditures. Considering these problems, in the early 1990s the World Bank proposed the commercialisation and privatisation of the system as the only choice for its rehabilitation. After a series of negotiations, however, the Government of Pakistan agreed to have three changes:

1. The conversion of existing Provincial Irrigation Departments to Provincial Irrigation and Drainage Authorities (PIDAs),
2. The setting up of Area Water Boards (AWBs) at canal command levels, and
3. The formation of Farmer's Organisations (FOs) at distributary and minor canal levels.

Because of the complexity of the reforms, it was decided to begin with pilot projects in each province. The institutional reforms were intended to promote the participation of farmers in the operation and maintenance of the system, in the distribution of water and in the collection of water charges.

PIDA Acts were promulgated in all four provinces of Pakistan in 1997 and were followed by the planning and setting up of one pilot AWBs, in each province. The formation of Farmers' Organisations/Water Users Federations (WUFs) had been started in a few distributaries in Sindh and Punjab even before 1997.

In Pakistan, 81 per cent of farms are small, with less than 5.7 ha (12.5 acres) and their cultivators, who are the most important stakeholders in the irrigation reforms, work in poor conditions. Because water is of fundamental importance to poor landholders of this type and because the institutional reform process is complex, a pilot research was conducted in two sample areas to document the impact of the institutional reforms at the grassroot level. Our objective was to share the findings of this research with concerned government officials, donor agencies and civil society in order to improve the implementation of the reforms. The study focused on farmer awareness and views on reforms and on the level of participation of poor farmers and women.

Methodology

The research was based on literature reviews; interviews with individuals in the government, donor agencies and civil society organisations, and participatory field research in the farming communities where the reforms are being implemented. The literature review documented existing conditions in irrigation systems and the proposed institutional reforms. It highlighted the fact that, even under the reformed PIDA and AWB structures, where farmer's representation is more than 50 per cent, nothing ensures the representation of small farmers (see annex). Interviews with government, donor and civil society organisations enhanced our understanding and broadened our vision regarding proposed reforms. These activities, however were largely, a backdrop to our primary focus, participatory fieldwork in communities.

The field locations research were selected through multi stage cluster sampling. At the first stage, two of the oldest FOs/WUFs of Punjab at Sirajwah and Hakra 4-R (distributaries) in Bahawalnagar District were selected. In the second stage, the distributaries were divided into head, middle and tail sections to ensure a diverse representation. Nine watercourses, distributed across all three sections were selected from each distributary. Data collection focused on qualitative information using PRA tools such as semi-structured interviews; transact walks, direct observation, and informal and focus group discussions. A sample of 730 respondents including farmers, women, tenants, and agriculture wage labourers, were contacted. Twenty five per cent of the sample comprised of women. The majority (80 per cent) of male respondents were small farmers. Non-owner cultivators (tenants/sharecroppers/contractors/wage labourers) had a representation of 18 per cent in the sample.

Socio-economic profile of the area

In both the sample distributaries most farmers are small (76 per cent in Sirajwah and 82 per cent in Hakra 4-R) and own less than 12.5 acres of land. This aside, however, conditions in the distributaries were significantly different. Villages along the Sirajwah distributary appeared generally distressed as the population had a low level of education, limited opportunities for choices of income generation, lived in mud houses, and faced major waterlogging and salinity problems. In contrast, villages along the Hakra 4-R distributary were more developed. They had higher literacy levels, more options for income generation (e.g. government service, business, etc.), liked cement houses, and faced less waterlogging. In addition they cultivated value added commodities such as fruits and vegetables.

Awareness

The underdeveloped areas exhibited low awareness levels regarding irrigation system reforms. At Sirajwah Distributary, where conditions are poor, even though the process of establishing farmers' organisations started years ago, 88 per cent of the male respondents were still unaware of either the existence of the WUF or other institutional reforms. Women were totally ignorant of the WUF and reforms (table 1).

As the data in table 2 indicates, awareness levels at Hakra 4-R Distributary were higher than those at Sirajwah. Even though the respondents were aware of the existence of the WUF a large majority of them at both distributaries were unaware of the activities of the WUF.

TABLE 1
PERCENTAGE DISTRIBUTION OF RESPONDENTS BY SEX, AWARENESS LEVEL/OPINION ABOUT REFORMS AT SIRAJWAH DISTRIBUTARY

Gender	Aware	Unaware	Against	Favour	Indifferent
Male	12	88	85	10	5
Female	0	100	95	0	5

Total respondents: Male = 274; Female = 97

TABLE 2
PERCENTAGE DISTRIBUTION OF RESPONDENTS BY SEX, AWARENESS LEVEL/OPINION ABOUT REFORMS AT HAKRA 4-R DISTRIBUTARY

Gender	Aware	Unaware	Against	Favour	Indifferent
Male (277)	80	20	70	30	0
Female (82)	65	35	65	35	0

Total respondents; Male = 27; Female = 82

TABLE 3
FARM SIZE AT SIRAJWAH DISTRIBUTARY AND REPRESENTATION IN THE FO/WUF

Farm Size (acres)	Distribution in command Area (%)	Representation in WUF/FO (%)
> 5	40	0
5- 12.5	36	11
>12.5-25	17	0
Above 25	7	89

TABLE 4
FARM SIZE AT HAKRA 4-R DISTRIBUTARY AND REPRESENTATION IN FO/WUF

Farm Size (acres)	Distribution in command Area (%)	Representation in WIF/FO (%)
> 5	56	0
5-12.5	26	0
>12.5-25	12	20

Participation in water user federations/farmers organisations

Representation in the WUF at Sirajwah distributary was found to be highly skewed toward larger farmers. While 76 per cent of the command area is made up of farms that are 12.5 acres or less, only seven per cent of the WUF members have landholdings this size. Landowners holding more than 25 acres make up 89 per cent of the membership in the WUF (table 3).

At Hakra 4-R distributary, farmers owning up to 12.5 acres had no representation despite the fact that they occupy 82 per cent of the command area. Farmers owning more than 25 acres are disproportionately represented, they make up 80 per cent of members (table 4).

Given that 80 per cent of the people at Hakra 4-R distributary were aware of institutional reforms, it is important to understand what prevents them from participation in then. Farmers relate this lack of participation to the socio-economic and political context, in which small and poor farmers depend on large farmers in many ways. Specific constraints mentioned by the respondents during the fieldwork included the need of small farmers to:

- Rent land for sharecropping;
- Get farm machinery;
- Obtain green fodder for livestock; and
- Obtain support in police cases.

Most of the respondents at both the distributaries who are informed about their area a WUF described them as ineffective and alleged that members were misusing their positions in order to obtain a disproportionate share of available water. The federation members, on the other hand, were eager to take over the distributary system.

Women

Women, especially those from the poor farmer class, were actively involved in agricultural activities such as hoeing, cotton picking, kitchen gardening and crop marketing. Some of the women respondents also mentioned their involvement in watering fields and desilting watercourses.

Irrigation water has other uses that are particularly important to women, such as washing, bathing, domestic consumption, construction of mud houses, etc. Livestock, which appeared to be one of the most important sources of livelihood, are also heavily dependent on water, which is supposedly meant only for irrigation. Women contribute heavily to all these water-dependent activities. As a result, their role cannot be over looked. Even if they are not irrigators, they should 'qualify' to be part of the reform process and have membership in the Water Users' Associations. One respondent mentioned the importance of women in Water Users' Associations (WUA) saying, 'had women been involved in WUAs, they would have emphasised their requirements.'

Institutional reforms

Although many respondents mentioned unfair practices of the irrigation officials, a large majority had reservations regarding reforms. They feared the domination of large farmers in the distribution and management of irrigation water and high water charges, which they would not be able to afford. In addition, they worried about the WUA making claims on their resources (time, labour, money, and equipment–all of which are already scarce) for maintenance of the system.

Views of other stakeholders

Most government officials, donor agencies and civil society organisations interviewed during the study expressed concern regarding implementation of the reforms. Even the staff of the Irrigation Department had reservation about reforms and had fears regarding their own future roles. Other organisations, such as the Agriculture Department (excluding the water management wing) appeared poorly informed; their staffs were unaware of the reform activities in irrigation. While most individuals interviewed were skeptical, a few hoped that the fears and reservations would be eliminated with the passage of time.

Recommendations and suggestions

- For the reforms to succeed, more debate and consultation are needed. This is essential in order to involve all the stakeholders including farming communities, the agriculture department (all wings), the department of rural development, and the numerous civil society organisations working in rural areas.
- Awareness raising campaigns, using electronic and print media, should be started to ensure effective participation of the communities in the consultation process. Radio could be an effective medium.
- Capacity building of key stakeholders such as the irrigation and agriculture departments is essential.
- There is a need to ensure proper and effective social mobilisation focusing on all the stakeholders in the farming community.
- There should be a clear structure ensuring proportionate representation of small farmers and women in the FOs, AWBs and PIDAs.
- Further research is needed in other pilot areas where these reforms are being introduced.
- In-depth research is required on the dynamics/factors, which hinder the full participation of small and poor farmers.
- Identification/understanding of water reforms success stories in developing countries would assist in relating these stories to our socio-economic context.

NOTE

1. Established in 1972, ActionAid is one of the UK's largest development charities. It works with over five million people in the developing world, helping them achieve improvements in the quality of their lives. ActionAid is secular and non-political. It works with the poorest people, regardless of religion, race or political persuasion. ActionAid works in more than 30 countries in Asia, Africa, Latin America and the Caribbean. Through long-term development projects set up in close consultation with local people, it aims to reduce poverty and bring about lasting changes in people's lives. ActionAid has been working in Pakistan since 1992. Its mission is to eradicate absolute poverty by facilitating the process of empowerment. ActionAid aims to achieve this by creating, sharing and providing opportunities for greater awareness, skills and resources to the poorest and disadvantaged.

ANNEX

COMPOSITION OF AUTHORITY AND AWBS IN PUNJAB PROVINCE

Description	Designation	No.
A. Authority		
Minister, I and P	Chairman	1
Chairman P and D	Member	1
Secretary Finance	Member	1
Secretary I and P	Member	1
Managing Director, PIDA	Member	1
Farmer's Representatives	Members	6
B. AWB		
Farmer's Representatives	Chairman*	1
Representative of Authority	Member	1
Technocrats in Water Management		36 per cent
and Finance	Member	2
MD of AWB	Member	1
Government Representative	Member	1
Representative of FOs	Member 8**	64 per cent

Source: IIMI Report C-12

* Chairman is to be selected from amongst the members of the FOs

** Three members from tail portions of distributary and minor canals are included

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COMMUNITY MANAGEMENT OF WATER: THE CASE OF UMBELUZI BASIN, MOZAMBIQUE

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ABSTRACT

Access to water resources and the efficient and equitable use of water have become two of the most critical aspects of government policy and community development around the world. The Mozambican government, for example, is now engaged in the development of water policy and management. The analysis of local people's water management practices, their perceptions of water management institutions and the implications of public policy for the rural water supply system in the Umbeluzi Basin of Mozambique is the main concern of this paper. Economic activity in the communities of the Umbeluzi basin is based on both rainfed and irrigated agriculture and on animal husbandry. The area is served by three different water systems: piped water for domestic use; water for irrigation purposes; and, also to meet domestic needs, public drinking fountains supplied by boreholes and equipped with electrical pumps (i.e. standpipes). Under the current water rights system, water drawn from rivers is free, whereas water stored in dams built by the government or water pumped directly from rivers is sold at a uniform price throughout the country. This price is set so that only operation and maintenance costs are recovered; capital costs are not. Likewise, drinking water from standpipes is priced to recover only operation and maintenance costs. The overall strategy is to ensure that access to water for multiple uses (drinking, irrigation, etc.) is defined by the government. An integrated approach to planning and implementation, based on the principles of sustainable development, is now being implemented through a series of reforms.

INTRODUCTION

Since 1998 the Nucleo de Estudo de Terra e Desenvolvimento at the Eduardo Mondlane University has been engaged in a water resource management study as part of the Broadening Access and Strengthening Input Market Systems (BASIS). This study draws on the first broad theme of BASIS broadening access to water resources through decentralised, equitable and efficient management systems. This component is being carried out in Mozambique, Zimbabwe and Malawi. All three countries face various problems related to water resource management. Malawi and Zimbabwe already face water scarcity problems, whereas Mozambique may face this problem in the near future because of fast-rising demands for water and because of its position downstream on most major rivers.

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2. *Nucleo de Estudo de Terra e Desenvolvimento Eduardo Mondlane University Mozambique*

The Umbeluzi basin, with a catchment of 5,600 sq km, is the focus of this study. This area has two distinct seasons: the rainy season from November to April in which flooding is not uncommon, and the dry season from May to September, in which the volume of rain is very low. The sample units for this study are Massaca I, Massaca II and Mafuiane, new villages established in the 1980s; they comprise populations resettled by development projects, Mozambicans who returned to the country when it became more stable in the mid 1990s and migrants/refugees from neighbouring countries.

BACKGROUND

In the 1980s and the early 1990s, the Umbeluzi basin underwent some major transformations, first with the establishment of the Pequenos Libombos Dam in the early 1980's and then in 1994 when the government established the Estação Agraria de Umbeluzi (Umbeluzi Irrigation Scheme). These two projects entailed resettlement programmes Mafuiane village was established in 1981 and Massaca I and II in the mid-1990's. In addition to these two events, the peace process in 1992, followed by the first multi-party general elections in 1994, resulted in relative stability in the country and the return Mozambican refugees from neighbouring countries. This inflow was compounded by a wave of refugees from Burundi, Rwanda, Congo, and Angola. Massaca I and II about five and eight kilometre distance from the Libombos Dam and the Umbeluzi Irrigation Scheme respectively accommodated this surge on population.

The total population of the studied villages is 14,942 (INE,1997). Out of 158 households interviewed, 80 were headed by men and 78 by women. Nearly 23 per cent of households are headed by men who migrate to neighbouring countries for jobs. The average household has four to five members. About 68 per cent of households live in houses made of cement blocks and covered with iron sheets. About 62 per cent of households have a bathroom and 86 per cent use a separate toilet (*latrina*).

The economic activity of the communities is based on agriculture and the rearing of cattle, goats and poultry. About 78 per cent of households interviewed depend exclusively on agriculture and animal husbandry, while 37 per cent combine agriculture with wage labour. On the latter group 19 are headed by women. Fishing is a subsidiary activity basically to meet food demands. Crops and livestock are usually sold locally and in Maputo City. Farmers have formed associations, which assist individuals in gaining access to basic services and linking them to governmental organisations which provide irrigation, power and other services.

Agriculture is both rainfed and irrigated. Irrigated agriculture is practiced on 385 ha by 490 households while rainfed agriculture is practiced on 2066 ha by 1035 households. The average land use for agriculture per household is less than one hectare.

The most important crops are maize, bananas, beans and other vegetables. Only 55 per cent of households interviewed cultivate maize as a single crop, 63 per cent inter-crop. Although the majority of households produce maize for their own consumption, about 42 per cent produce this crop for the market, 55 per cent of the maize is sold in the local market. Other major crops for the market are peppers (41 per cent) and bananas (21 per cent). Although 47 per cent of households interviewed can afford to apply fertilizers as ammonia sulphate, the majority use traditional techniques such as applying compost and manure, intercropping and cropping rotation. Crop production employs both household and hired labour and sometimes work parties are organised. The majority of households rely on rudimentary instruments; a very few farmers use ploughs, either ox-drawn or drawn by donkeys, and some use farm machinery such as tractors when they can afford to rent them. At a cost of about US$ 10 per hour tractor rental is rare.

Access to land, land reform redistribution, efficient and equitable use of land resources have become issues central to government policy and community action. One of the most important aspects related to land tenure in the Umbeluzi Basin is that the majority of the irrigated plots especially in the Massaca scheme belong to non-resident farmers. Non-resident farmers usually hire workers, in particular former owners of the land who still live in the area. Local farmers usually lose their land because local farmers fail to pay the charges for water and electricity (for electric pumping stations). They are then forced to sell their land to people from Maputo City, who pay between US$ 850 and US$ 1,150 per unit. About 21 per cent of current land holders bought their land from local residents.

Land transaction involves local community leaders, the local farmers association and the extension workers. Unlike in Massaca, in Mafuiane most of the irrigated plots belong to local farmers, who comprise about 60 per cent of households. About 57 per cent obtained their land before the peace accord in 1992, while 62 per cent acquired their plots after 1992. Families who inherited their land from their relatives comprise 22 per cent. In the three villages, the farmers are gathered in small associations, which are the main vehicle linking them to the *ARA SUL* (branch of the National Water Management Agency) and the Irrigation Scheme Board.

APPROACHES AND METHODOLOGIES

The main approach and methodology used in this study was to conduct a baseline survey to identify basic information about households: household composition; sources of income/livelihood; water use, including water pricing; irrigation system management; sanitation; pollution issues related to; demand for water; and child morbidity. In addition, we made visits to the small irrigation schemes in the three selected units of analysis.

Additional information was obtained largely from interviews with officials at *ARA SUL* DNHA *(Direcção Nacional de Hidraulica Agricola*), the Ministry of Health, small farmers at the site, officials and extension workers (including officials from health service, agriculture, and administration) at the district level and from in-depth studies concerning the following topics:

- Farming system and gender;
- The prevailing practices of water storage by households;
- The conventions of use in the collection of water from different sources for different uses, different seasons, and by different categories of persons;
- The prevailing sanitation practices: bathing, defecation, rubbish and waste-water disposal;
- The relationship between water price and various levels of costs for different categories of farmers.

WATER MANAGEMENT ASPECTS

As mentioned earlier, the three sample units are served with the different water systems: piped water for domestic use, piped water for irrigation purposes, and a third water system for domestic use as well. The latter comprise 51 public drinking fountains (standpipes) supplied by a borehole located close to the Umbeluzi River and equipped with an electric pump. The majority (60 per cent) of households rely on the standpipe system.

It appears that there is relatively more and stronger government involvement in water management through *ARA SUL*. In fact, both Massaca I/II and Mafuiane are typical of many villages: both the government and farmers are supposed to be involved in scheme management but in practice farmers participation is little. In fact, small farmers do not participate in water management, planning, etc. as their association only serves to link the farmers with *ARA SUL*, *Casa Agraria* (the irrigation scheme board) and EDM (the electricity supply company). Small-scale water users are now in a particularly disadvantaged situation since full participation in water matters has been restricted to commercial farmers.

It is important to note, however, that there is a distinction between Massaca I/II and Mafuiane in terms of the involvement of farmers in water management. As mentioned earlier, while in Mafuiane the majority of farmers are local residents, in Massaca they are mostly non-residents. Thus, while it seems that there is no participation (or, if it does exist, insignificant participation) by farmers in water management system in Massaca, in Mafuiane where the situation seems quite stable, the water management system does involve local users. Here, the community plays a key role in raising people's consciousness

and awareness about the need for conservation, and how to protect the water infrastructure against thieves and misuse.

In both cases management at the village level is basically in the operation, repair and maintenance of the water supply systems. Households are likely to sign contracts with *ARA SUL* in order to access piped water; the volume supplied is measured using counter devices. Contracts are signed by individuals or by groups of ten to twelve households who are supposed to share the bill every month. The water price for domestic use is different and variable, it is more expensive in Massaca II than in Massaca I. This is due to the difference in distances between the villages and the water source and to the application of the more expensive Boane Town pricing system in Massaca II, while Massaca I village uses the cheaper irrigation pricing system. The reasons for this discrepancy are unclear. In Mafuiane, where there are measuring devices, the cost of water simply varies according to the users' consumption.

While at Massaca I and Mafuiane the average monthly expenditure on domestic water is estimated at US$ 40 for water from public standpipes, and US$ 1.70 for piped water, at Massaca II costs varies range US$ 60 to US$ 2.70 respectively. In general, about 63 per cent of households spend less than US$ 60 monthly; nearly 18 per cent spend more than that amount. It is notable that about 64 per cent of households interviewed believe that water is expensive. Obviously, the number of members on a household has a direct bearing the cost of water as household size contributes directly to the amount of water consumed the greater the number of persons in a household, the higher the cost of water.

The cost of water for irrigation is currently US$ 10 per month for each irrigated plot in both schemes, Massaca I/II and Mafuiane. This is significantly higher than amounts charged for domestic uses both in the schemes and in nearby Maputo city. Around 39 per cent of the sample households have irrigated plots. It is unclear, however, what criteria were used to determine this price and implicitly to set a value for water. It is, however, clear that the price is related to the costs of electricity and repair and maintenance of the system as a whole and not to recovering installation or development costs. Overall, the price of water (whether used for irrigation or domestic purposes) is calculated to cover the costs of electricity and the repair and maintenance of the system as a whole.

In terms of water consumption for irrigated agriculture, there is no strict regulation of appropriate crop rotations. According to extension workers and experienced farmers, regulation would improve disease and pest management and hence help to ensure a consistently high quality of the crops grown. There is little farmer innovation in trying different crops, most focus on conventional crops; such as maize, beans, cabbage, banana, green vegetables, tomatoes, onions, and peppers. Most farmers are used to growing multiple

types of crops at the same time. Trying different crops is left to individual farmers. While this ensures freedom and flexibility for the farmers and also reduces the chances of flooding the market with one crop (relatively to the few farmers who produce for the market), this approach compromises water use efficiency quite significantly. Because of the diversity of crops grown, it is difficult to tailor water deliveries to the needs of individual crop types. The efficiency of use is, as a result, low.

In addition to the inefficiencies inherent in the diverse cropping patterns, most farmers are not sure of crop water requirements and have little incentive to increase efficiency. As long as others are irrigating, no farmer chooses to forego his share of irrigation water unless some incentive is present for water conservation. At present, farmers are billed a flat fee for irrigation regardless of the amount of water used or the type of crop grown and the stage of the crop. In many situations, two or three farmers are harvesting their crop and need no irrigation, while others' crops are still being irrigated and require a lot of water but all pay equal bills for water.

When interviewed by the research team, most farmers said that they cannot understand why water for agricultural purposes is more expensive than the water consumed in Maputo City regardless of the amount used. The high cost of water is one of the major problems faced by small farmers. Some are unable to pay their water bills and have decided to sell or rent their plots to other people. As noted above, the new owners have in turn hired the former owners of the plots as their workers. To add to the hardship, those farmers who are forced to sell or rent their plots due to financial problems are required to pay a US$ 115 fee to Casa Agraria.

The high cost of water for irrigation has significant implications for access to land. There is a serious lack of security in land tenure among small farmers on the irrigation schemes as they can be evicted from the scheme (or forced to sell their plots) at any time if they do not pay for water. One can say that the right to land is associated with the capacity to pay for water.

In addition to the land tenure concerns associated with the irrigation systems, environmental issues are important in the implementation of water supply systems in the villages. The piped water system for domestic supply is environmentally sound with respect to health aspects. There is no run off that could cause waterlogging or lead to the spread of common regional diseases such as diarrhea, malaria, and bilharzia. While the supply system appears safe, major concerns are present due to the lack of facilities for wastewater treatment. It has been asserted that inadequate sanitation and clean water provision remain the most serious of all environmental problems in terms of the scale of human suffering. According to results of bacteriological studies carried out in the Movene River at Mafuiane, levels of coliform bacteria were at about 2400/100 ml (Guale, 1999), which means that the water may not be suitable for human consumption. Exacerbating is potential risk of

contracting diseases is the lack of treatment of water by local communities as about 64 per cent of households confirmed. Although most of the households interviewed said that their water was of good quality, diseases such as diarrhea and malaria are common. While untreated wastewater could contribute to the prevalence of these diseases, the design of the irrigation systems could also be a factor. In both schemes irrigation is provided by surface canals. This design, in addition to increasing concerns about disease, also carries a potential risk of uncontrolled run off, soil erosion, and waterlogging if appropriate measures are not observed.

Overall, the water systems in the village schemes have significant flaws. These have to do first with the lack of treatment facilities for wastewater and second with the poor design of the irrigation systems.

INNOVATIVE POLICY

The process of water supply consumes economic resources, thus making water an economic commodity. While it is widely understood that water in Mozambique is a scarce resource and poorly distributed amongst users, in the past little was done by the government and/or by the institutions and agencies in charge to address these issues. However, for the last few years there has been an effort to improve water management capacities, particularly through developing the exploitable potential and placing greater emphasis on more efficient and equitable use of water. The DNHA, with financial support from FAO, is now drawing up the National Irrigation Policy and Strategies for implementation; they include the decentralisation of water management systems, where local users (whether small or large farmers) are called on to play a more active role.

Under the current water rights system, water drawn from rivers is free, whereas water that is stored in dams built by the government or water pumped directly from rivers is sold at a single flat rate throughout the country. According to *ARA SUL*, the organisation which collected this data, this flat rate which is now US$ 0.22/cubic meter for irrigation and U S$ 0.38/cubic meter for industry, is set so that only operation and maintenance costs are recovered capital costs are not included. Likewise, drinking water from Agua Rural, that is water at taps or standpipe stations, is priced to recover only the operation and maintenance costs.

It has been realised that the price that is charged for agricultural water does not reflect the true cost of the water to the users. In effect, the price acts as a subsidy for water users. Despite the fact that water is subsidised, the main problem faced by small farmers is the cost of obtaining it, which seems to be related to the high cost of the electricity used at pumping stations. Consequently, the cost of water delivery is high and, as a result, the price of water under the flat rate system is set at a high rate.

Attempts to rationalise approaches to valuing water by allowing the market to determine water prices are difficult to implement. Developing market prices for water is a difficult task for a few basic reasons, including the following:

- Customary attitudes. Locals believe that water is a gift from God and thus an infinite resource;
- There are physical barriers to the development of water markets since measuring devices need to be installed and monitored to effectively control water usage. *ARA SUL* is now planning to embark on a large-scale project to set these measuring devices, especially for commercial farmers;
- Legal obstacles such as the need to review the existing water policy with respect to its allocation system require a legal instrument that spells how to change the allocation mechanism in order to improve its transparency; and
- A suitable water irrigation policy is lacking.

The allocation of a scarce resource should be dictated by the demand for that commodity and by the willingness of the consumers to pay for it. Since water is scarce, its opportunity cost should be taken into consideration when determining its price. In the Umbeluzi basin, people have realised that water is scarce and is rapidly becoming scarcer. Although the study area is actually plentifully served with water there are competing users and uses to which water has to be rationally and fairly distributed.

WATER POLICY AND INSTITUTIONAL ISSUES

A recent World Bank publication on rural development (World Bank, 1997) says succinctly: 'Many developing countries have institutional frameworks and agricultural policies that discriminate against the rural sector, under-invest in technology development and dissemination, maintain inappropriate agrarian structures, lock up arable land in low productivity ranching, undervalue natural resources and therefore waste them, seriously under-invest in the health and education of rural population, discriminate against private sector initiatives in food marketing, and fail to maintain existing or invest in new rural infrastructure. Unless these policies, institutions, and public expenditure patterns are corrected, the world will not have abundant food supplies'.

Specific water-related policy issues include the need for secure water rights in terms of water quantity and quality, appropriate water pricing, and laws pertaining to water users. Having legally secure water rights is important to enhance the efficiency or productivity of water resources especially when water rights are transferred (from sellers to buyers of land). As often is the case in rural areas, the concept of water rights seems to

be alien to the Umbeluzi basin. Water pricing is often equally controversial. When water is a scarce good, however, good management includes measuring flows and pricing water accordingly. Laws pertaining to water user associations deal with the devolution of water rights from decentralised bureaucratic agencies to farmers and water user associations (Kijne, 1999).

In Mozambique the overall strategy for access to water for multiple purposes (irrigation, drinking, industry, etc.) is sustained by government. It is the authors' opinion that an integrated approach to planning and implementation, based on the principles of sustainable development should be used. Furthermore for sustainable management, to be achievable, the following reforms should be embarked upon as a matter of priority:

- Implement legal reforms, especially in water legislation, to allow greater and more equitable usage of water for developing irrigation and/or other activities;
- Include water-pricing in water management;
- Design and implement a national irrigation policy;
- Adopt the river basin as the unit of irrigation planning and development;
- Involve all stakeholders in planning and development processes. The participation of interested parties is currently through the Umbeluzi River Board. As previously noted, small-scale users are in a particularly disadvantaged situation since full participation in water matters has been restricted to commercial farmers;
- Practice institutional strengthening and coordination among DNA (Direcção Nacional de Aguas), DNHA, DNER (*Direcção Nacional de Extensão Rural*), and other relevant institutions in order to ensure their capacity to execute an expanded programme of action;
- Make international arrangements with Swaziland, the upstream country, to coordinate the sharing of water to ensure its availability downstream and to prevent environmental problems; and
- Invest in irrigation research, technology development and testing.

In the reform of the legal framework we envisage the review and updating of water legislation as a prerequisite for a future expanded programme of action. The legislation needs to be updated in order to reflect the current social, economic, political and environmental needs and realities. A more equitable distribution of water resources is necessary for suitable irrigation development.

Management must also include water pricing. This can be done by placing different tariffs on different economic groups of users or by charging for the volume of water consumed. A more problematic issue is the extent to which communities should pay for the use of water for domestic and primary purposes. A key hindrance to government

efficiency appears to be the high subsidisation of essential services. In the future this policy should be reversed.

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CRAFTING A COMMON PATRIMONY OUT OF THE TRANS-APPROPRIATIVE NATURE OF WATER RESOURCES

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ABSTRACT

How does one grasp the complexity of water values and implement them in an effective and legitimate way? Since 1975, the French way of addressing action problems related to environmental quality has led to the formalisation of an innovative approach called 'patrimonial strategies'. From a methodological point of view this approach marks a break with the utilitarian approach to economic theory and with the property rights paradigm. In as much as the actual quality of water resources is trans-appropriative, it goes beyond the concerns of public or private property. Empirical evidence suggests that a complex web of actors (both private or public, including domestic users, agriculturists, industrialists and government agencies) has a significant impact on the quality of water resources. While they have different patterns of interaction with respect to water resources, i.e. different visions, strategies and objectives (be the health care, irrigation, access to drinking water, environmental sustainability, etc.), they face a common problem: the overall degradation of water resource qualities. However, actors by virtue of their action on the resource, i.e. performance, are in a position to co-supply and co-demand a certain level of quality. Thus, they become potential negotiators of patrimonial contracts for quality. This paper examines the core concepts of the total quality of water resources, trans-appropriativity and common patrimony. The procedure of patrimonial audit, which consists of 'identifying' stakeholders and quality systems, 'diagnosing' problems, 'prospecting' scenarios and formulating 'action proposals' and the potentialities of a local common patrimony of general interest, is outlined.

INTRODUCTION

Contemporary societies, whether they belong to the developed or the developing world, face a crisis of management with respect to the conservation of living systems.[1] Within any living system humans constitute an integral part, perhaps as important as the very ecosystem that we aim to conserve. Natural and human-induced changes affect societies and livelihoods at both local and global levels. Specific examples of changes are floods, soil erosion, scarcity, desertification, domestic sewage and chemical effluents, salinisation and alkalinisation. The health of living systems, which are a common heritage for all should be

seen as a common patrimony. The question is how one understands the proposition of a patrimonial approach to quality management.

A related question is: anyone *de jure* or *de facto* owns rivers, runoff and floods, the physico-chemical properties of surface and underground waters, the drainage capacity of watersheds or the viability of underground water recharge systems. In fact, no rightful owners who lawfully hold (private or public) property are put in charge of or are capable of commanding these attributes. These are global characteristics, which we will call 'qualities', or *res nullius*, i.e. *de jure* nobody's property. These qualities result from more or less explicit interactions between natural and social dynamics at different spatial scales, organisational levels and time horizons. Finally, actors, whoever they are, will have no other choice than to resort to their visions, negotiate performances and co-ordinate strategies. Thus, by addressing actors directly, the patrimonial approach favours pragmatism as a more efficient means of identifying and tackling action-problems'.

The patrimonial approach was developed from 1975 to 1980 within the French Ministry of Agriculture.[2] Since the approach is based on systematic research communication and negotiation, the patrimonial audit is a cognitive tool for assisting action-oriented interventions. The approach proposes concepts, methods and procedures.

The kinds of 'action problems' encountered

An action-problem derives from tension between an actor and a phenomenon. Action problems[3] refer to a large number of situations in which actors make independent choices in an interdependent situation (Ostrom, 1998). Therefore, the emphasis is put on actors' visions, rationales and strategies rather than on objective i.e. scientific, knowledge. Action-situations can be divided into the following three types:

i) Actions with one actor making a decision within the framework of existing public regulations, among which property rights and functioning as a 'responsibility box', ensure autonomy of action. The action-problem can be defined in terms of the objective of maximising benefits and using costs and benefit analysis.
ii) Actions with two or a few actors in a single territory there are two or more mutually exclusive projects within the framework of existing public regulations. For example, two government agencies, Like the Forest and Irrigation Departments, compete for exclusive projects on public land without human settlement (like forest biodiversity conservation or building a dam for hydropower generation). The problem can be defined in terms of multi-criteria analysis and the logic of negotiation.
iii) Intrinsically complex actions with many actors involved in one territory. There are (n) projects, and (n) actors. An example is an aquifer or a river whose recharge system spreads over one or several watersheds, i.e. a water basin. Since empirical

evidence reveals a complex web of actors who have an impact on the characteristics and politics of the water resources the relevant approach to deal with the complexity will be one of stewardship, i.e. patrimonialisation.

The actors face a complex reality, i.e. the interdependence of their strategies, but this is not often recognised as such since interdependence contradicts the prevailing representations of property rights as 'responsibility boxes'. However, actors, by virtue of their action (or non-action) with respect to resource use, i.e. performance, are in a position to co-supply and co-demand a certain level of quality of resource use. Thus, actors become potential negotiators of conditional improvements in their respective performances, i.e. of patrimonial contracts for total quality.

Concept of 'total quality'

The quality of water resources is 'total quality', a meta-quality or a global characteristic. Total quality is simultaneously actual and potential, material and immaterial. Therefore, the concept of total quality explicitly aims at encompassing the multidimensional, complex and multi-actor nature of water resources. Total quality is

a) Actual quality from which actors benefit at the present time (be it from water flow for navigation or runoff for hydropower generation, water suitable for irrigation, industrial or domestic purposes, overall accessibility, ability to support wild flora and fauna, purity with respect to religious purposes, etc.).
b) Potential quality results from the impact of actual quality on future opportunities or alternative uses (it refers to the phenomenon of irreversibility, the threshold level of investment, etc.).

Therefore, the management of the total quality of water resources implies:

- The ability to choose and maintain a certain level of quality called 'effective quality goals' by confronting and assessing the impact of each elementary action or and rules adopted (or not adopted) governing both the actual quality and the quality system.
- The effective ability to update 'effective quality goals' and rules through an organised process of confrontation and negotiation among the community of stakeholders.

Nevertheless, since actors have their own, broadly implicit, understanding of the resource as well as its qualities and the system they belong to which in turn determines their preferences, rationalise, and strategies in an action-situation there is little chance

that these representations well spontaneously converge into a shared vision.[4] Thus, an initial and heuristic step called 'initialisation' is necessary to draft out of different approaches of an acceptable representation of both the total quality and the quality system of the resources. In some ways, the representation of total quality is like a negotiated cognitive convention.

Hence, the tailoring of the quality system directly results from the tailoring of total quality: the richer the definition of total quality is the wider the extent of the quality system (in terms of its geographical extent, the number of stakeholders and the complexity of their interactions). Conversely, an actual quality system encompasses all natural and artificial elements and actors from whom total quality results. Ultimately, the process of patrimonialisation will allow the community of stakeholders to weave together and mobilise a network of effective quality goals management in situations where it was latent or only partially effective before.

The cognitive aspect of building the notion of total quality, i.e. an acceptable representation of the effective quality goal and the quality system is that stakeholders freely and unanimously come to a conclusion about (i) the antinomic character of the actual situation and (ii) their mutual interdependence towards a viable solution beyond which a new solidarity emerges. Ultimately, the quality of consensus will depend upon the actor's commitment and the quality and smoothness of negotiations.

To sum up, total quality is *de jure res nullius* but *de facto* the common good[5] of the community of stakeholders. It should be recognised that any actor has the capacity to take charge of total quality because – due to its circulative and interactive nature – the total quality of water resources goes beyond the sole concerns of public and private property. A new paradigm is needed, the one of trans-appropriativity.

Concept of 'trans-appropriativity'

The total quality of water resources is not managed as such because the issue of quality systems impinges on it at the level of natural, human and artificial entities. It emerges as a result of the circulating and interacting nature of water resources and therefore cannot be appropriated. Because of this trans-appropriative nature, resources are damaged.

We should here emphasise that the concept of trans-appropriativity does not deny the existence of public and private property rights. Indeed, it explicitly takes into account the fugitive nature of total quality, i.e. that which belong to no one and/or that circulates within, across and beyond private and public property. In patrimonial terms, it means a reality, which is non-appropriated, i.e. trans-appropriative. However, construction of the notions of total quality and trans-appropriativity as realities is an insufficient condition for maintaining and improving the total quality of resources. It should be acknowledged that we have neither the judicial nor the economic tools to handle such a reality.

Instead of ignoring reality, it should be recognised as complex. The question is to find a constructive approach that respects each one's liberty, autonomy and ability to negotiate so as to foster common interests. To progress further, it is postulated here that the 'patrimonial approach can be used as a principle of management with a strong identity component and as a legal framework of reference' (Karsenty, 1996). Our proposal is to manage the trans-appropriative character of total quality explicitly under the concept of patrimony.

The concept of patrimony

Patrimony can be defined as 'a set of material and immaterial elements centred on the holder, which led him to maintain and develop his identity and his autonomy through adaptation in space and time to an evolutive world' (Ollagnon, 1999).

The aim of this definition is two-fold. It explicitly enables us to specify the ontological relation, i.e. that which contributes toward defining the nature of being, linking material and immaterial elements to their holder. This type of representation of the links that tie us to the various elements in our environment is, according to its promoter, 'necessary for the management of certain types of resources whose degradation or destruction alters the autonomy and identity of a holder' (Ollagnon, 1979).

Second, the definition makes it clear that there is no patrimony in and of itself (Ollagnon, 1999). In order to constitute a patrimony, we need three interacting elements which are as follows:

a) A patrimonial element (a natural or man-made element such as an aquifer or a river basin, a mammal or a tree specie, an irrigation network, a public policy or an institution)
b) A patrimonial manager and/or a holder who should be identified or designed,
c) A bundle of patrimonial relationships (functional, meta-functional and/or ontological) connecting the above elements.[6]

Thus, the concept of patrimony explicitly integrates the multi-dimensional and complex nature of man in his natural and human milieu, i.e. man in a given historical, ecological, social, cultural and political context, which is much broader and comprehensive than disembodied theories of economics or any other universalist approach. Since patrimoniality offers true negotiability of long-term collective choices, we think it is a powerful stimulus to mobilise actors. Ollagnon (1999) notices that with regard to water, the issue is not whether to share an existing rent, but to generate a common rent, the one of quality. In that respect, the patrimonial approach aims at improving three things:

i) The intrinsic quality of water,
ii) The quality of relationships among stakeholders,
iii) The quality of relationships between actors and their milieu.

The total quality of resources and living systems may become local common patrimonies of general interest (Ollagnon, 1999) as much as the emergence of a real stake, i.e. a local one, becomes the common patrimony of the closest actors before being extended to the farthest actors. This is so, argues Weber (1996), since the despoilment of local actors for external, long-term or global interests is acceptable neither from the ethical, nor practical nor ecological points of view, in fact, non negotiation is both economically costly and, on human terms often grievously damaging.

Three different types of patrimonial holders

There are three types of patrimonial holders who can be distinguished as follows:

a) The 'individual manager and/or holder is a physical person who has got a legal title to (ownership rights *per se*) or other conventionally recognised control of the thing he owns. Thus, he constitutes himself as an action unit, or decision-making unit who has got mastery (the right to exclude others from exercising their rights) on all attributes (access, use and transfer) as a proprietor within the laws ruling private property, in the context of market economy.
b) The collective manager and/or holder is a moral person (a state, a private company, an association) who has got a legal title (ownership rights *per se*) or other conventionally recognised control on the thing it owns. It constitutes itself an action unit, or decision making unit who has got mastery of all attributes as a proprietor within the laws ruling private and public property.
c) The common manager and/or holder' is a group of physical and/or moral persons who *de facto* negotiate their conditional commitment and performance and who co-ordinate themselves in action-situation, so that they constitute quasi-actors. The community-holder is consistent in action-situations only when a problem is to be solved. Therefore, a common manager and/or holder is not *de jure* a rightful claimant under the laws ruling property because their common action results from the commitment of each actor within, across and beyond each one's field of appropriation (Ollagnon, 1999).

From the operational point of view, we should emphasise the difference between collective and common managers or holders. The community of common managers and/or holders is crafted out of the multi-dimensional aspects of the problem itself and emerges as an outcome of the audit, whereas the identity of a collective manager and/or holder is

given as per the laws ruling property. Thus, the definition of a stakeholder community arises from but is not limited to a pragmatic, positive, legitimist and constructivist approach rather than a normative and legalist one. The concern is not what actors are entitled to do according to their rights but what actors can and should do at their level to solve the problem. This functional logic resorts to what judicial anthropology[7] calls informal problematic group, which centre on a problem and are consistent only in action situations.

Lastly, the effective implementation of patrimonial management also requires organisational means such as the following:

- Physical or virtual places to meet, communicate, negotiate and manage (emphasis should be put on negotiation rather than on direct management),
- A reference tool of communication (a meta-language) centred on the problem,
- Procedures of confrontation and negotiation (the quality of confrontations and negotiations should be explicitly taken up in charge as a set of enabling conditions). This is where true participation occurs: is only through negotiations that the concerned parties really commit themselves, get a feeling of belonging to the system taking shape and become truly conscientiousness with regard to the actions taken (Ollagnon, 1979).

The environmental auditor as a realistic visionary

Since the state apparatuses is as much a party in the negotiation process as any other kind of actor and is subject to external influences as well as to its own objectives a patrimonial audit has to be conducted by a professional auditor trained in social and life sciences as well as in communication and negotiation skills.[8]

Unlike an expert, his role does not consist of suggesting operational solutions but of helping those involved in their search for solutions. In order to do this, the auditor should be able to call into question his own conceptions of quality, legitimacy and legality. He therefore, requires certain capabilities such as the ability to listen, to reconstruct opinions and to inform actors about the manner in which the others look at the problem. His intervention will led actors to objectify and codify the terms and conditions for the debate in spite of their different situations.

The appointment of experts in courts may form the basis for the status of an auditor. This may lead to the creation of an independent body of environmental auditors[9] at the national or international level who implement patrimonial audits.

The patrimonial audit: identification – diagnosis – prospects – action

How do actors represent themselves in action-situations what they know, and the multi-actor quality system they belong to? How do they map the problem to be solved? Do they have the space and place to confront their visions?

Broadly speaking, the scope of the patrimonial audit is to work out the problem so as to embody the audit with flesh and spirit. The aim is explicitly to upset the prevailing dichotomy between objective reality, i.e. a scientific but fragmented one, and subjective reality, i.e. actors' overall experiences, which determine their rationality and commitment. Therefore, this approach respects actors as knowledgeable experts since it is assumed that actors know the situation in which they interact. What is the relevant amount of complexity to be computed? What is the relevant process, scientific vs. other types of rationality of computing complexity? From both the operational and methodological point of views, we think one must see an actor's subjectivity[10] and the human brain as a powerful means to complexity. Therein lies the difference between science and strategy. This logically leads to a reversal of the roles of experts and stakeholders. Putting the last first, experts are invited to participate, whereas, it is usually, they who call upon the people to participate (Weber, 1996).

The patrimonial audit *per se* is a clinical intervention, which aims at *identifying* a problem in all its dimensions, including the actors involved and the qualities at stake or the quality system; *diagnosing* actors' past and present commitment (or absence of commitment) into action (i.e. effective quality goal management); *prospecting* outcomes expected in the medium and long-term with scenarios (pessimistic, trend-setting and optimistic); and identifying *action* to be undertaken in terms of levels of quality to be reached, conditions and means to be implemented (institutional, financial, technical, legal and juridical, etc.) and prioritising tasks including incremental reforms.

As developed, this innovative methodology assumes four phases or sequences of investigation which can be used either for semi-structured interviews with informants or for collective negotiations. They can be summarised as follows:

Identification: According to his position and main occupation, the informant is asked to discuss the qualities at stake through the lens of his professional activities/his vision, strategies and objectives/the different scales and nature of constraints he faces/his margins of autonomy/his patterns of interaction with other key actors/the functioning system he belongs to – in sum what makes both the actual quality and action systems.

Diagnosis: The informant is asked to work out the genesis of the problem in its historical perspective (at his own scale as well as lower and higher ones). He may give reference situations, dates, and his own criteria of assessment. He is also asked to describe key actors involved and responsibilities at stake. In a second part, the informant will have to discuss solutions and policies implemented in the past, their main outcomes and explain why they failed (or succeed).

Prospects: According to his understanding of the situation, the informant is asked to propose three alternative scenarios for long-term perspectives[11]: an optimistic one a pessimistic one and one which is most likely to happen. In these scenarios, the informant is supposed to deal with and discuss important issues at stake, allied costs (social, economic, environmental and human costs, etc.), key actors and their roles, including his own commitment (or not) in the action-situation. It is possible, therefore, to initiate a debate on (i) the acceptability and the viability of the actual situation (ii) long-term objectives.

Action: What are the effective means and conditions to be satisfied in the medium term to achieve what is desirable? The informant is asked to be a policy-maker in order to formulate levels of performance to be reached. How shall tasks be procoutesed indicators monitored? Action may include possible reforms and policies in several fields such as technical, institutional, judicial and economical. The informant is asked to define his own commitment to action.

These raw interviews have to be integrated (but not aggregated) by the auditor. The goal of incorporating preferences is replaced by the goal of interaction among preferences (Weber, 1996). One of the difficulties in dealing with raw interviews is that informants seldom follow the IDPA registers in their discourse. Thus, the auditor has to sort out the four elements of response afterwards on his own. Integration will enable the auditioner to pinpoint consensus and conditional commitments as well as dissension among actors that need to be negotiated.

The way the patrimonial approach proceeds with problem solving rests on simple guidelines for the management of common good (Ollagon, 1999):

a) To strengthen the other's identity in order to construct a good contract with him (rather than to alter his identity and limit his autonomy),
b) To built up contractual structures with the possibility or to vulnerable disengagement, in order to foster the engagement/commitment,
c) To incite desire, which guarantees commitment, rather than impose limits, which are intimidating.

The patrimonial approach may encourage actors to negotiate temporary agreements valid for a limited period of time, without any automatic renewal. It may allow an individual to match the offers and demands of an other and to maintain his commitment to participate in negotiation. In such a 'parliament', actors become effective co-suppliers and co-demanders of total quality. We think this methodology can be a tool to design and implement solutions in a legitimate and effective way.

CONCLUSION

The patrimonial approach to managing common property resources assumes the latent existence of a future that would be acceptable to all. We have based our arguments on the hypothesis that only by addressing the unity of humans and their objective subjectivity can we contribute to bettering the 'politics of policy'. This is a humanistic idea and for the sake of realism nature and water resources must become a mark of social interaction to improve general welfare (Ollagnon, 1999). The potential for innovations exists.

A patrimonial co-management of the quality of nature, both appropriative and trans-appropriative, is envisioned today as an operational reality by addressing all the dimensions of quality. But, unlike the conventional system of so called participation, it is only after a negotiated agreement on long-term objectives that the tools to achieve said objective can be selected and the procedures and code of conduct established. In that sense the patrimonial approach is very much concerned with human rights and governance.

Finally, it is surprising to me that people think scientific rationality is a source of justification; they are mistaken in this belief. To progress further, we should look out for the social construction of rationality, identity and patrimony.

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NOTES

[1] Living systems in which human beings are an integral part, no more and no less, of the ecosystem we intend to conserve.

[2] Ollagnon H. (1979) Propositions pour une gestion patrimoniale des eaux souterraines: l'expérience de la nappe phréatique d'Alsace, *Bulletin interministériel pour la rationalisation des choix budgétaire*, No. 36.

[3] These kinds of situation are also refered to as 'social dilemma' or 'collective action problems' in political science. The practical difference between the 'action problems' found in Ollagnon (1979, 1989) and social dilemmas is that in the former case actors do not have an explicit representation of their interdependency in both solving and producing problems whereas, 'social dilemmas' refer to a well-defined set of players who explicitly realise they are mutual interdependent and therefore act accordingly while they attempt (or do not) to solve the problem.

[4] When an attempt is made to confront actors directly along with their current behaviour and ensuing impacts (their responsibilities), their attitude is mostly reactive. They are in a situation where they justify their actions with respect to the attitudes of the other parties concerned. Thus, it is not feasible to reach a consensus at this stage.

[5] A common good defined as a public good (for which the exclusion of free-riders is physically difficult or economically expansive), be it either a pure by public good (out of which individual consumption is not substractible) or an exclusive by public good (Ostrom, Gardner and Walker, 1994) for which consumption is substractible and exclusion problematic, i.e. a common pool resource.

[6] It is now widely accepted that man-nature relations are circumferential or 'man-nature-man'. Nature mediates and supports cross-relations any men with respect to power, economic, or religious issues.

[7] See Le Roy, *et al.* (1996).

[8] Rent-seeking analysis (in both economic and political sciences) and organisational and regulatory economics have shown that the state behaves as an actor with its own representations, preferences, rationality and objectives which command its patterns of action with respect to resources and its patterns of interaction with respect to stakeholders.

[9] Environmental mediators as persons with attested professional success that can guarantee that they do not depend on mediation for survival. They should be provided with thorough theoretical and practical knowledge after which training they should be registered in a list of authorised mediators.

[10] Subjectivity as a person's views proceeding from personal idiosyncrasy, i.e. imaginary, partial and distorded. According to this doctrine, i.e. subjectivism, there is no external or objective truth.

[11] In social terms, we understand long-term to denote a period beyond the present generation, it would thus allow us to establish links with our future.

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THE WATER RESOURCES OF AN ISLAND STATE (JAMAICA): ISSUES RELATED TO ALLOCATION, ACCESSIBILITY, MANAGEMENT AND HUMAN RIGHTS

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ABSTRACT

Water is a fundamental survival need of mankind. In fact, denying people access to water is tantamount to denying them a basic human right. Still, about one billion people around the world do not have access to safe drinking water. In developing countries, especially in small island states, water assumes great importance in sustainable development. Although water is an economic resource, its availability is intrinsically related to the question of affordability by the public at large. This paper examines the issues related to water accessibility, supply, demand, management and governance in the Caribbean island of Jamaica. The development of new water supply schemes in Jamaica is being carried out by a private company, Carib Engineering Corporation Limited, while the distribution of water, maintenance works and minor water supply and sewage systems are the responsibility of the National Water Commission, a public sector organisation. Continued good governance is needed to make water more accessible to the public in Jamaica and in the Caribbean at large. Public and private sector efforts are required to educate the public regarding the misuse of water, the reuse of household wastewater and the recycling of industrial wastewater. A multi-partisan committee consisting of members of the public, community leaders and private and public sector representatives would ensure the free and fair distribution of water, transparency in dealings and the appropriate settlement of disputes at the national level. These initiatives are expected to contribute positively towards the equitable distribution and utilisation of water resources in the Caribbean island states.

INTRODUCTION

Water is one of the most essential elements for the sustenance of life. It is also one of the common properties of mankind on Earth. Three-fourth of the earth is covered with water, yet, paradoxically, water problems exist around the world. Problems related to water assume a number of forms: quantity, quality, sources for new supplies, distribution and allocation.[1] Water is also the element of conflict among and between communities within a nation. Tensions between Egypt and Sudan over the Nile River, among Turkey, Iraq and Syria over the Euphrates River, between Jordan and Israel over the Jordan River, and between

India and Bangladesh over a number of rivers are some of the trouble spots which highlight such disagreements. Conflict arises because the availability of fresh water is affected in such transboundary rivers.

Around the world, over a billion people lack access to adequate supplies of water and close to two billion people suffer from the consequences of poor sanitation. Millions of people, especially children, die each year from drinking contaminated water. There are many claimaints of water, which is limited and, hence, cannot adequately meet the competing claims. In many areas, the lack of water, not land is the main constraints to agricultural production. Urban and industrial needs for water compete with agricultural production needs and as a consequence of increased water abstractions and discharges of wastewater adversely affect the rural poor and ecosystems.[2]

In recent years attempts have been made by many nations including the Caribbean countries to increase the water supply and accessibility in view of increasing population pressure and demands from the productive sectors.

ACCESS TO ADEQUATE AMOUNT OF WATER

Water should be considered as one of the basic human rights. The state has a moral obligation to ensure that its citizens have access to adequate amount of water. Any government who would deny this access would be acting against this right. Consequently, allocation and management of water become critical issues, especially in developing countries. The issues of supply, distribution and management of water need critical evaluation, from moral and ethical perspectives. Therefore, prudent management and sensible allocation becomes an important task.

Because of their size, geology, topography and climatic conditions, small islands have very serious problems related to the availability of water. Owing to their small size, the total volume of rainfall on such islands is small, and most of it is lost to evapo-transpiration and run-off.[3] Water is an important resource for any food system and more importantly for an island. The importance of water as a basic necessity for survival cannot be over emphasised in an island state such as Jamaica. The coastal waters are the recreational grounds of the tourist industry, which is the largest source of foreign exchange earnings (US$ 1,233.0 million in 1999) and a major employer (30,775 persons in 1999).[4] Water forms the basis for the development of vital areas including both agriculture and non-agriculture sectors. The latter entails housing, mining and manufacturing as well as urban and rural settlements. All these areas compete for the 'precious commodity'.

This paper examines the issues of water accessibility, supply, demand, management and allocation in the island state of Jamaica, West Indies, as they relate to basic human rights.

WATER AS A BASIC HUMAN RIGHT

Water is needed for daily necessities as well as for productive purposes. It is required for drinking, cleaning and washing as well as for cultural and religious purposes, health reasons, and food production, which is another basic human needs. Water is also needed in industrial sector, which provide much employment. Since denying people access to water is akin to taking away their dignity, water should be considered to be a basic human right. Water is recognised as critical for sustainable development. Although it is an economic resource, it should not be priced accordingly; rather it should be treated as a human right. Though its linkages, water forms the basis of the development of vital areas including agriculture, housing, mining, and manufacturing. Water of course constitutes the nucleus around which urban settlements throb.

WATER RESOURCES IN SMALL CARIBBEAN ISLANDS

Water resources in the Caribbean region vary from island to island from an abundance of water (Guyana, 7,500 mm rainfall in a year) to meager rainfall (Antigua and Barbuda, 1,500 mm rainfall in a year). The problem of the Caribbean is the complexity of the hydrology of small island states. One of the problems is that on many small islands, most activities are concentrated along coastal areas. The coastlines are often the focus of the tourism industry and house the major population centres. Agricultural activities also tend to be concentrated along the coast. With this complexity of agricultural and human demands, as well as the need to create an environment to attract tourism, it is essential that no activities that bring about the degradation of or a dramatic change in that environment be introduced. Islands such as Antigua and Barbuda, Nevis and Barbados have no rivers and depend solely on rainwater for their water supply. Hence, watershed areas to collect rainwater have assumed great importance in these islands. Other islands

TABLE 1

POPULATION SERVED WITH PUBLIC WATER SUPPLY AND SANITATION IN SELECTED CARIBBEAN COUNTRIES, 1995

	Population, (million Rounded)		Drinking water, % of houses connected		Public sanitation, % of houses connected	
Country	Urban	Rural	Urban	Rural	Urban	Rural
Bahamas	0.3	-	88	86	16	100
Barbadoa	0.1	0.2	98	98	4	98
Belize	0.1	0.1	89	51	44	21
Guyana	0.3	0.5	77	69	27	28
Jamaica	1.4	1.1	57	53	34	65
Trinidad & Tobago	0.9	0.4	90	88	32	92

Source: Idelovitch and Ringskog, 1997

(e.g., Trinidad and Tobago, Jamaica, Grenada, St. Lucia and St. Kitts) derive their water resources mainly from rivers and streams.

Table 1 provides detailed estimates of the level of water service for six Caribbean countries. The service levels reported by the countries are essentially estimates of varying quality. The level of sewerage coverage lags behind the level of water supply service by a wide margin. Wastewater treatment plants are few and far between in almost all countries in the region. Few existing plants are operated properly.

Permanent Secretary in Jamaica's Ministry of Water, Thorant Hardware said, 'We have recognised in the Caribbean that water is going to be a critical element. In Jamaica, we think that we have enough to meet our projected demand certainly up to the year 2015 and beyond, however, this is no reason for complacency'.[5]

WATER RESOURCES IN JAMAICA

Description of the Island

Jamaica is a land of mountains, plateaus and plains with 48 per cent of its area above an elevation of 1,000 feet (303 metres) and 15 per cent above 2,000 feet (606 metres). The eastern part of the island is composed of metamorphic rocks that form the Blue Mountain Range, whose highest point reaches an elevation of 7,402 feet (2,243 metres). To give an idea about the country some of Jamaica's economic indicators have been presented in table 2.

Water sources

Rainfall is the only source of water for the island of Jamaica. It yields the three basic water resource types: direct rainwater, surface water and groundwater. The majority of Jamaica's water supply, whether useable or not is collected in natural basins dispersed throughout

TABLE 2
SELECTED ECONOMIC INDICATORS OF JAMAICA, 1996-1999

Indicators	1996	1997	1998	1999
Real GDP growth (%)	-1.3	-2.8	-3.8	-1.2
Consumer price inflation (year-end)	15.7	9.2	25.2	21.9
Merchandise exports fob (US$m)	1,721	1,704	1,653	1,694
Merchandise imports fob (US$m)	2,674	2,914	2,827	2,714
Current-account balance (US$m)	-295	-497	-358	-50
Exchange rate (year-end; J$:US$)	34.9	36.1	38.2	42.1
Access to safe water (%)	81.7	81.2	81.2	81.2
Provision of sanitary Facilities (%)	99.7	99.5	99.5	99.5

Source: Economist Intelligence Unit, 2000

the island. Jamaica is divided into ten such hydrological basins, most of which are divided by surface water although there are some cases of groundwater division particularly in areas of karstic limestone outcrops.

Reliable surface water and groundwater yields a total of 4,084 MCM (million cubic metres)/year. Island-wide water use is estimated at 916 MCM/year (22 per cent) and the remaining 3,197 MCM/year (78 per cent) is available for development. The bulk of this available water resource potential (81 per cent) is groundwater.[6] In Jamaica, aquifers outcrop over 59 per cent of the island's land surface and groundwater accounts for 84 per cent of the available freshwater resources.[7] This greater abundance of groundwater makes it fundamentally important to life and economic activity on the island. Generally, groundwater is abstracted by pumping wells; there are estimated 500 such wells in Jamaica. Groundwater has several advantages over surfacewater as a source of potable water:

- The capital cost of developing groundwater for supplies is ordinarily less;
- Its natural quality is generally adequate for human consumption without extensive treatment;
- Groundwater has a wide spatial distribution and is not easily polluted;
- Its supply systems have a lower maintenance cost; and
- Groundwater is less affected by drought and is regarded as a safe strategic reserve of potable water in the case of natural disasters.

Many large rivers flow from the Blue Mountain Range. Much of the island is largely limestone a central ridge with many spurs running from north to south. These numerous ridges, from which various river drainage systems haves developed constitute the island's watershed areas. To date, the National Resources Conservation Authority (NRCA) has identified 22 critical watersheds areas.[8] These watersheds provide the majority of water for domestic use within the upland regions of Jamaica.

The water balance for Jamaica is presented in table 3, it showing that the total rainfall over the island is equal to the sum of evapo-transpiration, surface run-off and groundwater discharge. The table also shows the total exploitable water resources and their future utilisation. The exploitable surfacewater run off or reliable yield is defined as the daily water flow that is exceeded 90 per cent of the time. This level of reliability is sufficient for irrigation, but domestic and industrial water supplies usually need a higher level of reliability.

Present water supply

Present water supplies are taken at 1985 levels. They are mostly estimates since many supply systems lack measuring and recording instruments. Table 3 shows the estimated quantities of water supplied to the main sectors in each basin. Tourism is included in the

domestic urban sector. According to table 4, the present supply totals 870 MCM/year, of which about 74 per cent goes to agriculture and 26 per cent is supplied to domestic and private industrial consumers.

Some initiatives to increase water supplies

To support the execution of policies programmes and general activities in the water sector, a budgetary allocation of J$ 607.4 million was made to the sector in the 1999/2000 budget, an increase of J$ 293.3 million over the 1998/99 revised budget estimate.[9] This funding facilitated the completion and continuation of work on a number of projects. By the end of December 1999, work on Bowden/Port Morant/Pear Tree; Lambs River; Old England/New Hall; and Strickland Water Supply Schemes, was complete, and work on a number of other projects, which aimed to improve water supplies in tourist resort areas as well as in some rural areas continued. In 2001, the National Water Commission awarded a contract of US$ 85.0 million to a private firm to bring a greater volume and more efficient water supply to sections of the parish of St. Catherine. The project will see an improved and more efficient water supply flowing into Greater Spanish Town and the Greater Portmore area and serving

TABLE 3
SUMMARY OF WATER AND PRESENT AND PROJECTED WATER USE

Water balance	MCM/Year	
Evapo-transpiration	11,985	57%
Surface water runoff	5,576	26%
Groundwater discharge	3,691	17%
Rainfall	21,212	100%

Water use	Present MCM/Year	Projected MCM/Year
Non-agriculture sector	231	346
Agricultural	682	1,338
Total	913	1,684

Exploitable water resource	MCM/Year
Exploitable surface water	666*
Runoff (reliable yield)	3,419**
Exploitable groundwater (safe yield)	4,085

Source: Underground Water Authority, 1990

* 12 per cent of the total surface water run-off

** 92 per cent of the total groundwater discharge

about 300,000 people out of 950,000 people.[10] This plan calls for the rehabilitation of wells and infrastructure, new pipelines, the installation of bulk flow to monitor and control unaccounted for water flows, the development of water resources and the institutional strengthening of National Water Commission to improve its management capabilities.

Water consumption

Consumption patterns for water in Jamaica shows imbalances not only among the various sectors using water but also between rural areas and the main urban area, Kingston metropolitan. Domestic and private use consumes large volumes of water per annum, particularly in Kingston metropolitan, where 80 per cent of water is consumed for this

TABLE 4
WATER USE AND FUTURE WATER DEMANDS IN THE 10 BASINS AND IN THE PARISHES OF JAMAICA

		Agricultural sector			
Basins	**Non-Agricultural sector Parishes**	**Present Supply**	**Expected demand**	**Present supply**	**Expected demand**
Blue mountain	St. Thomas	3.62	7.30	11.20	60.50
South	St. Andrew	0.16	0.60	1.00	1.00
Kingston	Kingston & St. Andrew	72.30	113.00	2.00	2.00
	St. Thomas	0.01	0.06	-	-
Rio Cobre	St. Catherine	44.70	57.55	259.80	391.00
	St. Andrew	0.17	1.05	-	-
Rio Minho	Clarendon	25.40	32.40	329.0	580.00
	Manchester	13.80	17.70	-	2.00
Black River	St. Elizabeth	6.23	9.20	31.50	146.30
	Manchester	-	0.40	-	-
	Trelawny	0.14	0.55	-	-
Cabarita River	Westmoreland	9.70	14.60	23.50	84.00
	Hanover	1.08	1.40	-	-
	St. Elizabeth	0.01	0.4	-	-
Great River	St. James & Hanover	25.58	40.68	2.20	2.00
	Westmoreland	0.02	1.01	-	-
Martha Brae	Trelawny	7.58	10.20	0.0	26.0
River	St. James	0.83	2.00	-	-
Dry Harbour	Trelawny	0.56	1.16	2.20	
mountains	St. Ann	7.58	16.77	9.30	10.00
	Manchester	0.52	1.07	-	-
Blue mountain	St. Mary	5.93	8.00	10.00	27.00
North	Portland	5.18	8.10	2.00	3.70
	St. Andrew	0.40	0.60	-	-

Source: Underground Water Authority, 1990

TABLE 5
JAMAICA'S WATER CONSUMPTION BY VARIOUS SECTORS, 1999

Sector	Average water consumption (mgd)*	Annual water used (mg)*
Agriculture	540.0	135,000
Domestic	97.50	30,000
Industrial	23.65	8,632.25
Total	661.15	173,632.25

* Based on calculations from figures supplies by the Water Resources Authority, National Water Commission and Ministry of Agriculture, November 2000.

purpose. An average demand of 97 million gallon per day was registered in 1999 (table 5). Rural areas show an average consumption of 38.8 million gallons per day this figure includes small industries and informal irrigation as well as domestic and private use.

Approximately 38 per cent of the rural population of Jamaica has piped water; another 48 per cent having access to standpipes.[11] The present water use of the non-agriculture sector, comprising both urban and rural domestic use as well as use by, tourism and industries is estimated at 227 MCM/year. Demand is expected to increase over the planning period (to the year 2015) to 1,388 MCM/year in the agricultural sector and 344 MCM/year in the non-agricultural sector.[12]

Water demand

The distribution of water demand in Jamaica is based on the locations of irrigated lands, population concentrations and water-consuming industries. Table 6 gives an overall breakdown of water demands for the island.

Agriculture

Agriculture is the sector with the largest demand for water exploits 77 per cent of the island's supply. Irrigation is by far the major and most important use of water in Jamaica,

TABLE 6
PRESENT AND FUTURE WATER DEMAND IN JAMAICA BY SECTOR

Sector	Present		Year 2000		Year 2015	
	MCM/yr	Per cent	MCM/yr	Per cent	MCM/yer	Per cent
Agriculture	760	76.7	1,149	80.0	1,338	79.5
Domestic rural	21	2.1	46	3.2	62	3.7
Domestic urban	138	13.9	161	11.2	181	10.7
Tourism	10	1.0	15	1.0	23	1.4
Industrial	62	6.3	66	4.6	80	4.7
Total	991	100	1,437	100	1,684	100

Source: Underground Water Authority, 1990

especially on the southern coastal plain of St. Catherine and Clarendon. Sugarcane is a major user of irrigation water. It is estimated that some 36,100 hectares of land are nationally commanded by irrigation systems in these two areas. In the year 2000, the target of 64,700 hectares land under irrigation was achieved. It is also in these areas that the major lowlands of the island as well as its greatest agricultural potentials are located.[13] Because of the minimal rainfall level in the south, as little as below 30 inches, these southern regions suffer from extensive dry periods. This precipitates the need for transporting water via irrigation systems to where it is most needed. To date there are some 40,000 hectares of agricultural land under irrigation; each acre requires an average of 6,000 imperial gallons of water each day. This sector, therefore, uses about 135 billion gallons of water annually. In 1997, the government of Jamaica, through the National Irrigation Commission, prepared a National Irrigation Development Plan.[14] Which proposed a policy strategy and development plan to mitigate the above problems. Phase 1 of the Master Plan prepared assessed the current and potential state of the irrigated agricultural sector and the constraints and deficiencies facing the sector.

Domestic sector

At present, the domestic sector accounts for 69 per cent of the non-agricultural water demands and 16 per cent of the island's total demands. This figure is projected to increase to slightly more than 70 per cent by the year 2015. Urban consumption accounts for 87 per cent of the domestic demand while rural demands make up 13 per cent; the estimated increase for 2015 places these figures at 74 and 26 per cent respectively. The majority of urban water demands are satisfied through public water supply systems.

Tourism

Tourism is another important sub division of non-agricultural demands, it constitutes one per cent of the island's total demand. The water requirement for tourism is assessed on the basis of the number of rooms available and the unit demand per room. Tourist water use on a per capita per day basis tends to be higher than domestic use. According to the United Nations figures, tourists in Barbados use 500 litres per capita per day while the values for Dominica and St. Lucia are 300 and 460 litres respectively.[15] These figures are relatively large due to the high standard of accommodation and the presence of swimming pools.[16] The Jamaica Tourist Board and the Town Planning appraised the total number of hotel rooms as 14,502 in 1996; 15,094 in 1997; 16,200 in 1999; the number may increase to 33,030 in 2015. The total number of rooms including guest houses, resort villas and apartments, was 21,984 in 1996 and 22,945 in 1997. The National Water Commission (NWC) estimates the yearly demand for these rooms as 11.7 cubic metres/year. Montego Bay the 'real' centre of the tourism industry uses a high portion of the tourism water

demand to cater to its thriving tourist industry. Its annual demand is appraised at 21.1 MCM/year, with 3.1 MCM/year for tourism alone. The present supply capacity totalling 31.1 MCM/year already exceeds the demand. The Ministry of Agriculture expects the demand to rise to about 39.1 MCM/year. If present supplies remain stagnant, Montego Bay will be unable to meet the demand by 8.0 MCM/year. The economy of the north depends largely on the tourist industry, which requires less water than manufacturing industries.

Industrial sector

The industrial area uses about six per cent of the island's water supply. Within corporate areas,[17] roughly nine million gallons of water is consumed daily, totalling some 3,125 million gallons annually. This is provided by the NWC and used by manufacturing industries. In rural areas, industries are confined mainly to mining particularly the bauxite/aluminium industry, which uses large quantities of water in its bauxite to alumina conversion process. There are three major bauxite/aluminium industries in Jamaica two alumina producing plants, the ALCAN (Aluminium Company of Canada) and ALPART (Aluminium Partners of Jamaica) and one bauxite mining company, Kaiser Bauxite Company Limited. Primary alumina production alone generated 14.7 million tonnes of mineral while with total bauxite production accumulated 10,857.50 tones in 1995. These figures give evidence to the large quantity of water needed to produce these outputs on a yearly basis.

Water management

Management of water resources in Jamaica is carried out by private and public sector organisations. The Carib Engineering Corporation Limited is entrusted with the responsibility for the development of major new water supply schemes, while the distribution of water to various sectors (industrial, residential, tourism), maintenance works and minor water supply and sewage systems are carried out by the NWC.[18] The Water Resources Authority (WRA) is responsible for monitoring and managing the country's surface and groundwater resources and for licensing groundwater abstraction. The WRA oversees overall water resource development, including policy recommendations to the government. The Urban Development Corporation (UDC) manages some water resources for its development areas. The Natural Resources Conservation Authority (NRCA) has the broad responsibility of managing the country's natural resources, including its water resources. It also provides policy guidance on the suitability and exploitability of water resources. The Planning Institute of Jamaica (PIOJ) is entrusted with coordinating of water policies, developing of projects and supporting water resources management. Parish councils also handle some water distribution in small towns and rural communities. Water bills are payable at banks or at water commission offices.

The irrigation management of Taiwan, a small island state, is often cited as a good example of efficiency in service delivery paid for by satisfied water users, largely small rice farmers. There is an elaborate organisational structure and a very detailed system of planning for the timing, volume, distribution and use of irrigation water characteristics, which are often used to explain good performance.[19] However, the model is neither suitable nor relevant for Jamaica or other Caribbean islands as rice is not grown commercially on these islands.

Water policy of the Jamaican government

In order to provide strategic direction to the sector. The government of Jamaica developed its water sector policy in 1998 with inputs from stakeholders. Important components of the policy include coverage; social water; tariff; institutional strengthening; protection of the watershed and related environmental issues; and water resources management and conservation.[20] The policy is expected to boost the capability of the water sector and to support various government initiatives.

ISSUES RELATED TO HUMAN RIGHTS, EQUITY AND GOVERNANCE

The basic premises of human rights dictate equity and good governance. Governance related to the allocation and utilisation of water resources at national and international levels need to be rational and transparent. In Jamaica, as with other Caribbean islands, watersheds and groundwater are controlled by government and semi-government agencies. Often the political party in power favours the distribution of water to its supporters' the result is by public outrage and demonstrations. A large volume of water is required by large plantations by the industrial sector and by the tourism sector, mainly hotels, guest houses and restaurants. The tourist industry is expanding in the Caribbean islands, so its demands for more water will increase in the future. At present people cannot dig wells in their backyard to tap groundwater without permission from the government because of the fear of possible contamination. People are often denied access to water based on their political beliefs, a situation, which violates their basic human rights and creates inequity. It is necessary to set up a multi partisan committee consisting of members of the public, community leaders, representatives from both the private sector and public sectors in each affected country. This is one way to ensure equity in water distribution and access.

In contrast, where water flows through several countries, consensus on water allocation and distribution must be reached among the affected countries. A commission comprising member countries, representatives from United Nations bodies such as the Food and Agricultural Organisation (FAO), representatives from Global Water Partnership (GWP) and World Water Council (WWC) needs to be set up. The commission needs to be rigorously non-political in order to guarantee its integrity. Countries have to be represented

equally to avoid any possible rule of power or any violation of the basic human right of access to water. The presence of UN members should ensure equity in the water allocation to each country. Such a commission could act like Centro d el Agua del Tropico Humedo para America Latina y el Caribe or CATHALAC. Based in Panama in 1992, this centre was established to facilitate cooperation and co-ordination in research among countries in the humid tropics.[21] This committee should also oversee water distribution to member countries. In both areas, good governance is of the utmost importance. The committee should seek to encourage co-operation among its members in developing research and development including new technologies related to water purification, distribution and storage. Water resource development programmes need to be integrated into Global Water Partnership for them to be effective. This is particularly important for countries engaged water disputes over a river flowing through a number of countries.

Conservation and recycling of water

One of the most obvious ways of extending the water resource base is by conserving water or by recycling it after use. However, this task is not easy to achieve. People resort to conservation mechanisms only when there is general shortage of commodity. Proposals have been made about conserving water by improving the efficiency of its use in irrigation and reducing the losses in urban water systems. Increasing water use efficiency in agriculture is a difficult concept since it involves a number of variables. Price and other economic incentives will be required to conserve water and increase the efficiency of its use.[22]

A more feasible option is to treat household/industrial/tourism wastewater and use it for non-household purposes like irrigation. Several water treatment methods, including screening, sedimentation, aeration, filtration and disinfectant, are available for and relevant to small communities at the village or small urban level. They have been discussed in details.[23] Idellllovitch and Ringskog (1997) for example, have described some wastewater treatment methods suited to Latin America.[24] In addition, research has shown that duckweed-based systems can provide a solution to the problems of wastewater treatment.[25] Such systems remove, by bio-accumulation, as much as 99 per cent of the nutrients and dissolved solids contained in wastewater.[26] However, it is often not economical to reduce losses in urban water systems, where the appropriate pricing and valuation of water itself is the major issue. Conservation for its own sake is not a realistic or advisable goal; it only makes sense within a correct pricing policy for water.[27]

Water pricing

The question of water pricing deserves very careful consideration. Pricing can serve as an important instrument of policy to further a number of government objectives and to allocate scarce resources efficiently. Recovery of project costs, especially for funds that are

borrowed, is the primary and immediate objective of selling water. If the price is too low, people will bend to abuse water, while a price too high will deny the poor their rights to access to water. There are many examples of the problems that arise from undervaluing water.[28] Water price levels can have a positive impact on water use and do much to encourage water conservation.[29] Hence a balance between the two needs to be maintained.

Pricing structures must be appropriate for meeting the goals and needs of a water utility and the population it serves. In areas where water is plentiful and easy to obtain, low-income families might be required to pay only a flat fee, which would generally cover operation and maintenance expenditures. In water-short islands, high progressive tariffs may be required, with low fees for basic consumption sharply increasing with greater use.[30] A formula needs to be devised whereby the daily minimum amount required for an individual (say 100 litres per day) will be offered at an affordable rate and any consumption above this amount could be billed at a progressively increasing rate. Such an arrangement is likely to guarantee that the basic human need for water is met. It will also provide investors with the incentive to upgrade and expand their facilities.

In rural and some peri-urban areas, it is often not practical to expect consumers to pay for water on a volumetric basis. It may be appropriate to levy a fixed charge per household to cover the costs of communal systems, such as standpoints or handpumps. Water pricing is not a task to be left solely to economists. Its political, legal, and social dimensions are extremely important together they emphasise the need for a 'political economy' of water pricing.[31]

Water financing

In order to sustain water supply systems, it is essential to identify sources of water financing. Both private and public sector cooperation and collaboration are necessary for this purpose. A number of schemes in which the private sector finances, builds, and operates water production and distribution facilities exist. One common designation is BOOT, which stands for build, own, operate and transfer schemes. Under a BOOT contract, a firm or a consortium of firms finances, builds, and operates a plant. The private sector retains ownership of the facility throughout the operations period and is allowed to charge a tariff sufficient to recover its investment. At the end of the operations stage, the facility is transferred to the government, free of charge and in good operating order.[32] A variation is a B-O-O (build, own, and operate) contract, in which private ownership is retained indefinitely. Other variations include BOL schemes, in which a private firm builds a project with government financing but then stays on to operate the plant while paying an annual lease fee. The main objectives for introducing BOOT contracts to water production and supply and management schemes are to make the operation and management of the plant more efficient; to attract new ideas and technologies, which could lower costs, and to finance

the investment without public guarantees in any form. These schemes have their merits and demerits but the bottom line is that without private sector involvement, the water resources of many countries could not develop. Ultimately, public sector participation is essential for continued service. In the Jamaican context, such private initiatives are presently non-existent because of the government has claused complete control over water in order to maintain its quality.

Community involvement

Community groups and other non-government organisations (NGOs) also have an important role to play in supplying water and sanitation services and collecting of waste. The World Bank cited examples of the successful implementation of waste disposal and sanitation projects in Brazil and in Pakistan through community participation.[33] These projects show that on the urban fringe the most productive relationship between community groups and the formal sector is that of partnership. The formal sector in responsible for the 'external' or 'trunk' infrastructure and the community pays to provide, and manage the 'internal' or 'feeder' infrastructure. To give consumers a voice in the political process, consumers' associations and ratepayers' boards are vital. It is envisaged that in a rural community, a water committee or water users' organisation will take responsibility for collecting fees as well as for operating and managing a water facility if it is to function properly. Only if a community has a stake in a project and can perceive the benefits from it, will it, willingly pay the costs of operation and maintenance. In cases where a governmental agency of a NGO has provided a community with seed money for a water project, it is the responsibility of the community to replenish the fund using monthly repayments from users. It might also undertake to expand the project or construct new system. Close collaboration is maintained between the government of Jamaica and the surrounding communities in order to protect the various watersheds in the island. Community participation in water resource management and allocation is at the pilot stage in several rural areas.

Moral and ethical issues

Table 1 demonstrates that within each Caribbean country there is a difference between the water and sanitary facilities available to rural areas and those available to urban areas. This unequal access to public water and sewerage has implications for public health as well as for the human suffering that result from high morbidity. The poor are more likely to have lower levels of sanitary education as well and the result is a still higher incidence of water-related diseases.[34]

The first priority of any water management policy is to ensure that the entire population has an adequate and safe water supply for basic needs such as drinking, cooking

and personal hygiene and that the water provided is free of harmful concentrations of chemical, bacteriological and biological substances.[35] In Jamaica, there is enough water in underground reservoirs to meet the demand of the country. The main constraint for a developing country like Jamaica is access to capital. While outside borrowing is an option, it is not easy for Jamaica to repay a loan with interest. Capital is needed for surveying, drilling, pumping, storage and piping. The other problem is the matter of inaccessible areas. Jamaica's topography is hilly in general the average attitude ranging from 500 to 5000 feet or 170-1700 metres in habitable areas and a number of rural settlements are located in hilly areas. People who do not have much economic or political clout populate these areas. The issues of equity and human rights need to be well considered to mitigate the suffering of the public. Focus on the total water resources should be treated as a secondary matter.

The issue of the human right to access water by a segment of population is complicated by the fact that in an island state such as Jamaica, tourism is the largest foreign exchange earner (US$ 1.2 billion in 1999). Consequently, the tourism sector receives priority in any additional water supply programme. The issue of providing water to the tourism sector sometimes at the expense of politically and economically weak segments of the public raises moral and ethical challenges that needs to be addressed equitably. Only good governance can resolve a situation like this in a satisfactory manner.

SOME STRATEGIC OPTIONS

The following strategies are suggested to improve the status of the water resources of Jamaica and other similar small island states in the tropics.

- For a national government it is essential to formulate policies to safeguard the interests of the common people and ensure their access to water resources. Any policy on water resources must be structured so that its goals are consistent with the national objective to improve the social and economic welfare of the people in the country. As with any other common property issues, governments must develop proper policies regarding the use, distribution, allocation and management of water. Thus, one of the polices of good governance practices is to attain the widest possible distribution of water to the people within a reasonable time and within reasonable cost constraints. This goal should be complemented by the development of good practices with respect to the management, preservation and rehabilitation of water. The water policy of the government of Jamaica is perhaps a step in the right direction. The government, in conjunction with the private sector, should also embark on an educational programme on water to ensure its proper use understanding and appreciation by people and thus, to prevent its abuse. All these steps are expected

to ensure the accessibility of water to the people as a part of the basic human rights.

- A partial solution to the water problem is recycling. Both public and private sectors should share the responsibility to ensure that wastewater is treated properly for reuse. They need to persuade the tourist industry to treat their wastewater for household as well as irrigation purposes. Recent developments in anaerobic technology as well as of aquatic weeds such as duckweed make it technically and economically possible to convert household wastewater (bath water, water from washings) into productive use. Government policy needs to ensure that the industries also follow suit.
- More private sector involvement in the operation of water, sewerage, and solid waste companies is warranted. The concepts of BOOT and BOO may be relevant in a number of instances, especially in providing sanitary facilities and wastewater treatment systems. The concept has worked in developing countries in South America and perhaps it can be redesigned to meet the needs of island states.
- Water resource management strategy should take cognisance of such factors as the allocation of resources and pollution control as well as ensure adequate funding.
- Developing countries including the island states of the Caribbean, need to form an alliance with international water bodies such as GSP and WWC for their own benefit. This will enable them to address complex issues involving public health, the environment, air/sea interaction, integrated urban water management, water resource management, information and technology transfer and small island hydrology. Small islands such as Jamaica need to link and liaise with regional organisations such as CATHALACL so that specific areas of special interest to them are addressed. This is essential especially to strengthen the research and development sector so it can more effectively tackle the problems of water purification, distribution, storage, and conservation of watersheds. All these suggestions, stemming from an examination of Jamaica should serve as a guideline for other developing countries, especially other small island states.

CONCLUSIONS

Water is an integral part of human life and sustainable development. As such, accessibility to water should be considered a basic human right. An examination of water resources in Jamaica reveals that the country has enough water resources to meet its present and future demands. However the present supply cannot meet the full demand of the population due mainly to lack of adequate capital resources. Fear of contamination prevents the government from allowing the private sector to exploit the readily available groundwater. Current water supply, demand, allocation and pricing are at an acceptable level. This has been possible due to good management practices and governance. Future strategies to

improve the water supply should include the formulation of proper policies to safeguard the use, distribution and allocation of water, leasing with international bodies such as WWC and GWP, and strengthening the research and development sector.

NOTES

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2 Solving the Water Crisis Together: The Global Water Partnership', *Environmental Matters: Toward Environmentally and Socially Sustainable Development,* winter/spring 1997, p.10.
3 United Nations (1992), p.2.
4 Planning Institute of Jamaica (2000), p. 15.1.
5 *The Daily Observer,* February 7, 2000, p.31.
6 Underground Water Authority (UWA), Water Resources Development Master Plan, Water Resources Agency of Jamaica, Kingston, Jamaica, Final Report, Main Volume, March 1990, pp.2-1.
7 *The Gleaner,* March 25, 1998, p. B4
8 Natural Resources Conservation Authority and Ministry of Environment and Housing, 1998.
9 Economic and Social Survey Jamaica 1999, *op. cit.,* p. 13.3
10 *The Gleaner*, January 13, 2001, p. B11
11 Lawson and Earle (1977), p.5.
12 Water Resources Development Master Plan (UWA), *op. cit.,* pp. 2-1.
13 Afroz (1998), p. 10.
14 The Planning Institute of Jamaica (1998), p. 7.3.
15 Water Resources Management Techniques for Small Islands (UN). *op. cit.,* p. 13.
16 Goodwin (1984), pp. 64-68
17 Corporate city areas include the capital Kingston as well as the adjacent towns of Portmore and Spanish Town. All three have a combined population of 1.5 million.
18 Water Resources Development Master Plan (UWA), *op. cit.,* pp. 3-9.
19 The World Bank (1993), p. 117.
20 'Economic and Social Survey Jamaica 1999', *op.cit.,* p.13.3
21 *The Daily Observer,* February 7, 1999, p.31.
22 Moigne, Subramanian, Xie and Giltner (1994), p. 22.
23 Water Resources Management Techniques for Small Islands (UN), *op.cit.,* pp. 63-67.
24 Idelovitch and Ringskog *(*1997), pp. 20-25.
25 Skillicorn, Spira and Journey (1993), p. 49.
26 *Ibid.,* p.50.
27 Rogers (1992), p.14.
28 Rogers (1986).
29 Frederiksen, Berkoff and Barber (1993), p.83.
30 Water Resources Management Techniques for Small Islands (UN), *op.cit.,* p.35.

[31] Peter Rogers, *op. cit.*, p. 11.

[32] Emanuel Idelvitch and Klas Ringskog, *op. cit.*, p. 37

[33] World Development Report (1992), pp. 107-109.

[34] Idelovitch and Ringskog, *op. cit.* p.11.

[35] 'Water Resource Management Techniques for Small Islands (UN)', *op. cit.*, p. 27.

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IRRIGATION PROJECTS AND THE EGYPTIAN BEDOUIN

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ABSTRACT

The Sainai desert is habitation of indigenous Bedouin population. With a loan from the World Bank the Egyptian Government planned the northern Sinai Agricultural Development Project (NSADP). This project however faced a major problem in integrating the Bedouin in the project. An environmental impact assessment of the project was done ignored by the government. Using this report, this paper discusses the social impacts of the project on the Bedouins of North Sinai. Project planners failed to look at some of shortcomings which are discussed. The root cause of the anticipated social and political unrests is enumerated. Lastly, some alternatives and preventive measures are recommended.

THE LAWS GOVERNING LAND OWNERSHIP[1]

Customary laws

A distinctive feature of North Sinai is the important role of customary law which has a highly developed and complex structure and process. It is an unwritten law based around the meeting of tribal or clan heads and elders. Each tribe specialises in an area of customary law and is thus most qualified to judge in specific types of disputes, e.g. land ownership, criminal, religious.

All the land in North Sinai is divided among the various Bedouin tribes according to long established tradition and customary law. Each tribe has clearly defined boundaries known to all other tribes. Some tribes share land with others. Boundaries are marked,

1. *The following section up to the discussion is extracted from the World Bank/Arab Republic of Egypt (1992a): Northern Sinai Agricultural Development Project: Environmental Impact Assessment (EIA), Volume I - Main Report. Prepared by Euroconsult (Arnhem, the Netherlands) in association with Pacer and Darwish engineers (Cairo, Egypt) according to the World Bank's environmental assessment procedures (Operational Directive 0D4.00). The socio-economic component of the EIA was subcontracted to North South Consultants Exchange and executed by engineer Zohra Merabet and her team of sociologists and interviewers. Fieldwork took place from August 1st to September 31, 1991. The study was financed by the Japanese Technical Assistance Trust Fund for the Environment. The EIA concluded that, without adaptations the overall impact of the project will be strongly negative. The first policy step recommended was that the NSADP plan and project designs should be reconsidered.*

usually by trees, stones or metal posts. Grazing land is open to all within the tribe, and also possible to cross into other tribal lands for grazing purposes with permission. As water is a scarce resource there are also rules and practices concerning access to water.

Civil law

North Sinai is classified as a desert governorate and as such is governed under specific laws including Law no. 148, which relates to land and water rights. It provides for recognition of original land ownership and for compensation, under certain conditions, of lands whose expropriation may be necessary. However, Article 2 states that only legally used or cultivated desert land is considered private property, the conditions for proprietorship being legal title of land, or desert land being dug or reclaimed or cultivated for at least one full year before issue of law 124 (1958). Rain-fed irrigated land is not considered as reclaimed.

In 1987, the North Sinai Governorate issued a decree offering land title to anybody in the region who had worked in the land continuously for three years or more. However, due to the administrative process registration has so far been largely unsuccessful.

Thus it can be concluded that it is unlikely that the customary land rights of the local Bedouin will be respected, and equally unlikely that they will receive any compensation under Law no. 148. The law in turn, being designed only to protect government planned reclamation and irrigation-crop farmers. No rights to grazing land, livestock production enterprises, rain-fed cropping enterprises and self-motivated local land reclamation (outside government schemes) appear to be respected by this law.

FIGURE 1
THE NSADP PLAN

Map Legend:

Block 1: Tina Plain Zone	50,000 Fed.
Block 2: South Eastern Kantara Zone	75,000 Fed.
Block 3: Raban Zone	70,000 Fed.
Block 4: Bir El-Abd Zone	70,000 Fed.

Source: Egyptian Ministry of Public Work

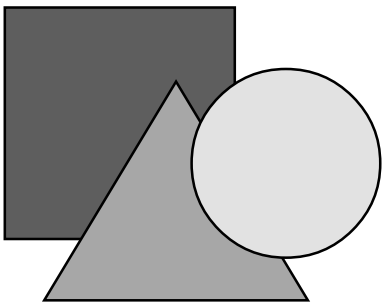

TABLE 1
***NSADP* LAND ALLOCATION AND PLANNED PLOT SIZED PER SETTLER CATEGORY**

Settler Type	% of project land allocated	% of population in project area	Size of plots allocated (feddan)	Type of soil	No. of farms on plots
Investors	52	7	20.0	Sand sheet	1701,305
			80.0	Deep sand	
Small Holders	23	43	4.5 -5.2	Clay/Loam	7,6501,610
			5.0	Sand sheet	
Graduates	15	20	10.0	Sand sheet	7103,705
			6.6	Deep sand	
Bedouin	10	30	3.3	Deep sand	6,470

Blocks 3 and 4, with most of the settled Bedouin, will not be fully developed, i.e. construction of full irrigation distribution network, until well after the developments of Blocks 1 and 2.

SETTLEMENT PATTERN AND INTEGRATION

The tribal Bedouin will be scattered over blocks 2, 3 and 4 (figure 1) mainly concentrated in Block 2 in one village (16) and in Block 4 in mixed village (26). The Bedouin are viewed as having questionable farming skills.

On the basis of this assumption, and their lack of experience with cattle, Bedouins will not be involved in the main livestock activities of the project. Instead they have been designated as being the labour pool for the other settlers who have been allocated larger farm plots. This implies that they are only marginally integrated into the agricultural production process of the project plan. Moreover, their farming plots (3.3 feddan) are the smallest (table 1).

SOCIO-CULTURAL IMPACTS OF THE NSADP ON LOCAL POPULATION

Impacts due to project location

Land rights and social unrest (secondary negative impact): As the equity of land allocation in the project is far from favourable for the local Bedouin, conflicts are likely to arise. It is expected that local protest will have a major impact on the project if it is developed without giving the local owners first choice of land; without accommodating legal respect for rights to grazing land, rain-fed cropping areas, traditional water sources; and without allowing the already developed farms (drip irrigation and date groves) to stay where they are. Moreover, it seems that most of the indigenous people currently utilising the project area for livestock raising and top drip irrigation and rain-fed agriculture would lose their land and have to be resettled in other areas.

Cultural impact (secondary negative impact): Placement of the project within areas encompassed by the differing cultural and customary laws of the Bedouin people will have a major impact. There are high chances of conflicts between new settlers from the Nile valley (who know nothing of Bedouin culture and law) and the local Bedouins (particularly if the new settlers displace existing Bedouins from their land). In addition, it may have a large impact on current livestock management, due to the disruption of the current traditional grazing practices. This would be a result of settlers' unawareness of Bedouin customary law, for instance: keeping a distance from women engaged in shepherding.

Economic impacts (secondary negative impact): A likely large negative socio-economic impact is expected as a result of placing a large government-run project, with the input of many 'outsiders' (including richer investors), into a small economy that is currently supporting the development of the Bedouin people. The Bedouin may lose their local markets, and control of the marketing system to the outsiders and government marketing officials. They may also lose their grazing lands, rain-fed cropping areas and access to the best potential agricultural areas in the process.

Impacts due to project design

Land registration (positive impact): Registration of land will only become applicable once the project is in operation. The level of land registration of the locals is minimal at present and the planning and design of the NSADP will compel the Bedouin to register their existing and any newly gained plots of land. Under existing legislation, land title is likely to be granted under the 'three year working the land' provision in North Sinai Registration laws. However registration may become more complicated during the operation of the project, as the status of this law may change or become null and void as new settlers begin land reclamation. As the legal situation regarding Bedouin land ownership in NSADP is unclear, the likelihood of successful land registration and ownership claims is unknown. The impacts will be highly positive for locals in the design stage.

Settlement of nomadic tribes (positive impact): The project will have a highly positive impact with regard to the settlement of nomadic tribes. Movements of the Bedouins into settlements have already taken place at a high rate. The location of the project will further enhance population movement towards settled life in villages and towns. During construction of NSADP some locals will be attracted to the sites. In the longer term it is to be expected that the local Bedouin tribes will become more familiar with populated settlements.

No recognition of land rights of local tribal population (primary negative impact): The Bedouins claim land rights over the whole project area either under tribe,

clan or family control. The location of NSADP and the planned reclamation of vast tracts of land will threaten tribal territory and hence their rights over the land. The design gives no recognition nor guidance to how this very serious issues can be resolved.

To allocate a relatively small portion of land on the fringes of the project area, as included in the design, is a serious shortcoming of the planners. Indeed, there is no recognition of the rights of the already settled local tribal population involved in agriculture or other sedentary activities.

It is assumed that the project will rely on existing national civil laws on land ownership and ignore the local government land ownership laws, which are more favourable to the Bedouin tribes. Also the planned phased development of the largely uninhabited Blocks 1 and 2 before Block 3 may cause concern among the local population. In terms of location, design and operation of NSADP, the impact in relation to land rights and ownership will be highly negative on the local Bedouin population.

No equity in land holding for Bedouin settlers (primary negative impact): The present land holdings of the Bedouin could be at risk, depending on how successful they are at registering and claiming ownership over existing holdings. The design allocates 3.3 feddan in the deep, sandy soils in 10 per cent of the NSADP area (table 1). Given that the terms of selection for the 'social' categories regards the Bedouin the same way as small-holders, it appears somewhat inconsistent that the Bedouin are to be allotted smaller land holdings. The allotment of 3.3 feddan versus 5.0 to other small-holders is viewed as highly unsatisfactory by the holders.

Inadequate infrastructure and housing for local population (primary negative impact): To the locals, their experience and knowledge of what infrastructure is appropriate for the best use of the environment and also for their economic, cultural and personal needs is important. For instance when settling villages the Bedouin prefer to spread out along the main road to reduce the distance to the public services and to exploit the economic opportunities brought by the road traffic. Therefore the impact of the design may be highly negative on the local inhabitants.

House surface area will be 28.5 m^2 for small-holders/labourers. For the local Bedouin the planned spatial design of the houses will be inadequate and will have a highly negative impact. They are accustomed to a desert lifestyle which is spread out and dispersed in terms of living arrangements. There are suggestions to allow the tribal Bedouin to build their own houses. The design of the houses and the supply of credit must reflect their requirements. Without this important modification it can be expected that the operation of the project in terms of housing will impact negatively on the locals.

For the locals who have customs and traditions protecting privacy (a legacy of open desert lifestyle) the intimacy of the planned houses will have a highly negative impact.

Social unrest due to inadequate integration strategy (primary negative impact): 'Values' are the areas of beliefs, norms and acceptable behaviour in a community. The

Bedouin have a distinct traditional value system. The danger is that the newcomers and locals will not respect each others values and this may create tension within the community.

For the local tribes, customary laws play a very important role in water rights and land ownership as well as the moral codes and principles binding tribal society. The design of the project makes no mention of local tribal customary laws. As a consequence one can expect major difficulties for the locals when they are confronted with the NSADP proposals.

Once again, attitudes towards the Bedouin will play a major role in the successful integration of project communities. The NSADP plan does not include a positive integration strategy. Indeed the attitudes to Bedouin as reflected in the size and location of the Bedouin land holdings do not give sufficient respect to the important role of Bedouin culture in North Sinai, which in itself may hinder successful integration.

Experience at the village level in North Sinai has shown that non-Bedouin Egyptians integrate with Bedouin culture more easily than *vice versa*. It is also important to note in this respect that the Bedouin society is endogamous (that is marriages are made mainly amongst Bedouin, usually in the same tribe). While it is difficult to assess integration in villages in which non-Bedouin culture is dominant, the Bedouin have proven to adapt to new environments. Therefore a low positive impact can be expected in the long term.

Loss of cultural heritage (primary negative impact): The impact on the preservation of tribal culture will be highly negative. The project will accelerate the move away from the traditional Bedouin nomadic lifestyle, and will particularly impact on Block 5 which is still largely semi-nomadic. Contact with the new population and a different mode of production will erode some of their social values and erode some of the principles of customary law.

While the Bedouin have been moving to settlements in recent years, this has been undertaken within their own communities; as a result much of their traditional culture has been retained. Bedouin are the predominant inhabitants of the project area, which has also enabled the preservation of their culture until now. An influx of settlers will in the long term sway this population and cultural balance.

In NSADP no locally based socio-economic survey of land use activities has been undertaken. This has led to the assumption and misconception about the local Bedouin inhabitants. Simple errors, including the fact that most of the Bedouin are in Block 3 and should therefore not be concentrated in Block 2 as the design stipulates, the labour supply shortage anticipated and the impending clash over land rights and holdings, could have been avoided.

DISCUSSIONS

The impetus for land reclamation and resettlement is strong, particularly in a developing economy like Egypt where lack of productive land coupled with population pressures creates the need to open new lands. In theory, land reclamation is potentially rewarding.

However, planning, implementation and management of land reclamation schemes are fraught with difficulties. A number of specialists in this field (Scudder & Fahim, 1981; Tadros, 1975, 78; Mehanna *et al.*, 1984; and Hopkins, 1988) have been critical of aspects of Egypt's land reclamation schemes. In particular the overall success in terms of socio-economic conditions has been questioned (World Bank/Arab Republic of Egypt, 1992b).

The Egyptian government was not deterred by, and actually challenged, the economic criteria and calculation methods by which donors judged the results of the land reclamation projects. They argued that land reclamation had external benefits, such as generating employment (the share of labour costs exceeded one-half of the total), relief of crowded areas, and defence (a presence in the Sinai Peninsula) that simple economic cost-effective analysis did not reflect (USA Federal Reserve Division, 1991). The new angle of 'national security' (Shash, 1993) proposed by the government from the geographical point of view, is highly questionable in view of the peace accord with Israel and the fact that the project itself will create more social and political unrest, as will be discussed later.

The economic viability and sustainability of the NSADP project has been questioned (World Bank/Arab Republic of Egypt, 1992a, El-Khodary, 1993a).

The NSADP-EIA states that the Bedouin claim land rights over the whole project area either under tribe, clan or family control. The location of NSADP and the planned reclamation of large tracts of the land will threaten tribal territory and hence their rights over the land. The design gives no recognition nor guidance to how this very serious issue can be resolved. To allocate a relatively small portion of land on the fringes of the project area as included in the design shows a serious shortcoming of the planners. Indeed there is no recognition of the rights of the already established settled local tribal population involved in agriculture or other sedentary activities. The assumption is that the project will rely on existing National civil laws on landownership and ignore the local government laws which are more favourable to the Bedouin tribes (World Bank/Arab Republic of Egypt, 1992b).

Law no.148 recognises original land ownership and provides for compensation, under certain conditions, of land whose expropriation may be necessary. These conditions, however, may not be fully satisfactory to the Bedouin as only legally used or cultivated desert land is considered private property, such conditions of proprietorship being legal title of land; desert land reclaimed or cultivated for at least one full year before issue of Law no. 124. No land, or part of land, under rain-fed irrigation will be considered as reclaimed (World Bank/Arab Republic of Egypt, 1992a).

Thus it can be concluded that it is unlikely that the customary land rights of the local Bedouin will be respected, and equally unlikely that they will receive any compensation under Law 148. The law, in turn, has been designed only to protect government planned reclamation and irrigated-crop farmers. No rights to grazing land, livestock production enterprises, rain-fed cropping enterprises and self-motivated local land reclamation (outside government

schemes) appear to be respected by this law (World Bank/Arab Republic of Egypt, 1992b).

The EIA stresses the fact that 'the Bedouin are viewed [by the planners] as having questionable farming skills. On the basis of that assumption and their lack of experience with cattle, Bedouin will not be involved in the main livestock activities of the project. Instead, they have been designated as the labour pool for the other settlers who have been allocated larger farm plots. This implies that they are only marginally integrated into the agricultural production process of the project plan. Moreover, their farming plots (3.3 feddan) are the smallest' (World Bank/Arab Republic of Egypt, 1992a).

Also the planned phased development of largely uninhabited Blocks 1 and 2 before Block 3 (anticipated to be completed in year 2000) may cause concern among the local population. The operation of the project can therefore expect to confront problems in relation to the Bedouin claims to the land as has been experienced in other Egyptian reclamation schemes in West Nubariya and South Tahrir. In those schemes, the Bedouin responded by non-cooperation and in some cases acts of sabotage. It can be expected that the same will occur in North Sinai (World Bank/Arab Republic of Egypt, 1992b).

It is not surprising that what the NSADP-EIA anticipated January 1992, came true in 1993, before even the El Salam Canal reached Sinai. In an article published in its weekly edition Akhbar El-Yom, one of the two most popular national newspapers, 180 government employees in Sinai, established the first investment project under the supervision of the governorate to reclaim 27,000 feddan in Balouza region, North Sinai. Ninety per cent of the land was distributed to the local population and only ten per cent to people originally from the Nile Valley that came to serve as government employees in Sinai. The investors paid down-payments to the governorate, which gave them three years limit to establish the project or the land will be confiscated. The investors were surprised after acquiring the land, putting signs, digging a well and cultivating 40 feddan – a process which cost 50,000 Egyptian pounds-that the Bedouin of Beir El Abd had removed their plants and destroyed the only well (Shawkat and El-Zanaty, 1993).

When questioned Gen. Munier Shash, Governor of North Sinai, stated that 'We acknowledge customary land rights', he added 'I have pursued this policy since I have been appointed as governor 10 years ago knowing the nature of the natives and to avoid problems... What else can I do?... I cannot bring any investor from outside Sinai and present to him its land to develop… He will not be able to do it as the Bedouins will prevent him.. The government has not offered any thing to land reclamation projects in Sinai and the local people must get remunerated for the lands developed by individuals and investors' (Shawkat and El-Zanaty, 1993).

These problems have also been anticipated by Egyptian anthropologist, Professor Ahmed Abu-Zied, who predicts that when the government begins implementing the NSADP and distributes the land to new settlers, problems will arise. Sinai land, in the native's

opinion is a property of the Bedouin tribes that had inhabited Sinai. Nobody else has the right to use, cultivate or own it. On the other side, it is not easy to force these tribes to abandon their 'possessions' or to expropriate it by force. There is little weight to the opinion that the land is state property unless its Bedouin users can prove otherwise by official deeds. These discrepancies between the natives and the state will lead to lengthy disputes that may extend and include the new settlers to whom the land was intended for distribution. Consequently unprecedented clashes, unknown to Sinai before, will erupt. Furthermore, new unheard of types of crimes will occur (Abu-Zied, 1993a).

From another point, reactions like these from the indigenous population are not surprising as it seems that they are the last to benefit from such reclamation projects. Springborg (1990) concluded that the state uses the resources of reclaimed land as a primary source of patronage. Surveys of property owners in reclaimed areas show that they have been sold, on highly concessional terms, revealed them to be exclusively government employees. The omission of the NSADP planners to conduct locally based socio-economic survey of land use activities has led to the assumption and misconception about the local Bedouin inhabitants. Such a survey could have avoided labour supply shortage anticipated and the impending clash over land rights and holdings.

Abu-Zied (1993b), states that even if all the ecological difficulties facing El Salam Canal, some social difficulties and problems may arise due to landownership or its uses and the feasibility of awarding land titles to other than its 'owners' of the tribes inhabiting the lands selected for development projects. Also, there is the problem of the degree of acceptance of the indigenous population to the settlers and similar social problems that should be taken into consideration when planning such projects. He also refers to the fact that the Sinai people consider that they have been neglected for a long time by the Egyptian government before the 1967 war. They still differentiate between Sinai and Egypt and refer to the Nile Delta population as 'the Egyptians'. He urges that this problem of lack of sense of belonging should be tackled seriousness and carefulness it deserves.

It is not only the material loses that the Bedouin have to suffer, it is also the loss of their culture and heritage. This reminds us of the words of Leo Tregenza, in the forward of Hobbs (1989) excellent book 'Bedouin Life in the Egyptian Wilderness', we quote 'Who knows what disasters the spread of applied science may have in store for us? All the more reason therefore to hope that some regions of our planet are not involved in that process. It would be a great pity if the way of life so well described in the following pages eventually comes to an end. I hope this book, especially the chapter on the conservation policy of the Khushmaan for their natural resources, will be a real help in its preservation.' Abu-Zied (1993c) warns that Sinai is a peculiar community being basically tribal in its hierarchy and still retains many of the characteristics of the tribal way of life, irrespective of all changes and developments. Comprehensive development should take into consideration the human side, represented

by the culture, values, heritage, customary laws and human relations so that development policies, or some of its projects, would not contradict with the prevailing traditions.

Hobbs (1986) states that, 'collective ownership of space and biota does not encourage individuals to use places and resources responsibly. Nomads define biotic resources by spatial and social values, not only biological and economical ones.' Hobbs continues, contrary to previous beliefs, pastoral nomads are exceptionally protective of their environment and work to maintain a balance between themselves, their herds, and wild resources. He concludes that 'instead of insisting that nomads settle, or assuming that their livelihood is faulty and in need of outside management, we may look at the Khushmaan for instruction on how to use desert resources more wisely. For some ten thousand years, only pastoral nomads have made a successful sustainable living in some of earth's most difficult places. In a world of expanding deserts, there is much to learn from them.'

El-Khodary (1993b) had proposed that Block 5 development should be excluded from the NSADP plan for various ecological, environmental, economical, technical, and, more importantly, the preservation of the Bedouin culture and heritage. The World Bank support for land reclamation is 'conditioned on assurances that the welfare of the indigenous population will be protected' (World Bank, 1978). Indeed in the specific case of the North Sinai this is also a factor which warrants consideration of an alternative approach (World Bank/Arab Republic of Egypt, 1992b). Although it seems that the World Bank has abstained from financing the NSADP, it is an accessory to a crime that is being committed now, with Gulf funds, by maintaining a conspiracy of silence towards the negative environmental, economical and social impacts of the project. The loss of habitat to migrating birds, for example, should make the project squealer of only national but international significance.

Up until the late '80s, the World Bank and other major lending agencies cared very little about the environmental consequences of projects they so lavishly funded. And in case after case, 'development' took place at the expense of forests, waters, air and grasslands of poor countries – not to mention their indigenous peoples (Abley, 1994). We hope that what B. Conable, World Bank President, declared in May 1987, 'Good ecology is good economics... If indeed the World Bank has been part of the problem in the past, it can and will be a strong force in finding solutions in the future' (Lawyers Committee for Human Rights, 1993), will come true. Also, we urge the World Bank to take preventive measures, by denying funds to governments not taking environmental considerations, including the social impacts, in planning of its large-scale projects, even if those were not funded by the bank.

Irrespective of the fact that the Egyptian government bypassed the international requirements for financing projects by seeking Gulf funds, we hope that the international community will advocate the recommendation of the study that 'In order to reduce the negative impacts on the local population in Sinai…prospective funding agencies should make financing of the NSADP subject to conditionality with respect to...development by

the Egyptian authorities of a positive integration strategy for the indigenous population of the Sinai, based on equity and preservation of cultural values and heritage' (World Bank/ Arab Republic of Egypt, 1992a). It is a must that a comprehensive forecast of the consequences of the planned settlements carried out immediately. A compromise reached should be acceptable to the Bedouin. The compromise should depend on an in-depth understanding and evaluation of all the social, economical and political conditions prevailing in Sinai (Abu-Zied, 1993a).

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