Water and Poverty: The Themes

A Collection of Thematic Papers

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Contents

Abbreviations

ADB	Asian Development Bank
AWARD	Association for Water and Rural Development
BHNR	basic human needs reserve
Cap-Net	Capacity Building Network For Integrated Water Resource Management
CBO	community-based organization
CDF	Community Development Forum
CMA	catchment management agency
CPRC	The Chronic Poverty Research Centre
CWIS	Commonwealth of Independent States
DDC	district development committee
DFID	Department for International Development - United Kingdom
DRA	demand-responsive approach
DWAF	Department of Water Affairs and Forestry
FAO	Food and Agriculture Organization
FO	farmers organizations
GNP	gross national product
GWA	Gender and Water Alliance
GWP	Global Water Partnership
ha	hectare(s)
IDE	International Development Enterprise
IFAD	International Fund for Agricultural Development
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
IMT	irrigation management transfer
IPCC	Intergovernmental Panel on Climate Change
km	kilometer(s)
m	meter(s)
MDBs	multilateral development banks
MDGs	Millennium Development Goals
mm	millimeter(s)
PIM	participatory irrigation management
PRC	People's Republic of China

PRSP	poverty reduction strategy paper
t/ha	tonnes per hectare
UIB	Upper Indus Basin
UK	United Kingdom
UNDP	United Nations Development Programme
USWASNET	Uganda Water and Sanitation Network
VDC	village development committee
VWC	village water committee
WHIRL	Water, Households and Rural Livelihoods
WLB	Walawe Left Bank Systems
WPI	Water and Poverty Initiative
WSDP	water services development plan
WS&S	water supply and sanitation
WSSD	World Summit on Sustainable Development
WUA	water users association

Overview

Meeting the needs of the poor has too often been seen as simply providing drinking water. Important as this is, it is far from the only challenge facing poor women, men, and children around the world. They also need access to water for productive use to provide a livelihood, and water is critical to the ecological services on which many of the poor depend.

The ideas set out in these theme papers reflect the general consensus in the international water community that the importance of water resources as a weapon in the war against global poverty must be demonstrated and highlighted more effectively. A growing body of evidence, including experiences from case studies, suggests that water is indeed a significant key to sustainable development. These theme papers examine some of the ways in which this is true.

The problems with water and its use pervade the lives of the poor. The link between poverty and the familiar issues of health, food security, and environmental integrity are well understood and widely documented and there is common agreement that poverty and water are inextricably linked in many parts of the world. The details of this connection vary greatly, but the impact of water on the lives and prospects of the poor is clear. Pro-poor actions in water service provision and resource management for improved health and well being should be a central element of any program to tackle poverty in most parts of the world.

While it is true that globally, things have improved at a faster rate than at any time in human history and developments such as broader and improved irrigation, increased water supply coverage, better primary health care and education systems have improved the lives of many, it is also true that the poorest and most vulnerable remain untouched by this progress and will remain so however well we make conventional approaches work. As things stand, if we continue to rely solely upon traditional approaches, the best we can hope for is improvements that will help more poor people significantly, but still leave a significant proportion of the poor with few or no prospects of ever improving their water security.

Above all, there can be little optimism that the approaches of the past century can be replicated to reach the hundreds of millions of the poor who live in societies and environments where large-scale infrastructure investments will not work. For these people, new approaches are needed to water management that more closely reflect their conditions of poverty and optimize the opportunities that exist to reduce this poverty. Identifying such innovative approaches is one of the main goals of this paper. As we shall see, many of these innovations do not relate only to techniques for the management of water resources and services. They reflect the wider political, institutional, and governance conditions in which this management takes place, at all levels from the individual and local community, to the national and global levels.

The themes outlined in this book explore ways to improve the institutional framework and governance conditions that regulate access to these resources. They touch tough issues such as the need to create more pro-poor water governance, improve access to quality water services, mainstream gender in all aspects of water management, involve and empower the poor and develop their capacity in making decisions that affect their water management and their water-related livelihoods, strengthen their ability to cope with disasters, manage the water resources sustainably, and improve the health and well being of the poor.

There are no easy prescriptions, no panaceas, or universally applicable solutions. But there are some fundamentals that apply everywhere, including the need to create fair and representative governance conditions and means of participation for all ensuring efficient and sustainable levels of service provision. There is also the need to ensure that water is mainstreamed into wider national and international development approaches such as the poverty reduction strategy papers. Water can-and often does-make a major contribution to poverty reduction but water management alone will not solve poverty problems and poverty will not be reduced without improved water security.

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Pro-Poor Water Governance

Maggie Black and Alan Hall
Global Water Partnership

Introduction

The Global Water Partnership (GWP) has prepared a background paper addressing this theme entitled Poverty Reduction and Integrated Water Resources Management (IWRM). The basic premise of the paper is that, in order to construct water management policies and institutions so that the interests of poor people are not only protected but also treated as a priority, it will be necessary to adopt IWRM as the underlying principle of water governance[1].

According to GWP, water governance refers to the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society. At present, the notion of "pro-poor" water governance is aspirational and equity is elusive across the spectrum of development practice. Conventional poverty analysis underestimates the role of water in livelihood provision, particularly in relation to patterns of land and water use and entrepreneurship based on natural products. Until this is rectified, and evidential experience of targeted antipoverty water-related interventions increased, suggestions as to how to make water governance effectively "pro-poor" must be seen as tentative. Nevertheless, IWRM can be seen as a necessary condition for rectifying inequities regarding water resources management, the spread of water-related services, and the burdens of cost which at present typically discriminate against the weaker, least well-off, and most vulnerable groups within society.

Until now, management of water in its different contexts has been assigned to a variety of institutions (public and private) operating independently from one another. In the face of increasing constraints on freshwater, this approach is no longer appropriate. There is growing competition between different uses and population groups over access to surface waters and aquifers, and over the volumes required for different purposes. In any competition over access to resources, whether the natural resources base or man-made infrastructures and opportunities, experience shows that those in poverty emerge worse off, unless they or agents acting for them manage to secure their position vis-à-vis others with more economic and political clout. IWRM can help create a transparent and accountable water regime in which competing claims can be moderated by well-informed participatory processes.

[1] IWRM is defined as a process which promotes the coordinated development and management of water, land, and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (GWP 2000).

Poverty Analysis and Water

Although trends in developing countries' GNP over the past 50 years indicate progress in reducing poverty, in fact averages disguise the existence of large subgroups whose situation has remained the same or is deteriorating. Income disparities between rich and poor both between countries and within them have widened in the same period. There are today estimated to be 1.2 billion people living on less than $1 a day, and 2.8 billion living on less than $2 a day. Many of these people are not living in economies powered primarily by cash transactions via a recognized market. In understanding the relationship between water resources management and poverty, it is these broader statistics that are pertinent, not the more often cited coverage figures for drinking water supplies and sanitation services which illustrate merely a subset—albeit an important one—of the total picture.

Poverty is usually defined in socioeconomic terms, and perceived as a condition in which people's livelihood capacity is inadequate to meet their basic needs. The very large literature on poverty provides no coherent analysis of the relationship between poverty and water access and use. A 1992 study by the International Fund for Agricultural Development (IFAD) showed that out of 4 billion people in 114 developing countries, more than 2.5 billion lived in rural areas, of whom half live on highly degraded soil and 1 billion below the poverty line. Such people are vulnerable to rainfall variation and seasonal food and fodder shortages that have serious implications for their livelihoods. Water stress is implicit in life expectancy rates, child mortality rates, malnutrition levels, epidemic disease tolls, poverty rates among women, employment migration, urbanization rates, flood displacement, even school retention. These interactions are usually overlooked.

When analysis is broadened beyond coverage statistics for drinking water and sanitation—which are a very imperfect surrogate for understanding the water-poverty relationship—the "water-poor" emerge as follows:

- those whose livelihood base is persistently threatened by severe drought or flood;
- those whose livelihood depends on cultivation of food and natural products, and whose water source is not dependable;
- those whose livelihood base is subject to erosion, degradation, or confiscation (e.g., for construction of major infrastructure) without due compensation;
- those living far (e.g., >1 km) from a year-round supply of safe drinking water;
- those obliged to spend a high (e.g., >5%) percentage of household income on water; slum dwellers obliged to pay for water at well above market rates;
- those whose water supply is contaminated bacteriologically or chemically, and who cannot afford to use, or have no access to, an alternative source;
- women and girls who spend hours a day collecting water, and whose security, education, productivity, and nutritional status is thereby put at risk;
- those living in areas with high levels of water-associated disease (bilharzia, malaria, trachoma, cholera, typhoid, etc.) without any means of protection.

The most vulnerable include children, the elderly, minorities (especially indigenous groups), those affected by HIV/AIDS or other kinds of catastrophic

illnesses, those living in shanty towns, and surviving in the informal or invisible economy.

Throughout most of the development era, poverty has been measured according to economic criteria. In the recent past, poverty definitions have broadened to include social indicators (infant mortality rate, literacy, women's status, access to drinking water, etc.) under the influence of protagonists for "human development." Although this is to be welcomed, in relation to water resources and their uses, the debate is not yet broad enough. Arguably, to give water its due emphasis in poverty analysis, nothing less than a paradigm shift in poverty perspectives is called for. The term "water security" has been used to describe the balance between the multipurpose uses of water and the sustainability of resources at household, community, and levels above. Indicators for monitoring aspects of water security, including the quantitative and qualitative condition of the resources over time, need to be established in different settings as an integral component of poverty assessment and reduction. If a shift in poverty and water perspectives occurs—which will have to happen if poverty is to be meaningfully addressed—the case for an integrated approach to water resources management becomes self-evident.

It is surprising, given recent international concern over water issues, that few governments have highlighted water conservation or services as critical elements of poverty reduction strategy papers. This indicates a lack of awareness among economic planners of the significance of water in the resources base, the need for its protection, and for sustainable service delivery. This needs to be rectified, and IWRM as a policy tool allocated greater significance in the pro-poor agenda—which the Water and Poverty Initiative will hopefully promote.

Beyond Sector-Based Approaches

The management of water resources and services was, and for the most part continues to be, disaggregated into sectors, which administer the resources in its different uses: agriculture, health, industry, urban planning, environment, etc. This fragmentation means that there has been no means of moderating between competing, or high-value and low-value, demands. As pressure on the resources grows, and the costs of water infrastructure spiral, the need for an integrated approach to water management has been recognized, and IWRM principles are increasingly being adopted. Gradually, national reforms in law, policy, and administration are being introduced, reflecting concerns for sustainability, equity, and efficiency.

However, few countries are without politically and economically entrenched vested interests in water. Reforms, especially reforms that emphasize equity, are difficult to carry out in a climate of opinion which has yet to understand that water conservation is essential for future survival and development, and is opposed to the idea of putting a price on water provision. Progress toward effective reform is likely to be slow, and without significant changes in popular perception, especially among middle-upper income and politically significant groups, it may prove near impossible in some countries for a long time to come.

Sector-led policies and programs, and poverty reduction

Within the range of sectoral responsibilities around water, the main context for poverty-targeted programs has so far been drinking water supplies and sanitation, promoted to improve public health. In the 1980s, low-cost approaches were developed, usually involving handpumps and community standpipes for water (and some household connections, mainly in towns); and "on-site" facilities (pit latrines) for sanitation. The extent to which poor households have been reached as a subset of new users is unknown: the basis on which data are collected is confined to a rural/urban axis, and coverage extension with no socioeconomic differentiation between users is the standard program goal. But it is fair to deduce, at least from rural coverage figures, that a large number of poor households that did not have one before now have access to a water supply. Sanitation still lags very far behind.

There is evidence to show that access to a household water supply has an impact on poverty. A study in coastal Nicaragua (5,025 households) found that those with a well had 20–100% more income than those without, the difference being most marked among the poorest; and that 40% of the extra income came from garden plots and small livestock managed by women around the house. Similarly, evidence from Ghana suggests that the income of poor farmers in the peri-urban area of Kumasi increased with the informal irrigation of horticultural crops for local markets.

From the household perspective, it is often artificial to classify a source of water as purely for drinking, personal hygiene and domestic use; or alternatively, as purely for irrigation. Poor people's "demand" for water is usually for water generally (not only for health purposes) as essential to their lives and livelihoods; this is an important and neglected angle on the role of domestic service provision in poverty reduction. Most people in communities in marginal environments view water holistically. They naturally operate according to the principle of IWRM, whatever the sectoral context of the services provided.

Large-scale investments in irrigation have been primarily posited on economic growth from raising crop production levels, either of food or cash crops, to improve national availability of food stocks and raise income from agricultural exports. Agricultural policies have provided incentives to grow higher-earning water-intensive cash crops such as rice and sugarcane, even in water-short areas. In many countries, subsidies are given for surface irrigation and/or electricity used for water pumping. Although these are often justified in the name of helping poor people, most benefits usually go to the better off. Perverse subsidies send wrong economic signals to consumers and result in wastage of water and excess pollution.

There is however also evidence, for example from northeastern Brazil and from India, that investment in water infrastructure can create a dynamic rural economy, reducing out-migration and increasing agricultural and other forms of employment. Nevertheless, it is now recognized that the approach of "construction at any cost" of major works is unacceptable. The irrigation subsector needs to improve existing systems, find how to use less water more productively, and become more aware of how policies and projects interact with poverty dynamics. A more integrated approach that targets the poor is needed to make irrigated

agriculture both economically attractive nationally, and more pro-poor at the local level.

Recognition of water's value: from supply to demand

Water has always been recognized as a social good, but is nowadays also recognized as an economic good.[2] Many authorities have noted the wastage and inefficiency resulting from the construction of schemes for which costs are not recovered from consumers and which cannot be maintained. Costly supply-driven policies also inhibit the spread of facilities to the least well-off. Rural schemes suffer frequent breakdowns "at the end of the line." In urban schemes, leakage and illegal takeoff are common. For a variety of socio-political reasons, the better-off almost invariably receive the benefits of water services and subsidies in both rural and urban areas.

However, promoting a change to realistically priced water supplies is difficult politically when water has been previously treated as an infinite resources—a "free" or heavily subsidized good—for urban populations and for agriculture. Farmers have gone in for water-intensive crops in many dryland areas on the basis of uncontrolled groundwater extraction. A further downside of unrealistic value-assignment and pricing is that pollution loads in rivers and lakes are heavy. This results in serious public health and epidemic disease consequences, which again are primarily borne by the poorer members of society. Efficient regimes of pollution charges are therefore also needed, as well as protection of water quality at the community and household levels.

Demand-driven services are supposed to help poor people by allowing their needs to be expressed, and by putting management of their services into their hands. However, it is important that the introduction of the approach is not done in such a way that an earlier-acknowledged governmental responsibility to provide for poorer groups is not simply abandoned. Unless better-off users also pay a more realistic price, the effect is discriminatory. Allocations from the resources base are often skewed in favor of politically dominant groups, bolstered by inefficiency and corruption. Unless there are serious reallocations of service benefits, or significant adjustments in tariff burdens, the least well-off will continue to suffer.

There is today a growing emphasis on community management, and ownership, of water facilities, both for irrigation and community water supplies. However, the jury is still out on whether transfer from government to farmer associations is successful as far as smallholder incomes are concerned. Community management of drinking water supplies has also had mixed results, depending on technical support, skills transfer, and managerial backup; and is not necessarily cheaper. Unless handled carefully, decentralization can have disastrous effects if government merely perceives it as having fiscal advantages. Allocation of water through licensing and regulation also presents problems for equitable distribution. Where administrations are inefficient, callous or corrupt, regimes for pricing, licensing, and adjudicating property rights may be designed to benefit the better-off.

[2] See the 1992 Dublin principles, Agenda 21, and subsequent confirmation in international forums.

Where commitment is genuine, IWRM can establish the right policy framework and rules of the game—with equity as a key policy driver—as well as the necessary institutions. Within demand-driven approaches, IWRM can allow communities and larger administrations to manage resources for many uses in tandem by participative (democratic) processes. And minimal services for the rural and urban poor can be recognized as a high-value use and pricing regimes designed accordingly.

IWRM in Action to Reduce Poverty

There are many forms of "integration": integration of competing uses, integration between sectoral concerns, and integration of demands from different groups. Balancing demands requires political processes and negotiation at all levels.

Watershed protection and regeneration

The onset of water scarcity, because of drought or declining water tables, can provide an impetus to community regeneration of watersheds or depleted aquifers by adaptive use of traditional technologies. Most recent experiments in localized watershed management, micro-planning of land and water use, or integrated service provision have been undertaken by visionary NGOs, in some cases backed by official policy and external funding agencies. Water-short Indian states such as Maharashtra and Rajasthan are home to many examples. Communities have constructed tanks, check-dams, and other structures to capture runoff in riverbeds. They have recharged aquifers, transformed local ecosystems and their surrounding economies, enabling cultivation to continue when adjacent areas with identical rainfall are barren. Transparent and participatory decision-making and the moderation of property rights have been critical.

Community water supplies and sanitation

During the past 2 decades, there have been a large number and variety of initiatives in rural areas and informal urban settlements to develop systems of community ownership and management of basic drinking water and sanitation services. Usually, NGOs have acted as intermediaries between communities and the authorities to help work out structures and systems (technological and financial), organize and fund training of community-level workers, and enable water users associations and local water management committees to become established.

One factor in many successful schemes has been the participation of women as managers, village mechanics, and health motivators. There has also been a strong emphasis on information-sharing and social mobilization. Choice of technology, and the potential for the community to run it and pay for the service, is critical. There is little point in providing electrically pumped supplies, or even handpumps, if breakdowns cannot be repaired. Communities are often well aware of their limitations. For example, when given the option, most communities in Niassa province of Mozambique chose a protected well in preference to a handpump they could not afford. While not ideal, protected wells are a major improvement over the use of streams and swamps, the sources previously used.

Another example is a large-scale gravity-feed water supply system in water-short Hitosa district in Arssi, Ethiopia. The technology is simple and cheap: capped springs in the surrounding mountains, with pipelines serving a complex of public tap stands and household connections in 28 villages and 3 towns. The parties opted for community management, supported and facilitated by government and the NGO, WaterAid. An elaborate structure of representative bodies with many women participants was established over the 3 years during which the pipelines were built. In spite of the deep public sense of vulnerability to water shortage in the area, the transformation from a situation in which water was scarce but free, to a situation in which it is plentiful but paid for, has been harmonious.

IWRM at the macro level

At present, most initiatives depend on local commitment and enthusiasm and are only operational on a small scale. A rare example of large-scale integrated water resources management based on watersheds in Jiangxi Province, People's Republic of China has proved that a balance can be struck between environmental protection, economic development, and social stability. Political support was essential for such a wide-ranging program in so large a demographic, geographical, and administrative unit.

At the interstate and international levels, there are a growing number of agreements on water-sharing between states within federal countries, and between countries sharing transboundary waters. River basin cooperation has been propelled into existence by the competition between users and uses along such major waterways as the Ganges, Nile, Jordan, and Mekong rivers. Here, the impetus—especially in such water-short areas as the Middle East and Northern Africa—is the resolution of tensions over the use of shared waters. Equity considerations are usually interpreted as the balancing of upstream and downstream interests. Although interstate and international agreements on shared water have little directly to do with poverty, their decisions may have a direct impact on those who depend on the sharing of water costs and benefits, among whom there are many risk-prone groups.

In spite of progress, there is a long way to go to translate IWRM into policy and practice frameworks. Most governments are understandably reluctant to confer responsibilities over watershed management to communities in a systematic way. The problems of integration with geopolitical and administrative structures are very real and decentralization can be perceived as a risk to service consistency and technical standards. Aside from this, there is resistance from the various bureaucracies and their local construction allies, for whom any loss of control over implementation of service delivery has negative financial implications.

It is therefore important to address the implications of promoting IWRM as a means of resolving equity issues at levels above the local, and put in place appropriate laws and policies. Decentralization and community-based solutions are important but should not become a new, over-simplistic mantra. Governments must undertake the overall allocation and regulation of water resources and not abdicate their responsibilities. The signs are that the tide in favor of IWRM is turning and balances between central regulation and decentralized management can be achieved.

Absorbing equity considerations into IWRM policies and mechanisms

In order for IWRM to be progressively introduced, there will need to be changes in law, policy, and regulatory frameworks. In undertaking such changes, equity requires that the interests of people living in poverty need to be considered and affirmed. Affirmative or protective legislative elements include:

- granting of special water rights to people designated as "below poverty line" de-linked from landownership;
- protection of traditional and customary water rights enjoyed by indigenous and minority populations and/or due compensation in the context of major irrigation or hydropower projects where access to their livelihood base is affected;
- reservation of some quantity of water to be guaranteed for basic needs, and for environmental protection, to sustain population groups with little or no purchasing power and avoid degradation of the environmental/livelihood resources base.

Examples exist where changes in legislation have improved opportunities for poor people. Among other examples is Mexico's new water law, passed in 1992. Users were given much greater say, and tradable water rights were introduced. In some areas the effects have been dramatic, with substantial reductions in the pumping of aquifers. However, wherever market incentives are introduced, careful attention is needed to considerations of equity. Water markets can help improve water allocation and use, thereby promoting efficiency; but unless their introduction is accompanied by appropriate provisions for vulnerable groups, and for environmental protection, the trading of water can promote social exclusion and environmental neglect. The same observations apply in relation to the policy thrust for private sector involvement in water services or politically manipulated public utilities. While service coverage may be increased, poorer areas are often excluded and wealthier citizens undercharged.

A number of laws and regulations relating to water and land use remain on statute books around the world which are often applied in a discriminatory way against disadvantaged populations, effectively depriving them of customary rights over the natural resources base and denying them title. A conscious effort needs to be made to reconcile such customary rights equitably within a modern legal framework: the rapid pace of change, the spread of the global economy and its absorptive power of resources and entrepreneurship, may otherwise further marginalize groups unable to defend their rights at law. All changes in regulatory regimes need to be accompanied by the allocation of sufficient financial, institutional, and human resources to allow for their effective implementation.

Management and institutional systems

The introduction of IWRM in such a way as to ensure equity has important implications for management and institutional systems. Some actions will be specifically targeted toward disadvantaged populations, such as those directed at vulnerable, at-risk, and low-income groups, or those classified as "water poor".

Others will involve the introduction of a more rigorous equity focus within existing service delivery systems and water resources management regimes. Given the recent emphasis on water as an economic good, and the use of market mechanisms to control demand and ensure financial sustainability—policies which can reinforce inequities rather than reduce them—the second category of actions is likely to be more challenging to implement than the first.

These actions include, but are not confined to, the following:

- the collection of data relating to "water poverty";
- a specific focus on populations vulnerable to drought and flood;
- Capacity building of professionals in low-cost water and sanitation technologies;
- capacity building at all levels for democratic and demand-responsive approaches;
- a special emphasis on the involvement of women in decision-making;
- development of partnerships between sectors and implementing bodies—public, private, NGO—to secure synthesis of pro-poor policies;
- advocacy of balanced subsidies and pricing mechanisms to redress inequity;
- the use of tools which capture discrimination, such as gender assessment, social impact assessment, and participatory rural appraisal;
- a stronger policy emphasis on information, education and communication.

Conclusions and Recommendations

Since the principle of IWRM became accepted as the way to manage water in a highly-populated, over-polluted, and water scarce world, there has been a tendency to regard its implementation as all that is needed to usher in a new era of sustainable, efficient, and equitable water resources management. There is an inadequate appreciation of the gap between rhetoric and implementation, and the profound overhaul of laws, policies, and practices entailed. There are real complexities in putting it into effect, at all levels and in all contexts: managerial, administrative, technological, behavioral, and above all political. Some of the competitions over freshwater resources that IWRM can moderate are deeply felt—livelihoods depend on them, and effective modalities for negotiation will not spring into existence because policymakers agree that they should. Protecting the interests of the 1.2 billion people who live in direst poverty as a subset of these negotiations adds a further set of complications. However, the adoption of IWRM makes this prospect more attainable than would otherwise be the case.

The pace and sequence of reforms for IWRM are critical. Policies, laws, and management instruments are only as good as those who administer them. Many economic planners and finance officials have yet to appreciate water's role in all aspects of productive life, and the profound implications of water shortage and pollution for the livelihoods of the population as a whole, let alone its most vulnerable members. As a starting-point, a better analysis is required of the interconnections between access to water and water-related services, and the priority needs of those whose lives are supposed to improve as a result of poverty-reduction initiatives.

In order for people living in poverty to improve their water access, affirmative action on their behalf will be needed. It is only realistic to recognize that political

resistance in many settings will be considerable, and the implementation of IWRM will have to grapple with the trade-off between the feasible and the theoretically ideal. The need to secure the rights of vulnerable groups to their natural resources base of land and water should not be sacrificed in the cause of service efficiency and cost-recovery.

The following recommendations emerge from the paper.

- Since "water poverty" is an important and unrecognized component of poverty generally, a paradigm shift in poverty thinking should be energetically promoted.
- Purely sectoral approaches should be avoided, not only on the grounds of inefficiency and unsustainability, but because they are unlikely to promote equity.
- Care needs to be taken that certain principles—water is a scarce resource and an economic good—are not introduced so that they discriminate against poor people.
- Efforts should be made to solve the problems of introducing catchment-based management of natural resources on which so many livelihoods depend.
- Reforms of laws, policies, institutional and management structures should place an important emphasis on equity and poverty reduction.
- Specific policies and programs should be undertaken to redress the disadvantages of at-risk and vulnerable groups.

IWRM cannot be a panacea for poverty reduction. However, it can facilitate management of water resources and water services in ways that will help reduce poverty. Any proposed change in laws, policies, and administrative structures has implications for winners and losers, which may not be clear at inception. Since IWRM contains prospects for the equitable allocation of benefits from dependent water and services, it is important that these opportunities for healthier and more productive lives among the most at-risk and disadvantaged population groups are not lost, but are transformed into reality.

2

Community Capacity Building and Empowerment: Wasting Resources or Ensuring Sustainability?

Belinda Calaguas (WaterAid) and
Jennifer Francis (The Gender and Water Alliance)

At the World Summit on Sustainable Development,[1] governments rightfully put pressure on themselves to deliver adequate sanitation and safe drinking water by 2015 to halve the proportion of people without access. They also confirmed the target of developing water resources management plans by 2005—a commitment first agreed at the Rio de Janeiro Earth Summit a decade before.

Questions on how to deliver these commitments and how to finance them are the subject of much global and national debate. Many of these debates are focusing on how the international private sector—either as service developer/provider or development financier—might be harnessed by governments and funding agencies to help fulfill state commitments.

Less attention is paid within discussions on who needs to benefit from the new commitments, the nature or levels of service that are appropriate to them, and how these might be brought about and sustained. Of the estimated 1.1 billion people without access to safe drinking water today, more than 80% live in rural areas, and the majority live in low-income and highly-indebted countries in Asia and Sub-Saharan Africa. International private sector financiers and operators are less attracted to invest in these areas.

Little attention is also paid to other aspects of water security for the poor, particularly those relating to poor people's uses of water for livelihood and production activities, their vulnerability to water-related environmental disasters, and the need to ensure the integrity of ecosystems.

The Water and Poverty Initiative, sponsored by the Asian Development Bank on behalf of the World Water Council to prepare for the 3rd World Water Forum, focused its work on understanding how poor people's water security could be addressed sustainably. In dialogue with several different water stakeholders, six key action areas were identified.

[1] Johannesburg, 2002.

- Pro-poor water governance
- Improved access to quality water services
- Pro-poor economic growth and livelihood improvement
- Community capacity building and empowerment
- Disaster prevention and mitigation
- Management of the environment

This paper discusses the fourth area of action and its existing policy and operational imperatives. It also outlines how to achieve community capacity building and empowerment to achieve water security for the poor.

Rights and Responsibilities

In November 2002, the UN Committee on Economic, Social and Cultural Rights agreed on a General Comment on the right to water. This new legal standard guaranteed the human right of every individual to sufficient, safe, affordable water for domestic and other needs and made clear the duties of the state and non-state actors in respecting, protecting, and fulfilling this right.

How can poor people's water needs be assured, their rights to water fulfilled and protected? There is much discourse that emphasizes the importance of good water governance in order to achieve water security for all, not just the poor. Indeed, at the 2nd World Water Forum,[2] Ministers declared that the world's water insecurity is not due to scarcity, but in fact results from a crisis of governance.

Good governance hinges not solely on effective and transparent government, but also on active citizenship. The right of individuals to sufficient water and adequate sanitation are bound up with their responsibilities in achieving that right. In many developed and developing countries, that direct responsibility is expressed in little more than paying a (subsidized) fee for the water used. In poor societies, however, the direct responsibilities are bigger.

Achieving good governance over water resources and systems in poorer developing countries requires the ability and capacity of the people, especially poor women, men, and children and their advocates

- to participate meaningfully and advocate effectively their interests in processes of decision-making over water,
- to hold decision-makers to account for decisions that trample on or present a barrier to their achievement of water security, and
- to gain redress for their grievances.

In addition, poor communities are expected and mobilized to become actively involved in water-related development projects. This responsibility is not just in terms of assisting engineers and extension workers through labor and materials, but also in terms of managing water infrastructure and systems as well as maintaining and repairing them. They are also expected to contribute to a water project's capital costs, as well as its operation and maintenance costs.

[2] The Hague, 2000.

These responsibilities are not contentious. The new reforms of water policies and their implementation guidelines already emphasize the need for community-based approaches and people participation. They are enshrined in the Dublin Principles, as well as in every subsequent declaration on water since 1992. And they give real people the right to become actors in their own development.

In practice, evidence shows that community management can achieve a great deal. It is certainly a factor in ensuring the operational sustainability of water facilities. Community management arrangements are not limited to simple, stand-alone community water supply schemes, but have been shown to be effective even with large piped systems in poor rural or urban slum areas.

However, people need support to carry out their responsibilities. Poor communities cannot do it alone. Sooner or later, community management of schemes breaks down. The reasons for failures are many. They include policy, operational, resources and institutional barriers, not to mention professional attitudes that need to be overcome.

Policy Imperatives to Community Empowerment and Capacity Building

In 1992, the four Dublin Principles were agreed at an international conference on water and environment and endorsed at the Rio Earth Summit. One of these principles stated the importance of wide participation of users in the integrated management of water resources, and singled out in particular the involvement of women in water development. In the ensuing years, water policies across the developing world were reviewed and reformed to embed the Dublin Principles.

In the community water supply and sanitation sector, the demand-responsive approach (DRA), as it came to be called, formed the backbone of reforms that sought to address problems of unsustainable infrastructure and services.

The DRA seeks to place the community at the center of development. Communities become the key development actors: their demand for services triggers development, which they have to assist in constructing, financing, maintaining, and managing. They must work with health workers and spread hygiene and sanitation messages to their neighbors and adjacent communities. In urban water supply and sewerage, though communities are not considered key actors—public utilities and the private sector are—there is an increasing demand for underserved and unserved communities to get involved, for example, in policing to ensure that connections are not tampered with. Civil society groups working with these communities are often expected to work with public and private providers to enable them to design appropriate services. As more urban utilities are reformed to enable the private sector to manage operations, the demand increases for civil society groups working with the urban poor to be involved.

In the agriculture and natural resources sectors, concepts of users' associations in improving irrigation systems to increase crop production and community stewardship over forest and water resources have long been established in policy and project designs. Farmers are organized into water users associations to maintain irrigation canals and control water flows. Communities are mobilized for various conservation and environmental rehabilitation projects that have a direct effect on the quality and quantity of water resources in given watersheds. The recent World Commission on Dams report states, among its strategic

priorities, the involvement of communities that may be affected by dam-building from the very early stages of designing dams, or in reviewing options other than dams.

Integrated water resources management (IWRM), which promotes "coordinated development and management of water, land, and related resources"[3] also requires broad participation of multiple stakeholders in the processes of IWRM, including civil society and community-based organizations. The Global Water Partnership, which promotes IWRM, sees the value of these organizations in both advocacy of poor people's interests and environmental protection issues, as well as in the mobilization of communities for water development and management activities.

A large number of countries are today implementing decentralization policies implying a transfer of responsibilities and/or activities from national to district departments, local government, communities, and other actors such as NGOs and the private sector.

The new international agreements, particularly, the Millennium Development Goals in water, sanitation, and water resources management will intensify the requirement for communities to be active development actors, as governments and funding agencies step up efforts to reach the agreed targets.

Community Participation, Management, and Empowerment: What Does it Take?

The various community responsibilities in relation to water security require some unpacking if we are to understand what resources and assistance they require. The lexicon includes a range of activities and levels of responsibility, all prefixed with the word "community," including involvement, participation, management, and empowerment. Often they are used interchangeably. But different levels of responsibility in relation to water-related development activities require different levels of capacity from communities, their organizations and advocates. In turn, they will require different levels of assistance and resources from development workers, both governmental and nongovernmental.

Let us investigate this in community water supply and sanitation. At its most elementary, before assistance external to the community is even involved, demand-led approaches require a community to muster its own available capacity to make its demand for water services heard. This capacity will need to include some pooled financial resources to send an emissary to the nearest government office where the demand has to be communicated (especially for rural communities that are at some distance from the town center). Or it needs to include pooled skills and contacts to send or take a request for services to government and follow it up. The capacity to come together and pool resources may be undermined by the relative effectiveness of locally elected officials and other community leaders to gain information about development programs and priorities of government and take this into the larger community, rather than just a narrow group of associates. Community participation in a development project, in any case, will require information, resources, and efforts from government or local development agencies.

[3] In the Introduction to the GWP Toolbox on IWRM: www.gwp.ihe.nl/wwwroot/GwpORG.

Box 1. Community Exchanges

One of the ways that information about development initiatives reaches isolated villages is through the organization of community exchanges. In Tamil Nadu state, India, the local NGO Gramalaya helped women's groups that have successfully completed a water or sanitation scheme to visit their neighboring village to talk to the women there. In addition, Gramalaya also assisted a group of women from the other village to visit the project village and talk to the women who are active in the development projects. In this way, on the one hand, the women in the project village were able to talk about how they achieved their success and gain pride and confidence in their achievements. On the other hand, the women in the non-project village were able to find out what was actually needed by way of commitment, and to realize that they too could be successful, thus boosting their confidence in embarking on the project.

Once a water development project starts, a community's capacity to respond to the demands that a project team makes will need to be raised almost immediately. Providing information to project teams and helping to assess that information so that decisions on project design are appropriate to broad community needs, including those of the more vulnerable and least powerful members, requires willingness and capacity of community members to act outside their traditionally-expected roles and actively advocate their needs. What often undermines this capacity includes entrenched discriminatory attitudes toward different members of the community (particularly women and children) and the power of leaders and other local elites. Thus, not only is information-provision/awareness-raising important in engendering participation, but activities to empower vulnerable members of the community and to resolve inevitable conflicts among its members are also necessary.

So to enable this broad community participation requires commitments of time and resources to raise people's awareness of the development project and its operating procedures, tools for empowering more vulnerable members of the community, and skills in facilitation and conflict resolution on the part of government and development agencies.

After the initial phases of participatory water development, community members are mobilized and organized to get involved in the construction, financing, operation, and management of water projects. New community institutions may be set up, (e.g., water users associations of farmers in irrigation projects, water committees in water supply and sanitation (WS&S) projects, or existing ones adapted so that they could perform the management responsibilities required to sustain the new water systems). Often, assistance to the community associations are limited to a few days of skills-based training (e.g., running meetings, keeping books of account, or operating and maintaining water points), in keeping with the limited management responsibilities that they are expected to perform.

The narrow expectations that development agencies have of these associations—particularly in the community WS&S—are incongruent with the actual extent of management demands on these associations. The change from unreliable water supply to reliable, from unsafe to safe may set into motion changes in the local economy of the community that will have an impact on the water service managed by the community. External factors in the economy, politics or climate will also have an impact on the service, and consequently on the ability of the community management structure to manage.

Box 2. Disputes Within Communities

In a village in Cauca Valle, Colombia, many people came to meetings to discuss the improvement of their water system. There was only one group of people who did not participate from the beginning. It was discovered later that they were the ones who never had problems with their water system in the first place. They lived in the lower part of the village and always had water. After the system was running properly, the group started creating problems saying that now they didn't have as much water as before. This shows the need for full analysis of stakeholders, and to check carefully that all sectors of the community are represented, particularly because group interests may be very different.

In Lumbini, Nepal, disputes are taken up by the Water Users Committee. The committee sends recommendations to the Village Development Committee (VDC) and a decision is made. Most problems are solved this way, but the dispute can be passed on to the District Development Committee (DDC) if necessary. The DDC will then send a team made of members from the DDC, the Water Resources Management Committee, the VDC line agency and user groups to investigate. While there, they will organize meetings with the villagers to resolve the problem. At this point, if the dispute is not settled, the district administration office can become involved. Disputes can last up to 2 years before full resolution (Vischer, et al. 1999:35).

A recent international seminar on the scaling up of community management[4] defined the crucial elements of community management as the "control by the community of both the system and the process that leads to its development; and ownership by the community of the system." Participants at the conference also stressed that control meant the ability to make strategic decisions.

To enable communities to manage their systems—whether it is one stand-alone water point or a network—would thus require capacity building beyond the limited skills training program that many development agencies provide. This level of training may suffice in the short run, but increasingly, the demands upon communities to manage their water systems will require more than the management skills necessary to understand the processes of day-to-day operation and maintenance.

At the least, community management boards of water systems need to understand the legal and policy environment that supports their existence as well as prescribes their operating boundaries and responsibilities. Increasingly, these community management boards will be drawn into the water resources management and planning processes. The capacity to respond to these processes needs to be built within the community management boards. Financial responsibilities will likely go beyond the basic accounting tasks of early systems and expand into deciding upon investments to improve services or expand the system's coverage or rehabilitation of the system. Additionally, if community managed systems are to be seen as viable alternatives to other types of service management systems, then community management boards will need to establish reliable monitoring and evaluation systems that can assist them in making their case.

The assistance and resources required for community management need to be sustainable and scaled up, especially in the community water supply and sanitation sector. At the very least, it is crucial to enable community management boards and water users associations to network and exchange knowledge and experience. Assistance is needed to help them understand the legal, financial,

[4] From system to service – Scaling up community management, 12–13 December 2001, The Hague, Netherlands. Conference report from *www.irc.nl/download.php?file=scalingupcm.pdf*

Box 3. Expanding Management Responsibilities

The Hitosa and Gonde-Iteya gravity-fed schemes in rural Ethiopia are renowned for the fact that a community management structure was responsible for a whole network that serviced 56 different villages of 100,000 people. The water network fed into Iteya town, and over the years, enabled commercial enterprises to establish and thrive. At the start, the competing demands from the commercial and domestic users were not huge and were easily addressed through differential pricing. Meanwhile, additional gravity-fed schemes were constructed in neighboring areas, and the possibility of linking up the different schemes loomed. Over the years, as Iteya town grew, partly as a result of a reliable water supply, the demands on this supply also grew from both commercial enterprises and town-dwellers, as well as those seeking private connections. Consumption by rural dwellers, particularly those who used tap-stands remained minimal, however, thus putting into jeopardy the financial sustainability of the whole system. At the same time, with the ageing of the systems, replacement of corroded pipes and other equipment increasingly required attention. The management of the whole network, the financial decisions that needed to be made, and the need to attend to the state of the water resources meant that over time, the community management structure was such only in name. Since the community management board was limited to only a few days of basic training since 1996 (the year the project started), in reality, local government and the local NGO responsible for the project made their decisions for them.

and environmental issues they will likely face in the future, as well as assistance to learn from their operational experiences and link these lessons to the broader issues they may face. In this way, they become better prepared to make the strategic decisions that will be required in the future.

This level of community leadership is also necessary for the important task of advocacy of poor people's interests in government decision-making over water services and water resources. With governments being pressured to reform their water services, devolve responsibilities, provide for all and target improvement or expansion of services to the poor, there is now a growing need for much more than community involvement in the direct development, operation and maintenance of water facilities.

Governments, especially local governments, are expected to formulate their development plans and investments from the bottom up and in a participatory manner. Community representatives are being sought to sit as members of district development committees, for example. Depending on the Governments' political attitudes, community representatives are in a position to speak as witnesses to

Box 4. Networks of Water Users Associations

The Irrigation Improvement Program in Egypt is a 15-year program of development that includes the introduction of participatory irrigation management throughout Egypt. The program follows a seven-stage approach to building participation of farmers through water users associations (WUAs) at the mesqa (irrigation ditches) level in order to "replace individual farmer pumping (of water) at multiple points along the mesqa by collective single point pumping."

Phase 5 of the approach concerned regular WUA operations, which required regular training in order to establish self-reliant WUAs that are fully owned, controlled and operated by the farmers. Phase 6 was concerned with the building of networks of WUAs into a "Branch Canal WUA" in order to increase the effectiveness of operations and communications between water suppliers, the irrigation authorities, and the farmer WUAs. At all phases of the seven-stage approach, there was to be continuous monitoring and evaluation, particularly process documentation of the phases as well as internal and external evaluation in order to improve the process of building sustainable WUAs. (GWP, IWRM Toolbox Case 110).

the needs of disadvantaged communities. But in order to be in this position and to exploit it usefully, community leaders will require a level of organization that bridges different communities and pools different interests and knowledge together. The extent of efforts necessary to achieve this level of solidarity goes beyond the means of any individual community, particularly poor communities in any given geographic area.

The experience of the poverty reduction strategy (PRS) processes and communities' involvement in these is illuminating. In the PRS processes, community leaders play two critical roles in ensuring that the needs of the poor are addressed in the strategies, and that these strategies translate into real development that benefits the poor. The first role is that of providing information and advocacy—information about needs and priorities and communicating that information to both government and nongovernment advocates so that they may be amplified and advocated. The second role is that of gathering information and advocacy—information about what local government investment decisions are and whether they are enacted within their communities and to what effect, and communicating that information to both government and nongovernment advocates, again for amplification and further advocacy.

In both roles, communities require leaders that are able to articulate their needs and requirements strongly, and have means of communicating this information to those who require them. In both roles, communities and their leaders require assistance from government or nongovernment agencies, particularly to inform them about processes and enable their meaningful involvement in these processes.

Such levels of organization and contacts are equally necessary to ensure that water resources management decisions are pro-poor. These decisions often cover areas wider than existing political or even natural market boundaries, and address both land and water uses. Community participation in these new management arrangements can very easily be tokenistic as traditional ways of involving communities (namely in water project development, as outlined above) will be woefully inadequate. In the first place, communities and their leaders will need assistance in understanding these new demands in water management, the underlying relationships between management decisions to be taken, and their likely effect on communities and people's lives and livelihoods. They will need to be involved in understanding the costs and benefits of these decisions to people, as well as in contributing to a better understanding by government and other development actors of these costs and benefits.

Finally, new actors are being mobilized to dispense what were formally government responsibilities for service provision. The involvement of the private sector brings with it threats of increased opportunities for corruption as well as fears that poor people will face bigger barriers to access services. To counter these, there is growing demand for government transparency and accountability, particularly before it decides to involve private operators. Where government and civil society relations are strong or even benign, this could mean that poor people's advocates will face more opportunities for consultation on, if not contestation of policy. Affected communities and their advocates will require access to information and analysis, much of which may be complex and not readily accessible to lay people. Access to experts, to information from civil society networks that have faced similar

circumstances, and to training schemes to improve understanding of the policies, will all be required.

Civil society groups and communities may also be expected to monitor private sector activities, and to report and seek redress for any grievances or complaints to government agencies that contract them. In a situation prevalent in many developing countries where local governments do not have the resources to supervise and monitor their private contractors sufficiently, this responsibility often falls on communities who are at the receiving end of contracted-out projects. At the same time, communities through their representatives and advocates are also expected to get involved in ensuring that public-private arrangements deliver to the poor, through providing information and advice on how to serve the poor. Again, communities and their advocates will require their levels of organization, analysis, and advocacy capacity to be built up.

In spite of the current rhetoric and the very real need for community involvement in the water sectors, however, communities, their representatives, and advocates are often unsupported to fulfill their roles. There are various reasons why this remains so.

Box 5. Building Networks to Strengthen Community Capacity to Advocate

In Kathmandu, Nepal, the NGO Forum on the Kathmandu Water Supply was established by urban poor CBOs and national and international development NGOs in order to advocate poor people's needs within government considerations of private sector participation in the reform of Kathmandu water services. The NGO Forum sought and was given information by the government, including tender documents. It provided information to the government on the state of services to urban poor areas in Kathmandu and provided alternative recommendations and analysis to the government on how to serve the poor.

In Kenya, the policy framework for CBOs dates back to the 1960s and 1970s. Community water committees can be legally registered as "self-help" groups. However, the challenges faced by most communities today cannot be adequately addressed by this set of policies. A self-help group has critical legal limitations that prevent a water committee from taking legal action if the group defaults on payments, and in the event that the treasurer is stealing money, consumers are prevented from taking legal action against the committee. In trying to resolve conflicts, a water committee asks for mediation at district level or from traditional chiefs, and this system has been working fairly well.

Traditional methods of solving conflicts should not be forgotten, but there should be appropriate legislation when conflicts cannot be settled in this way. (Netwas 2000).

Barriers to Community Involvement

Some of the early examples of DRA policies and guidelines themselves embed barriers to community involvement. Government guidelines in relation to technical standards of water points may proscribe real community decision-making over choice of technology (that are affordable for communities to install, operate, maintain, and repair). Where communities do not have real choices, their motivation and ability to manage water systems in the future is undermined.

Local government and donor project cycles of planning and disbursements could preclude serious efforts to organize and mobilize communities. These processes are perceived to be cumbersome, costly, and to slow down project implementation and fund disbursements. Additionally, the decision-making processes and responsibilities that communities are expected to undertake require a deeper

understanding of the differences within communities, particularly of levels of poverty and the capacity to pay by different households within. Often, however, very little effort is made to gather and understand relevant information in relation to a community's socioeconomic makeup and the internal power relations. Few water projects bother with gathering baseline information, for example. Where the incentives for project workers are tied to targets of physical infrastructure built, or to amounts of money disbursed, the incentive to engage communities in genuine participation and decision-making, which may take longer, is de-emphasized.

Box 6. Unsustainable Technology Choices

In Tanzania, a community had to make a choice between handpumps and a groundwater supply using an elevated tank and a distribution network. Given the costs involved and the management skills available, the best solution for the community was the handpump to improve the existing well. After explaining the requirements of each system, the decision was left to the community. The community decided on the more advanced technology because that showed progress. They made a choice that was not rational. The community leaders, mostly men, who took the decision, were influenced by a politician who had already decided even before the other options were explained. Informed choices can only take place in neutral settings where short-term political influence is minimized. Both men and women as well as future user groups need to be consulted, otherwise communities may decide choices that they cannot sustain.

Contracting community-organizing services is complex.[5] Processes and flexibility in adapting these processes to the community situations are key to achieving community involvement not only at the start of the project, but also more importantly at the end, when the project team leaves and communities are expected to manage their own water facility. Additionally, those agencies that historically are involved in community organizing and mobilizing are unfamiliar with contracting practices and tendering for contracts. Both in designing contracts for community organizing and in tendering for these contracts, community involvement may be jeopardized.

Communities also change over time with members entering and leaving and increasingly, are subject to urban drift in rural areas, which can substantially weaken their capacity. Power structures at this level may be less accountable and representative than at higher levels (including in terms of gender balance), either through deliberate exclusion or because the interests of a community elite are represented in other local community institutions, including those other "development committees" established by the government. Yet, few water development projects address the need to train and develop a wider range of leaders outside of the officers of user committees/associations. And even then, the training that these committee members undergo is basic and associated very narrowly with the responsibility to account for funds or to technically maintain the water points.

[5] See Claton, A. 1999. Contracting and Partnerships. Lessons from Ghana and Nepal. WaterAid investigated the challenges faced by both government contracting agencies and contractors—both for-profit private sector and nonprofit organizations—in contracting community mobilizing and organizing activities.

There are capacity-related barriers as well. For example, in much of Sub-Saharan Africa, civil society groups that work directly with communities are few and face constant problems of organizational survival as they are dependent on foreign funding. Apart from them, local governments are the only agencies with the mandate to organize and engage communities in their own development. Government reforms are pushing more responsibilities on these local government workers, while leaving them resources-starved. Community development units within local governments are not considered high expenditure priority, thus very little can be achieved in terms of involving communities.

There are professional barriers to involving communities and to facilitating them to participate in decision-making. Many professionals in the different water sectors, partly doggedly resisting change, partly insufficiently trained to understand and embrace the changes themselves, undermine efforts and policy directions for involving communities.

And finally, there are political barriers to people's participation in development. The lack of transparency, resistance to engage civil society, a political culture that eschews people's participation or is not used to open discourse, can all serve to prevent community involvement, management and empowerment for ensuring water security for the poor from happening.

Community management expects a level of management capacity, able to deal with different development environments, not least of which is the far greater demand on the resources that exist today as compared to the past. Within an ideal environment where political, social, and economic pressures are not acting as centrifugal forces on communal structures, this may be the case. But even then, growing demands and complexity of demands—including ecosystem demands—make community management of water supply provision tenuous without external support. What is clear is that for communities to play their role in the governance of the water resources in a sustainable and equitable way, external support from government, nongovernment, or even private agencies are required. Without support for community capacity building for both water service development and water resources management, poorer communities and their advocates will be ineffective in addressing the management and governance crisis in water.

Community Empowerment and Capacity Building: An Agenda for Action

The imperatives for overcoming barriers to community participation, management and empowerment are borne of the necessity to achieve sustainable water services and water resources. They ensure that poor communities genuinely benefit from these services and access to water resources, increasing the impact and effectiveness of development investments in poor societies.

At a time when resources from government and external funding agencies are being contested and fought for by every sector lucky enough to have an international target agreed by the international development community and national governments, resources will need to be used more effectively, with sustainability firmly set in the heart of any investment decision. This will require that resources be spent, not just on physical infrastructure, but also on building social infrastructure: on developing mechanisms for community participation, on building community management structures, and on activities that support the empowerment of individuals, communities, and their advocates.

For this to happen, the following actions need to be undertaken

- **Win the argument for community participation, management, and empowerment.**

NGOs, academics, community-based organizations, and water sector professionals must work hand in hand to gather the evidence and distill the lessons of successful community involvement in water interventions and its impact. This evidence should come from improved process documentation, regular monitoring and evaluation of activities, as well as targeted research activities using rigorous assessment tools. The knowledge generated from these various activities needs to be used to develop guidelines, manuals, and tool-kits for development workers and community members so that knowledge can be actively shared. Additionally, a review of current practices in water sector reform needs to be undertaken to assess how far community participation and management are being promoted and achieved, and what are the institutional, resources, and professional barriers to its adoption as an approach. Lessons from these knowledge-generation activities needs to be actively advocated by sector professionals and civil society groups to government agencies and funding agencies. Incentives for sector professionals need to be developed that encourage attention to social infrastructure building, and any disincentives need to be identified and checked.

Capacity-building programs such as the UNDP's CAPNet, Streams of Knowledge, and the web-based GWP Toolbox for Integrated Water Resource Management that focuses on government and sector professionals, need to be complemented by capacity-building programs focused on civil society groups, and preferably managed by civil society organizations, including national and international NGOs and networks such as the Freshwater Action Network, UWASNET in Uganda, and the NGO Forum in Kathmandu. These capacity-building programs, including cross-country exchanges of community groups and local civil society organizations, require support from the aid community.

- **Build capacity for genuine bottom-up participatory planning.**

Improve and strengthen skills, tools, and methodologies used by different levels of local governments to facilitate bottom up and participatory planning, which involves multiple stakeholders, including representatives of poor people themselves. Funds should be made available to local government units for building processes for participatory planning and budgeting.

To complement this, national and local level civil society groups need to build their capacity to get engaged. This will require raising awareness and knowledge of government planning, budgeting and decision-making processes, building skills for advocacy, improving access to information and ability to process information, and cross-sectoral networking among other civil society groups in the country. More attention then should be paid to developing advocacy capacity-building programs for civil society groups active in the water sector.

The PRS processes are excellent opportunities for heightening experience and understanding of government planning and budgeting processes, as well as for understanding the possibilities and constraints of community and civil society

participation. As more and more communities and their advocates gain experience in these processes, it would be necessary for water sector-based organizations to build links with other-sector based groups, and build their capacities in this way. Programs for strengthening water sector civil society capacity for advocacy in government planning processes need to be built up, with lessons from involvement continuously being documented, shared, and learned within the country and externally.

- **Scale up community management approaches.**

Since its beginnings in the early 1990s, community management has become widely accepted as a favored approach to rural community water supply schemes. But with over a billion people around the world without access to an adequate water supply, massive scaling up of the approach is needed. In addition, while an improvement on previous models, sustainability under community management is far from assured. Communities can do much, but not everything. They must not be left in a vacuum.

To achieve scaling up, the focus must widen from the community to its enabling environment. In particular the capacity of intermediate level support agencies (local government, NGOs, private sector) must be greatly increased. Communities need technical, financial, and legal backstopping as well as ongoing support in facilitation.

In addition, national and district level nonprofit NGOs need to improve their knowledge and skill in tendering for community water supply contracts. This could be addressed through training and guidance in actual preparation of tender documents. The experience could then be used, after some time, to improve the design of contracts themselves so that these do not unduly pose a barrier or undermine scaling up community managed water supply schemes.

Community management approaches will need to prove their comparative advantage to other management arrangements (public or private). Developing standards and benchmarks would be a way forward.

- **Develop more pilots of community participation in integrated water resources management at the river basin level and catchment level.**

There are still few examples of community participation and community organizations' involvement in basin and catchment level IWRM. As governments and development agencies attempt to develop the institutional mechanisms and structures for IWRM, attention should also now be paid to the role of community organizations within these mechanisms of management. Few organizations are involved, primarily at the micro-catchment level. More piloting needs to be undertaken to show how community groups can become involved, and what levels of support will be required to enable this involvement.

In conclusion, poor people have a right to water. This right can be exercised in their active participation in development of water resources and services. The task of development professionals is to help create an environment for this action.

3

Reaching the Poorest of the Poor

Dirk Frans and John Soussan

Background

During the last century, the water security of billions of people has improved. Worldwide, people have been able to overcome the crippling effects of endemic waterborne diseases and now have secure access to water for productive activities such as irrigation and fisheries.

However, at the same time, many more people than a century ago continue to suffer from water-related hazards. Their strenuous efforts to emerge from poverty are wiped out overnight by flooding, water-related diseases, or drought. The improvements that have been made and that will continue to be made will not reach all those in need. Indeed, as the global community works toward achieving the agreed upon goals of halving the proportion of people in poverty, who are hungry, and who do not have access to safe and affordable water and sanitation, an increasing challenge will be to reach those who are not reached by existing efforts: the poorest of the poor.

Efforts to provide rural and urban populations with clean drinking water, safe sanitation, and water for productive purposes have been particularly successful in reaching the moderately poor. The greatest successes have been achieved in countries such as many in Southeast Asia and Latin America that as a whole have been able to develop to a level where widespread poverty is largely a thing of the past (though pockets of persistent poverty may still remain). Success is not confined to these emerging nations, as even countries that remain poor overall have seen significant extensions in the availability of reliable domestic water supplies, irrigation systems, and so on. These successes have often been in places and for communities who are relatively less impoverished and who already had relatively better water security. In many cases, programs to improve access to water have failed to reach those with the least water security.

This pattern is similar to that in development activities in general, where interventions have often bypassed those in the most appalling situations. If nothing changes, the increased demand for water resulting from population growth and economic development, and the resulting pollution is likely to result in higher numbers of people living under extreme water stress. These people are likely to be in the most impoverished sections of society and who are least able to access water through conventional systems. The poorest of the poor have, by definition, the least assets to invest in improvements to water security. They also have the weakest social and political capital, the greatest difficulties in accessing institutions through which water programs work and the least ability to sustain any investments that are made once external support is withdrawn.

The challenge for the next few decades will be to find ways and means to ensure that programs reach those who suffer most from a lack of access to sufficient safe and secure water. The objective of this paper is to make visible the poorest of the "water-poor," to highlight the mechanisms that result in them being bypassed by mainstream water programs and to suggests ways in which those mainstream programs can be made more sensitive to the poorest of the water-poor.

Who are the Poorest of the Water-Poor?

Multidimensional poverty

Poverty is multidimensional. "Income poverty" is one of the most obvious facets of poverty, but by no means the only one. Lack of health, education, a supportive social network, access to natural resources and technical facilities, as well as limited freedom of choice and expression are all components of poverty. The UN Millennium Development Goals span the entire spectrum from income poverty and access to food and education, gender equality and empowerment of women, to child mortality and maternal health, major diseases, and environmental sustainability.

Who then are we concerned about in this paper? Who suffer most because of water-related problems? Which people feel farthest away from a solution? In the first instance, a classification of the poorest of the water-poor seems next to impossible. Individuals easily come to mind. A farmer in Baluchistan, whose one and only source of water has been clogged as the result of a heavy sand storm. The slum dweller next to a tannery in Dhaka, who has to buy all the water his family needs in jerricans because the water quality from a nearby source is akin to a sewerage system. The women in Sub-Saharan Africa who spend many hours daily fetching water from a dug well, or the street dweller in an American inner city, who has not experienced a shower for weeks. But systematically categorizing these diverse experiences is far from easy.

A livelihoods perspective

The "livelihoods approach" offers one way to analyze people's prospects of leading a life in which water is no longer a constraining factor, but an enabling one. The core of the livelihood approach is people's access to crucial resources. Those resources are grouped under five types of capital: human, social, natural, physical, and financial. Individuals and households use these resources to follow strategies to ensure their livelihood. They do so by engaging in activities, such as farming, out-migration, and manufacturing to make the most of the opportunities available to them.

Of the five types of resources, the financial differ from the others in that these can, to some extent, make up for lack of access to the other types. For instance, in the Rub-al-Khali desert of Saudi Arabia, water for drinking—let alone productive purposes—is extremely scarce. However, those involved in oil exploration in the area have such easy access to financial resources that, for them, water is no problem. One obvious characteristic of the poorest of the water-poor is that they do not have enough financial capital to make up for lack of other resources. The water-poor therefore overlap to a large extent with the socioeconomically poorer sections of society.

Types of poor and water-related entry points

The poor are not only many in number but also varied in their types and levels of poverty. To identify strategies that can help the poor overcome their poverty in general, and in relation to water in particular, they must be further differentiated.

The most common way of distinguishing the poor is on the basis of income and/or access to food. The "moderately" poor are those who have enough incomes and entitlements to cover their basic food needs. The "extremely" poor are those whose income is not even enough to get 85% of the minimal calorie intake to maintain a normal life style.

The Chronic Poverty Research Centre (CPRC) has suggested another categorization of the poor, mainly based on the duration of their poverty. The four categories of the CPRC are the occasionally poor, cyclical poor, usually poor, and the always poor.

Finally a categorization can be made based on the main cause of people's poverty, such as ecological vulnerability, a poor resources base, or demographic factors. This categorization is helpful inasmuch as it indicates the main entry point for outside support of the poor in their struggle for a better life. Table 1 makes use of these various categories to categorize the poor, identify their main water needs and vulnerabilities, and suggest water poverty reduction instruments.

The demographically challenged can be found in all societies and in all times. They can be water-poor because of old age, disease, or because they are physically or mentally challenged. Where they lack the support from a family structure and are part of the "floating" population, the government will have to ensure that their basic water-related needs are met. Because their needs are similar, internally displaced persons and refugees fall into this same category.

Demographically challenged persons, who have the support of families, are often better-off than their floating counterparts. Nevertheless, they depend on the care and goodwill of others and often lack both voice and entitlements to ensure that their needs are met. Enhancing water security of this category of water-poor will mainly be through welfare type interventions. In many societies this group of water-poor are traditionally taken care of by (extended) family members. In other societies the demographically poor would be taken care of by institutions with the level of care determined at a political level.

The resources-poor are people who have little access to the various forms of capital. A typical example is an illiterate, landless household belonging to a religious or tribal minority in a rural area with limited access to common property resources, such as fisheries or forest. Improving their situation would require structural improvements in their asset base, such as a multi-pronged strategy of developing their various forms of capital. Among others this might include skills training, improved access to credit, schooling, roads, and access to markets.

The ecologically poor are those who live in areas with relatively easy access to a sound resources base, but where that resources bases itself, or those living in that environment, are vulnerable. A case in point of such water-poor is a medium-sized farming family in an erosion-prone floodplain, hilly, or coastal area. While they may live above the poverty line for years, a sudden shift in the river course, a cyclone, or a landslide can wipe out much of their capital overnight. This group of poor would benefit particularly

from vulnerability-reducing measures. These may include early warning systems, a place of refuge for people and livestock, embankments where feasible, and post-disaster rehabilitation such as credit and seed supply.

As indicated above, the poorest of the water-poor in all three groups share the condition of financial poverty, which severely limits their options to enhance their water security. Therefore, appropriate support from outside the local communities concerned will often be needed to enable them to build up a secure livelihood in which their basic water needs are met in sustainable ways. However, such assistance is not automatically successful in reaching the poorest of the water-poor, as the next section shows.

Overcoming Mechanisms of Exclusion

Lessons learned

How is it that well-intended programs often end up excluding those who suffer the worst forms of water insecurity? In the past, most projects and programs were designed as top-down approaches. Typically specialists and bureaucrats would identify the problem, design a solution, and implement it. Such interventions were often inappropriate—and sometimes totally irrelevant—to the needs of the intended beneficiaries. Where this top-down approach is still practiced, a positive impact on the lives of local people is unexpected and the chance of the poorest benefiting is slim.

Ensuring a voice for direct stakeholders

Agencies have learned from their mistakes and nowadays, in more and more programs, direct stakeholders are consulted. However, at best a few local influential people are approached and it will not come as a surprise that their particular needs are then taken care of by the consultation process. Socially less influential sections of society and minorities among the direct stakeholders have little social capital and hardly any voice, let alone influence to make sure their needs are met.

A classic example of this is the placement of communal handpumps in a village in India. Local village leaders were consulted and there was unanimous agreement that the pump should be placed in the center of the village near the community center. It seemed to make perfect sense until an evaluation found that the women still went to the river a few kilometers away to wash their clothes. They refused to bath and talk among themselves in front of the community center where the men would regularly gather to sip tea and watch them.

Facilitating participation of the poorest

The latest interventions aim at real participation and rightly require direct stakeholders to actively take part in all stages of the intervention from initiation through operation and maintenance (O&M). This usually involves taking the initiative to galvanize local opinion to take action, file applications, get organized into informal or even formal groups, and show commitment by contributing part of the investment up front. However, the poorest of the water-poor are least able to actively take part because of their limited human capital. This is

Table 1. The Poor, their Water Needs, and Solutions[1]

Main Category	Ultra Poor		Poor			
Type of Poverty	Always Poor [2]		Usually Poor	Cyclically Poor	Occasionally Poor	
Source of Poverty	Demographically Challenged		Resource Poor		Ecologically Vulnerable	
Description	Persons incapable of work, not embedded in supportive family structures and "floating," such as: • Abandoned children • Physically and mentally handicapped • Internally displaced persons • War and natural disaster refugees	Persons incapable to work but embedded in supportive family structures or institutions, such as • Chronically ill • Physically and mentally handicapped • Elderly	Physically capable but: • Functionally landless • With homestead land • High dependency ratio • Few other assets	Physically capable and with a **minimal asset** base and also: • Heavily dependent on a single asset (labor power, captured fish) • Very vulnerable to all kinds of natural and man-made disasters and to diseases	Physically capable, with **moderate assets**, but: • Heavily dependent on natural cycles and the availability of a few natural resources such as fish, firewood, and rain • Vulnerable to minor and major natural and man-made disasters and to diseases	Physically capable with **reasonable assets** and **diversified livelihood options**, but: • Still vulnerable to major natural and man-made disasters and to diseases
Characteristics	The poorest of the poor	Totally dependent on the goodwill of others and with no voice and few entitlements	Always struggling to survive mainly because of a poor asset base	Depending on fragile assets and very vulnerable	Capable and sometimes above the poverty line but regularly slipping back	Moving in and out of poverty
Water Needs and Vulnerabilities	Lack of access to: • Safe and enough drinking water • Enough water to bathe • Safe sanitation	Lack of voice to ensure entitlement in case of shortage of: • Safe drinking water • Enough water to bathe • Safe sanitation	Lack of access to: • Safe drinking water • Enough water to bathe • Safe sanitation • Water for domestic productive purposes	Lack of access to: • Water for domestic purposes • Water for homestead-based productive purposes • Water-related common property resources	Lack of access to: • Water for domestic purposes • Water for homestead-based productive purposes • Water-related common property resources	Lack of access to: • Water for domestic purposes • Water for homestead-based productive purposes • Water for productive purposes on private property (land)

Table 1. The Poor, their Water Needs, and Solutions (cont'd)

Main Category	Ultra Poor			Poor		
Type of Poverty	**Always Poor** [2]			**Usually Poor**	**Cyclically Poor**	**Occasionally Poor**
Source of Poverty	**Demographically Challenged**		**Resource Poor**		**Ecologically Vulnerable**	
Main Support	• Safety nets • Public facilities • International assistance in case of large populations of internally displaced or refugees		• Subsidized household level facilities	• Partially subsidized, partially cost-based household level facilities	• Cost-based household level facilities	• Cost-based productive unit based facilities
Water Poverty Reduction Instruments	In **rural** areas (markets, refugee camps) strategically located • Public drinking water supply • Public bathing facilities • Public toilets, • All of these safe and appropriate for handicapped men and women and internally displaced people or refugees	In **family** situations • Awareness raising about the needs and rights of dependents • Increased access of the household to safe water supply and sanitation	In **rural** areas • Provision of subsidized safe drinking water • Provision of subsidized household level sanitation • Supply of subsidized water for homestead gardens and livestock	In **rural** areas • Provision of cost-based safe drinking water • Provision of cost-based household level sanitation • Supply of subsidized water for homestead gardens and livestock	In **rural** areas • Supply of cost-based water for homestead gardens and livestock	In **rural** areas • Provision of cost-based water supply for productive purposes
	In areas of **cities** with a higher percentage of floating people • Public drinking water supply • Public bathing facilities • Public toilets • All of these safe and appropriate for handicapped men and women and internally displaced people or refugees	In **institutions** • Awareness of staff about the needs of clients • Statutory assurance of minimum entitlements • Budgetary item to ensure provisions • All facilities safe and suitable for handicapped men and women	In **urban** areas • Provision of safe piped drinking water • Provision of subsidized common sanitation and bathing facilities • Where applicable, supply of water for productive purposes	In **urban** areas • Provision of subsidized safe piped drinking water • Provision of subsidized common sanitation and bathing facilities • Where applicable, supply of cost-based water for productive purposes	In **urban** areas • Provision of cost-based safe piped drinking water • Provision of subsidized private sanitation and bathing facilities • Where applicable, supply of water for productive purposes	In **urban** areas • Provision of cost-based safe piped drinking water • Provision of subsidized private sanitation and bathing facilities • Where applicable, supply of water for productive purposes

[1] After European Commission, D. G. E. R. 2001. *Country Strategy Paper – Bangladesh, 2002–2006.* Brussels, European Commission.
[2] Based on the terminology used by the Chronic Poverty Research Centre.

particularly difficult for those with little formal education or limited exposure to the workings of government or nongovernment agencies.

Making donor procedures participation-friendly

The poorest of the poor also lose out because, in spite of the rhetoric, many agency procedures do not allow time for real interaction with direct stakeholders. When they do allow time, procedures may not allow much change in plans to accommodate the views of the direct stakeholders, as many implementing agencies have sectoral approaches, set programs, yearly budgets, and targets to achieve, and are unwilling to adapt their own procedures to reflect the implications of a people-led approach. Too often participation is "added-on" to an existing program design, without the agency adjusting its internal procedures.

Here are two examples of this add-on approach: In a water resources management project financed by a development bank, participation was given highest priority. The time needed for such participation was however not taken into account when the disbursement schedule was prepared. The implementing agency was encouraged to ensure real participation but at the same time warned that the project would be declared "sick" if disbursements fell too far behind schedule, even if this was unavoidable for genuine participation to be included. In another case local people wanted a bridge over a channel, but because it was a "water management project," bridges (that have no water management function) could not be included. What was possible was a regulator made broad enough to allow vehicles to pass. The fact that, at that point, water management was not really needed was gracefully overlooked.

New approaches to those labeled "illegal"

In other cases, the poorest of the water-poor are bypassed because many of them live and work in what authorities call "illegal settlements." Examples are those who settle on embankments, along railway tracks, in reserve forests, and many who live in urban slums. Almost by definition, government agencies are not allowed to provide such "illegal settlers" with water supply, arrange sanitation, or otherwise offer services that would give safe living conditions. If one government agency were to assist such "illegal settlers," the slum dwellers—or their supporters—could use that in court to claim their legal right to stay. Nongovernment organizations (NGOs) often have more leeway to interact with those who operate outside the law of the land, but they too may be reluctant to risk government disapproval.

Subsidize the poorest users

Finally, the new drive toward privatization and greater efficiency among funding agencies is likely to exclude the poorest of the poor. After all, the poor tend to live in areas that are more difficult to work in, with the highest vulnerabilities, and they are least likely to be able to afford payment for services. With economic indicators gaining ground, agencies are likely to skip investments in areas with a lower internal rate of return, and more risk of delayed implementation, spiraling costs, on top of questionable locally financed O&M.

All in all it is not surprising that water security has remained a dream for the majority of the poorest of the poor. In this section we looked at the past as well as the way things are now. However, the focus of this paper is on the future and how the water security of the poorest of the poor can be improved. To do so we need to briefly look at relevant trends in the water sector.

Key Trends

From rural to urban

In many countries a major trend is people moving from rural areas to the cities. This migration trend will have major consequences for the kinds of technologies needed for water supply, sanitation, and water for productive use. High capacity piped domestic water supply and sewerage infrastructure will be needed to cater to the concentration of people in urban areas. While many people will remain in rural areas, the growth in numbers will be in the cities, which will need such modern technologies. Water supply and wastewater removal will also have to cater to industrial and semi-industrial production. With that, the needs will increase for wastewater treatment, reuse of water, and flood protection. With the concentration of people and assets in cities, large pumping stations will become necessary to remove wastewater and access rainfall.

From a subsistence to a monetary economy

In many parts of the world people are moving from subsistence activities to a monetary economy. This trend has major consequences for the livelihoods of the poor and for the mechanisms to assist them. Dependency on local common property resources is likely to decrease, undermining traditional ways of managing the natural environment in general and natural resources such as forests, irrigation systems, flood protection and drainage arrangements, capture fisheries in particular.

At the same time this trend creates new opportunities for people, even the moderately poor, to start paying for water supply services. That in turn is likely to increase the possibilities for sustainable operation, maintenance, and expansion of water services, but probably through nontraditional institutional arrangements. In urban areas this is likely to also attract private capital and management in water services. This may free up scarce government resources for areas or people that are less attractive to private investment: generally the poorest sections of society.

From male to female driven

In most countries, men head the households. Participatory strategies are therefore geared toward men rather than women. However, in the future, the number of female managed households and production units is likely to grow, both due to absence of the senior male and to female emancipation. Participatory approaches will have to become more geared toward women in all phases of water sector projects, from planning, design, and implementation to O&M.

From quantity to quality

Until now the main focus of the water sector has been on water quantity. With economic development, population growth, urbanization, and industrialization, the focus is likely to shift to water quality. This requires actions to ensure that poor communities have access to water supplies that do not jeopardize their health and a focus on the reduction of threats to ecosystems from pollution.

From natural to man-made vulnerabilities

Another trend is the shift from natural to man-made vulnerabilities. While natural rainfall, storms and floods were the focus in the past, in the future the main vulnerabilities will be from overall economic developments, chemical pollution, air pollution, etc. The solutions for such problems will be different from those in the past, with a much heavier emphasis on looking at the root causes and preventing those man-made vulnerabilities in the first place.

From local and regional to international conflicts

Finally, in the future conflicts over water are likely to move from the national to the international level. With that, the poorest of the poor will feel even more unable to influence decisions. Finding solutions to such transboundary conflicts will be more complicated and time-consuming than solving local or regional conflicts over water.

Ensuring the complexities do not overwhelm the voice of the poor

Together these trends are likely to result in a different and more complex reality in which individuals, communities, and nations will compete to enhance their water security. At the same time developing nations may be able to learn from the process that urbanized and industrialized nations have gone through during the last century. How will the poorest of the poor fare in these new circumstances? Unless something new is done their voice will remain unheard and their needs unmet. However, that is not inevitable as the strategies in the next section indicate.

Strategies to Reach the Poorest of the Water-Poor

The situation differs from country to country and even within countries. The following strategies are therefore not applicable everywhere. Based on its own geographic, social, and legal environment, each country will have to develop its own set of strategies to ensure that water resources management becomes pro-poor. The critical issue of more effective targeting for the specific needs of the poorest of the poor, which are typically different from those of many other sections of society, must be more effectively addressed. It cannot be assumed that improvements to water management are pro-poor, and even actions that will benefit many poor people may still not reach the poorest of the poor, whose low asset base, social standing, and capabilities may prevent many strategies from reaching them. There will typically need to be a distinctive strategy, with different assumptions and actions, if the water security of the most deprived sections of society is to be improved.

Partnerships of key actors are crucial, as alleviating water poverty is only one of the many facets involved in reducing poverty. Sustainable water resources development and poverty reduction requires change in access to resources, change in behavior, and new organizational arrangements to ensure ongoing O&M as well as their financing.

Pro-poor water governance

What can organizations interested in reaching the poorest of the water-poor do to enhance their water security? Several strategies come to mind. The first and foremost strategy is to *place poverty reduction at the top of the agenda.* Only when reaching the poor is the overriding goal can all the other real obstacles along the way be overcome. The policy statements of the major aid agencies, and many developing nations, now in fact give poverty reduction the highest priority. If practice follows rhetoric, then the single most important precondition to enhance the water security of the poorest of the poor will have been met.

National government *policies must be made coherently pro-poor.* An example of what is lacking related to water sector interventions is land acquisition. In many water schemes, water infrastructure is built without proper compensation of those negatively affected. Large dams, which have displaced between 40 and 80 million people in the last half of the 20th century (World Commission on Dams 2000), are the obvious example. Land acquisition should not only be compulsory but should also reflect market prices, compensate tenants and others having de-facto usufruct rights, and be completed on time. Existing laws often do not include these provisions and are on conflict with national level policies and requirements of funding agencies. Project-affected people should be compensated or otherwise assisted in such a way that their livelihoods improve compared to the pre-project state. Ideally their situation should improve in line with that of the project beneficiaries. More appropriate and sustainable ways of compensation have to be found than through cash, as most poor households lack the skills to use cash effectively.

The next most important strategy is to *identify and geographically and socially locate the extreme poor.* Who are the water-poor? Where do they live? What is their social status? What are their main livelihood strategies? What resources do they have? What do they see as the main bottlenecks in the process of enhancing their water security? Answering these questions is a precondition for action and the answers will have to be given at the international, national, regional, and local level. For maximum impact, resources and effort will have to be prioritized and allocated according to need.

Once the water-poor have been identified, they *must be given a voice in all stages of interventions.* How to do that is not yet totally clear. The ADB-led Water and Poverty Initiative (WPI) has identified best-practice case studies. In some of these success stories. Local government institutions (LGIs) play a crucial role, while in others it is NGOs or community-based organizations (CBOs). This experience must be synthesized to the point where a number of approaches can be specified, including the circumstances under which they are likely to succeed. However, even when successful approaches are known, flexibility in implementation and further experimentation will be needed.

To make best use of limited resources, ways must be found to *better target the poor.* Governments will have to partially subsidize the poorest households and communities to enable them to make investments to improve water security. These subsidies can be either in the investment itself or in the institutional arrangements that support the investment. At present, either form of subsidy often ends up benefiting the rich more than the poor. New ways must be found to ensure better targeting as well as appropriate phasing out of subsidies.

Another strategy is to develop *self-targeting mechanisms* that favor the poorest of the water-poor. Such mechanisms already exist in certain microcredit and food or cash-for-work programs, but more innovation and experimentation is needed in the water sector. Water supply and sanitation are obvious areas to develop self-targeting mechanisms, but they are also needed in the use of water for small-scale production (mini-pond fisheries, small-scale irrigation, etc.) and reduction of vulnerabilities.

Strategies must be developed to enable the poor to *graduate from subsidies and outside assistance to self-financing.* With improved livelihoods and water security, people should be able to gradually start sharing the burden of operating and maintaining the systems that have allowed them to grow out of poverty. To date there are not many examples of successful graduation processes and those that do exist, such as in many industrialized nations, have very long time frames. Analysis of the water sector history in those countries may yield some clues as to what works and what can speed up the process.

In some cases, ensuring pro-poor water resources development requires *transboundary agreements.* Because of the existing lack of enforceable laws, transboundary effects on the poor often are much larger than those within a nation. An example is the number of people negatively impacted by India's unilaterally constructed Laxmanpur barrage. This displaced over 15,000 people while 6 hydro-projects within Nepal displaced less than 11,000 people (Gautam and Rana 2000). International agencies have a major facilitating role to play in this respect.

Finally, key actors in the water—and development—sector will have to *better coordinate* their activities to ensure that they become mutually supportive. National governments have to create an enabling legal and regulatory environment, as well as appropriate procedures to ensure that policies are actually implemented. Funding agencies will have to ensure that their various policies are coherent and supportive of the overriding goal of poverty reduction. Partnerships will have to be formed to ensure that direct stakeholders have a major say in program design, that optimal use is made of local knowledge, that implementation is done by capable and committed staff and organizations, and that appropriate and timely funding is available. This should not lead to more red tape, but to action-oriented programs. These should result in some immediate improvements in the water security of the poorest of the poor to motivate all concerned. At the same time there should be a clear long-term process leading to sustainable water security for all.

Improved access to quality water services

With all the stress on pro-poor governance it is easy to forget that the poor are particularly interested in very *down-to-earth improvements* such as improved access

to quality water services. There is no time to wait until all the necessary national and international institutional arrangements are up to standard, agencies reformed, and acts and laws improved. *Action is needed now* and along the way improvements can be made in a step-by-step fashion.

Improved access to biologically and chemically *safe drinking water* remains the number one priority. In countries with high levels of pollution, for instance by arsenic, this is a major challenge. Here the horizon should shift from the medium to the long term and all options—including piped water systems—should be explored.

Second priority is increased access to safe and sustainable *sanitation*. This will be a challenge particularly in urban areas with high population and poverty densities.

Third priority should be access to water for *productive activities around the homestead.* This facet of water use has been neglected until now but has major poverty reduction potential.

The fourth priority is improved access and use of water for *agricultural production.* Given the fact that agriculture uses more than four fifths of all sweet water, the emphasis should shift to improving utilization, i.e., more crops per drop.

Pro-poor economic growth and livelihood improvement

Improved water management is a necessary, but on its own insufficient precondition for poverty reduction. Access to safer, more and better water will only yield its full poverty reduction potential when the livelihoods of the poor are improved along a broad front, including reduction of "income poverty."

Some countries have made remarkable and consistent progress on the economic front, including a relatively equal sharing of the benefits across the different socioeconomic classes. However, most countries have seen much less growth and a concentration of income in the hands of a few. Therefore, *pro-poor economic growth is a must.*

Poverty is multidimensional and so are the livelihoods of the poor. Poverty reduction therefore requires not only an improvement in people's financial assets but also in their natural, physical, human, and social assets. In all these areas the people themselves have a responsibility, but it is also clear that their scope for improvements are limited. *Government assistance* is needed to protect the environment, build the necessary physical infrastructure, and assist people in maintaining a healthy life, growing in awareness, gaining useful skills, and strengthening their social networks.

For pro-poor economic growth and livelihood improvements to flourish, *indicators of success must be developed that reflect these priorities.* This implies measuring the impact of interventions on the extent and level of poverty reduction rather than, for instance, the internal rate of return or the cost/benefit ratio. For instance, in the case of a fisheries program, the pro-poor development of many small ponds would be measured as more successful than the most cost-efficient development of a few large ponds belonging to rich households. Furthermore, there should be a move away from measuring inputs and outputs toward the actual impact in the lives of the poor.

Community capacity building and empowerment

Stakeholders' participation is a nice idea but will not get off the ground unless the *stakeholders are organized and empowered.* Traditional organizational forms and management arrangements worked well when communities were isolated, small and relatively homogeneous, hierarchies unchallenged and as long as time was at hand. In the 21st century, life is far more dynamic and complicated and other, much more powerful actors are involved in decision-making.

It is not possible here to go into the details of the necessary capacity building and empowerment. Nevertheless two things need to be highlighted. First of all empowering direct stakeholders should go beyond the traditional elite and *include the poor, social, religious and political minorities as well as women.* Secondly, direct stakeholders should not only be involved in issues related to their own locality but also in *developing policies* and in implementing and monitoring them.

NGOs and CBOs should be encouraged to make arrangements that will help them *identify and assist the poorest of the poor* in their locality. Local people are often in a much better position to identify the poorest than outsiders are, be they from an NGO or a government organization. NGOs and the government should develop mechanisms to support such local initiatives through special procedures to provide services such as microcredit, and care for orphans and old people.

If *participation is to become meaningful,* four things have to happen simultaneously:

- The capacity of direct stakeholders to interact with indirect stakeholders and do so within the national, legal framework has to be built up systematically.
- The capacity of indirect stakeholders, particularly government agencies, to implement a participatory, bottom up approach to development, has to be created.
- The direct stakeholders have to be empowered by giving them considerable, if not decisive decision-making power.
- By implication the current power-holders, such as national and international agencies, will have to be partly disinvested of that power.

Disaster prevention and mitigation

The impact of natural disasters upon the poorest of the poor is disproportionately high, in part because they are often in the most vulnerable locations and in part because they are the least able to take actions to reduce their vulnerability to these threats. Governments will have to invest in disaster preparedness, and provide lifesaving infrastructure and post-disaster rehabilitation *packages that are relevant and accessible to the poor.*

In the case of man-made disasters, the first and best approach is to *prevent such disasters* from happening in the first place. This requires appropriate legal provisions to ensure that if an individual or a legal entity causes negative impacts on others, the perpetrator is held legally responsible. Environmental legislation must ensure that during the planning and design phase of all but the smallest

interventions, negative affects are identified and alternative arrangements investigated. The aim should be to minimize negative impacts wherever possible.

If, in spite of the attempt to minimize negative effects, some residual effects remain, then the law must ensure that *necessary mitigation measures are taken*. These should ensure that project-affected people are compensated or otherwise assisted in such a way that their livelihoods improve compared to the pre-project state. Ideally their situation should improve in line with that of the other project beneficiaries.

Management of the environment

The move away from subsistence to a monetary economy and from a local to a regional economy results in a breakdown of the strong traditional basis for community management of the local environment and its resources. It is also becoming clear that many local interventions have negative impacts hundreds of kilometers away. In the process, negative components of activities that benefit a person or community in one place may be diverted to others who are unaware.

In the future, environmental management will have to *move from the local to a more regional, national, or even international scale.* This will require changes such as:

- A much higher level of awareness as to how their local activities can impact others, as well as willingness to avoid or minimize negative environmental impacts.
- More stringent legal provisions protecting the environment accompanied by measures to enforce compliance.
- New organizational arrangements that facilitate interaction between up and downstream users in all stages of interventions, from identification to implementation and O&M.

These new arrangements can build on a still well-developed awareness of the environment among many in developing countries, including the poor, especially the rural poor. However, this awareness may be lost within a generation and before that, action should be taken to ensure that the new organizational arrangements build on this existing awareness.

Conclusion

If water resources management continues to follow a "business as usual" approach, then the poorest of the poor will surely be left out. Experience in retrospect and existing trends leave little doubt that "more of the same" will result in many more people either remaining in or slipping back into poverty.

At the same time there is hope that if the poor themselves are involved in designing solutions, and if their needs get top priority, millions can move out of poverty. Water security for even the poorest of the poor is achievable. This paper highlights the various strategies and interventions that are available to reduce water poverty. What is needed is a concerted effort by key actors, through partnerships for action, to apply these strategies on the ground.

Where there is a will, there is a way.

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4

Understanding Gender, Water, and Poverty

The Gender and Water Alliance

The changing roles of governments from providers to facilitators imply that communities now have the responsibility to manage their own water resources. If communities are to manage these resources effectively, efficiently, and equitably, the men and women of the communities must have a voice and a choice in the decision-making process. Having a voice and a choice requires an understanding of the differentiated roles and responsibilities of women and men in the community, and recognizing that they do not have the same access to or control over resources and that work, benefits, and impacts may be different for both groups. Understanding these roles also require attention to the complex relationship between productive and domestic uses of water, to the importance of participation in decision-making, rights and obligations in the management of resources, and to the equitable distribution of costs and benefits from improved infrastructure and management structures.

Water is a remarkable substance—central to life, it feeds our nations, drives our industry, washes away our troubles, quenches our thirst, and brings beauty and pleasure into our lives. Yet it is an unfortunate aspect of the nature of water that it flows toward power. Thus it is always the powerless, the most vulnerable, who lack access to water, be it water for drinking, or for productive purposes. A gender-sensitive approach is necessary to correct at least one element of this inequitable flow pattern.

Understanding gender is about understanding a set of relations, including power relations, which define social function on the basis of sex. Gender is, therefore, a social not a biological construct, and thus gender relations can be changed. While gender relations are not inherently oppressive, all too often they are, in fact, oppressive of women.

A gender-sensitive approach to water management allows one to unpack the different roles and relationships of men and women in the management of water. But, as Marx once said, the purpose of understanding the world is to change it—presumably for the better. A gender-sensitive approach to water management should not just facilitate an understanding of the different roles of men and women, but also an understanding of when and how these roles need to change in order to facilitate equal participation in decision-making by men and women, and in order to ensure equal access to the benefits of water.

Gender and Water

Improved services: domestic water supply

Two concepts influence decision-making on water access and affordability. The concept of water as an economic good implies that those who get water delivered to them, or who discharge waste into a watercourse, should pay for the service they get, or the damage they cause. Yet water is also conceptualized as a fundamental human need, which has to remain accessible to everyone.

Water delivered to fulfill basic needs—for drinking, cooking, hygiene, and production of subsistence food—should remain a priority, affordable to households with the lowest income levels, many of which are female-headed. A reliable water supply ensures that poor households have more time to engage in income-producing activities, better hygiene, and lower health-care costs.

Within communities, however, there are significant differences among social groups in the kind of services and facilities they require and can afford. In general, women want public water points located near their homes, preferring connections within their houses, so as to reduce the time and energy spent on the acquisition of water. Distant water facilities increase women's and girls' workloads, sometimes placing severe stress on their health and their capacity to take advantage of educational and training opportunities.

Where good water is scarce and men and women need it for different purposes such as household use and cattle, competition and conflicts over its division are common. Conflicting interests over water and land use in catchment areas of community water supply systems also have an increasing negative impact on the availability and quality of drinking water.

When users are expected to pay for water delivery, they must therefore be consulted as to their ability and willingness to pay. Feasibility studies and marketing research must be carried out on a cross-section of the population, broken down by class, sex and other characteristics. In this way, a wider range of options can be offered to match the different demand-levels of women and men.

Meeting demand does not stop at the installation of services. Creating a system for accountability is necessary. But sometimes women do not have the opportunity to hold the service provider accountable, since they are not present at the appropriate meetings. Attendance and voting in assemblies focused on domestic water services are still often reserved for male household heads. Channels used for information and communication, such as public meetings and written materials, are also male oriented. As a result, the knowledge and expertise of women cannot play a role and its value not acknowledged.

In addition, within households, women and men are often responsible for paying different household bills. Intra-household expenditure for water often lies within the female domain of responsibility. Though the women may be motivated to pay for water, they usually have lower financial resources than men. Water supply projects can become much more effective if women's and men's complementary intra-household roles and perspectives are taken into account at both the design and implementation stages.

Lack of water is a determinant of poverty. This has a devastating effect on millions of households throughout the rural developing world, as well as in rapidly expanding towns and cities. A high proportion of those households are

headed—or primarily sustained—by women. In millions of others, lack of water and waste management—for which women are principally responsible—inhibits women's capacity to protect their families' health and to enhance their productivity. Since women are significantly overrepresented among the poor, lack of water and of a clean, safe environment contributes to the feminization of poverty and to the entrenchment of poverty generally.

Environmental sanitation

The lack of safe disposal of human and industrial wastes is the main cause of the growing contamination of water resources and high costs for water treatments. Since the International Water Decade (1981–1990), half of the world's population still do not have access to improved sanitation. Poor sanitation is also a serious threat to the cleanliness of the environment and the water resources used for the supply of drinking water. Lack of proper sanitation has led to high loads of bacteriological contaminants in surface water resources.

While good drinking water has a high political priority, sanitation has a lower priority, and the consequences of poor sanitation are definitely felt more by women than by men.

Having no proper means for excreta disposal is a great inconvenience. Women and girls in particular face problems of distance, lack of privacy, and personal safety. In the choice of technology, design and location of sanitation facilities, these are not necessarily the same for all households. For instance, women want latrines to be suitable for children and easy to clean, while men want them as they increase the family's status. Environmental sanitation can also increase women's work. For instance, extra water collection or cleaning falls only to women and girls.

In the growing role of the small-scale private sector, private latrine builders are now a common sight in many countries. This again provides an opportunity for women to increase their incomes if given the opportunity to access training and receive equal payment.

Improved services: food security

Many studies in different countries have shown that, in poor regions, food security is often dependent on women's agricultural work. While men are involved in cash crop production, it is the women who grow vegetables and maintain livestock to feed their families or sell in local markets. Poor women are also involved in small-scale agro-industry as a means of subsistence for themselves and their families.

Water provision in irrigated production is generally controlled by men. Men are also able to influence associations that are responsible for infrastructure, water allocation, and scheduling. Irrigation, ranging from hand watering to irrigation systems of various sizes, may lead to an increased production of crops managed and controlled by men, and/or increased production under women's control. Increased production may be used to supplement the family diet or raise family income through the sale of crops.

Irrigation often affects local labor patterns within and between households as well as the control over labor resources. Landless male laborers may see their opportunities for paid labor increased with a growth in irrigation; for women, such paid labor tends to be more seasonal. The introduction of irrigation into a region often creates more work for women and children in sowing, transplanting, harvesting, storage, etc. This leads to an increased work burden for them when other chores are not reduced.

Whether the increase in production leads to an increased income depends on the marketing opportunities, as well as on who gets and controls the income. In many societies, there is no single control household purse, and income from irrigated crops is not necessarily used for general family consumption. Often women contribute labor, but the men sell the products and keep the money.

Irrigation and the development of an agro-industry often have implications for existing land rights and tenure practices. Men may try to reallocate or control land managed by women. As a result, women may lose control of their section of family land or land traditionally allotted to them. The combination of lower production of subsistence crops and loss of income can have dramatic effects on family health if heads of households limit the funds available to women.

Women are therefore often a vulnerable group when water is reallocated to higher-value uses. They risk losing access to water. A gender-informed strategy has to be devised to consciously take into account women's needs, so as to ensure that they receive a fair share of this development resources and its benefits. Government policies or private sector investments may change local resources management practices. Thus, it is crucial that investment planning takes into account potential effects on women's abilities to use and manage resources for subsistence and for their economic development. Women should therefore be involved in the planning, decision-making, and implementation of such activities/projects.

Ecosystems management

Water pollution refers to the contamination of water bodies and their substrates when pollution exceeds their self-purification capacity or their sink capacity for pollutants.

In every community, there are learning systems by which local knowledge is adapted in the light of new information and transmitted through dialogue and participation. Most often, women are the controllers and purveyors in local learning systems related to water, health, and sanitation—as is revealed by their use of indigenous knowledge systems on managing quantity and quality. Indigenous management of water resources is especially noticeable where water shortages necessitate careful handling, or where a highly developed water culture exists, perhaps involving religious beliefs and practices regarding water sources and water handling.

As women are usually responsible for providing their families with water and food, the need to protect ecosystems is very much internalized: Functioning freshwater ecosystems undertake various ecological services, directly paying back on the long-term protection of living conditions (e.g., self-purification of water, water storage, or conservation of biodiversity, etc.).

In many countries, small-scale fishery is a woman's field of economic activity. Local communities usually operate within a set of informal rules that regulate sustainable use of resources. When export-oriented processing factories enter the fishing scene, local women and men often lose opportunities. Fish prices rise beyond the means of local consumers. Women then lose both their sources of income and their sources of food. International capital invested in export-oriented activities should therefore also be invested in developing local capacity and infrastructure, particularly building on the local knowledge and expertise of the women.

Increased watershed sustainability, rehabilitation of ecosystems, and sustainable livelihoods can be made possible if women have access to the watershed. Unless women watershed users groups initiate and manage their own resources, the situation will remain unbalanced in favor of men and vulnerable to overuse. Since poor women often have traditional technical knowledge in managing watersheds, enhancing their financial and managerial powers will offer them a role in current water management and pollution prevention which is based on equality rather than domination and on cooperation rather than competition.

Public awareness, education, and dissemination of water-culture information are also important elements in the creation of sustainable water pollution abatement strategies. Local and regional cultural values and taboos sometimes contribute to polluting activities. But traditional values can also be powerful tools, entrenching antipollution practices—if the right actors are given the right, gender-sensitive training and facilities.

Livelihoods improvement

Everyday, innumerable women still spend substantial amounts of time carrying home domestic water for the family. Water collection reduces the time available for income-generating work and is a drain on household labor resources. Domestic water projects are generally designed with only such domestic uses in mind. Common objectives are improving welfare and health. This places domestic water projects firmly in the social or health sector and not in the sector of economic development. Yet if women's water collection were valued at paid labor, it would have high economic costs. Women themselves see domestic water services also as an opportunity for economic development. Especially where gains are substantial, "Poor women … feel [that] time spent ... should contribute primarily to the family income."

A more reliable domestic water supply combined with increased economic opportunities and a supportive environment not only has a direct impact on the income of the poor but also reduces their vulnerability during times of adversity. Research carried out in the semiarid areas of India have tested the assumption that in semiarid areas, domestic water projects are not only important for welfare and family health, but also have economic benefits.

The results show that on average, women spend 3 hours of their time on fetching water. With others helping, it brings the total average time spent on water collection to almost 5 hours a day. This is still considerable time spent for water collection in a situation where, on paper, all households have year-round access to a piped domestic water supply meant to reduce the drudgery of water

collection. In these areas, women provide income to the family in four ways: by doing agricultural work on the land of the household, by engaging in expenditure-saving activities (e.g., fodder collection and vegetable gardening), by hiring themselves out as daily wage laborers, and by doing microenterprise work. The work in the micro-enterprises provides family income at crucial times: in the dry season when income from other sources is absent. During the monsoon as well as summer, women spend significantly more time on income-generating activities.

The quality of the water service has significant economic consequences. Breakdowns of the water supply cause women enterprise members a loss at an average of Rs50 per person per month in earnings. In addition to financial losses, women lose, on average, 7 hours per month in the summer, for reproductive and/or personal activities. An improvement of the water supply to the extent that women spend 1 hour per day on collecting water would result in an improvement of their annual income with upper boundaries of between Rs750 and Rs5,520 depending on the type of enterprise and local conditions. Alternatively, each woman might gain between 45 and 152 8-hour days annually for domestic, social, and management activities.

On all accounts, participation in community level affairs is higher for women in enterprise households. This applies to attendance of public meetings in their own and other villages, speaking up at such meetings, and being a women's leader in their own village or a cluster of villages. Women in enterprise households are furthermore involved in the management of community water resources. Gender relations have changed. More women go out alone and more children go to school. Men refer to economic benefits for the family as a whole, a greater equality between the sexes, and women's empowerment as improvements in women's traditional roles.

Therefore, combining effective income-generating projects for women with an improved, well functioning domestic water supply results in valuable extra income for livelihoods and improved gender relations. The design and management of most water services have not been adjusted to the economic use of water and time savings. When women have no say in planning and design of services, and no influence on water distribution, service hours and speed of repairs, valuable productive time, water use, and income is lost and the service does not maximize its economic potential.

Disaster management and mitigation

Water-related disasters affect the poor to an overwhelming extent. It is the poor who usually experience most of all the loss of life, property, livestock, livelihoods, crops, as well as water-related diseases.

For disaster management and mitigation to succeed and to decrease human vulnerability, it is crucial to take into account the different needs of women and men. Among the poor, women and children are the most vulnerable. In fact, they are 14 times more likely to die in a disaster then men.

Disaster management and mitigation programs are more effective when women are viewed, not just as victims, but also as individuals who can actively participate in response strategies. Women play a key role in household livelihood systems.

Effective flood and drought protection-and-mitigation strategies cannot be formulated without an understanding of their roles and responsibilities. Settlement plans need to incorporate women into discussions and negotiation with local communities. Here, it is important to understand how land-use and land-tenure systems affect settlement patterns, and where changes in these could be used to encourage women and men to move to safer areas.

Educating women in disaster management and mitigation contributes to the comprehensive well-being of the community. Oftentimes, men are not even present when disasters strike. Thus, training in disaster preparedness, response, and recovery needs to be geared toward women at the community level, as well as toward men.

Why Gender Mainstreaming?

The examples given show that because of the differences in production, labor, responsibilities and resources, women and men have different interests in and benefits from the availability, use, and management of water. As a result they often have different criteria to evaluate the adequacy, equity, timeliness, convenience, and quality of various interventions as well as different perceptions about the costs and benefits related to participation in the use and management of water resources.

Although the importance of strengthening the role of women in the management of water resources has been mentioned in the various international conferences dealing with water resources management (New Delhi, 1990; Dublin, 1992; and Rio de Janeiro, 1992), the instruments through which water resources are being managed and the issues which are being emphasized, in fact, tend to weaken the position of women in water resources management.

The principles formulated and advocated by the international community, such as regarding water as a social and economic good, and the management of water resources at the lowest appropriate level, are not gender-neutral and therefore should be analyzed more in terms of gender specific consequences before widespread implementation. This is why gender mainstreaming is required. What is gender mainstreaming?

Gender mainstreaming is the process of assessing the implications for women and men of any planned action, including legislation, policies or programs, in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring, and evaluation of any said action, so that women and men benefit equally.

Integration of Gender in Policies and Programs: The Next Steps

It is important to stress that there is no one gender policy, no one blueprint that can be applied to all cases. However, several key questions underpin any gender-sensitive approach to water management, be it at the community level, or at the catchment level.

- What are the needs and problems of men and women (and of poor men and women relative to the privileged)? Interventions should reflect and respond to the needs of poor men and women and not only to privileged technocrats who may assume that they know the answers. We must learn to listen and

learn from poor men and women. Poverty does not equate to stupidity any more than being female does. It is often said that we need to give a voice to the poor. In fact, poor men and women have voices, and know what it is that they want to say.

- How will men and women (especially poor men and women) make their voices heard and take part in decision-making?
- Who has the information? Information is power, and those who hold the information, therefore, hold a powerful hand at any negotiation and decision-making.
- Who does the work (be it work on a new water supply project or work in terms of walking a long distance to collect water for the household)? This question also needs to look at who is paid for the work that they do, and who contributes unpaid work.
- Who makes the decisions?
- Who will bear the costs?
- Who will reap the benefits (water benefits, employment, etc.)? At the community level, one needs to unpack the gender issues of cost and benefit to ensure that it is not, for example, poor men benefiting at the expense of poor women—a result that is possible when a community is assumed to be homogenous.
- Who is most at risk from lack of access to water, and who is made vulnerable by the lack of water?
- Are there macro-level policies that have impacts on the nature of water use by women and the poor? For example, pricing policies might price small farmers out of the market and poor women in particular; or financial policies make it impossible to develop infrastructure where users cannot afford to pay for it. It is difficult (but perhaps not impossible) to implement pro-poor, gender-sensitive water management within a set of macro-level policies that are inherently unsupportive of this approach. Pro-poor and gender-sensitive macro-level policies, on the other hand, greatly facilitate the implementation of a similar water management approach.

Pro-Poor Governance, Management, and Participation of All Stakeholders

Past experience in water resources management has demonstrated that even a people-centered approach does not automatically ensure that women's and men's needs and priorities are reflected in programming (SIDA 1998). Thus, emphasis on mainstreaming gender perspectives should be systematically incorporated into all international, regional, and national policies and programs.

A user-oriented and demand-driven water supply system can only meet the needs of its customers when these customers are capable of expressing their needs to water authorities. Women and men at different socioeconomic levels need relevant information, so they can make informed decisions regarding their choices and the costs they are undertaking. Women have a particular need for information on possibilities for participation in negotiations with suppliers, and on their legal rights, in order to enhance their bargaining power.

If the principle is accepted that water is an economic and social good that should be managed at the lowest appropriate level, services must be planned on the basis of demand from future users. Gender-disaggregated data must be used to determine the effective demand within different social strata. Projections on the effects and efficiency of water-related services and programs should be based on analysis that takes into account the activities of both women and men: as consumers, service managers, employees of public and private utilities, engineering and health professionals, and village-level water-managers.

Organizations concerned with the water sector at all levels (from bilateral and multilateral to district and local) should mainstream gender within their water management strategies. This requires conscious attention to gender aspects in all policies, programs, administrative and financial activities, and in all organizational procedures.

Water sector policies have to reflect women's needs, priorities, and representation-rights in relation to all possible water-use options. A gender strategy with clear goals, objectives and targets, aimed at access for all, should aim at balancing different water uses through integrated watershed management. Where there are conflicting needs, those of the women have to be recognized and respected. Policies have to explicitly aim at preventing the reduction or denial of access to water, land, credit, etc. on the basis of gender or ethnicity.

Since women comprise a large segment of the users of water facilities, an adequate proportion of the membership of all decision-making bodies and water-management committees should be female. Generally, a one-third proportion is regarded as creating the requisite critical mass for the interests of a group to be effectively represented. Where representation is unbalanced, affirmative action is needed over an agreed period, governed by clearly established criteria. To ensure quality representation of women's interests in decision-making bodies and management structures, careful analysis is required to ensure equality in the distribution of work, paid opportunities, skills-development and capacity-building initiatives, as well in as the benefits of any planned action.

Adequate women's participation in decision-making bodies in the water sector has to be ensured at all levels:

At the international level

Existing gender-informing water networks and professionals should be consulted and a sufficient number of women delegates should participate in international decision-making bodies.

At the national level

National water sector policies have to consciously reflect women's needs, priorities, and representation-rights related to all possible water-use options. A gender strategy aimed at inclusion for all stakeholders has to aim at balancing different water uses through integrated watershed management. Where there is competition for water resources, respect for women's needs must be guaranteed. Access to water can be impeded or denied, so social exclusion on the basis of gender or ethnicity has to be prevented. Equitable access to water must be ensured when water is reallocated to higher-valued uses, since, in those cases, the women are the ones who are most likely to lose access.

Some countries operate pluralistic legal systems. In these, customary law may grant women different water rights from formal legislation. Care has to be taken that women-friendly provisions in customary law are integrated into the legal framework being designed to govern the water sector.

At the district level

Drinking water is a strategic resources that can become a major factor within local power struggles. Women are often unaware of their right to participate in decision-making bodies. They must be made aware of this right for demand-driven supply systems to be effective.

At the local level

Women are important users of the water infrastructure and should therefore be included in local decision-making bodies in the water sector. However, cost and benefits of participation in water management institutions are often different for men and women. Recognition of these differences and their accommodation through adaptations of the rules and procedures of institutions is crucial to ensure that women have a voice.

Conditions affecting female participation in water committees and management structures differ between rural and urban areas. In rural areas, high female illiteracy rates are a major constraint to women's participation and this is often used as a justification for exclusion. In urban areas, women are less organized and often uninformed about their legal rights. Recognition of these differences and their accommodation through adaptations of institutional rules and procedures is crucial for ensuring women's participation.

Building Partnerships to Mobilize Financial Resources

Water services cost money. In many countries, it has been accepted that water is an economic good. But water is also a public and social good, essential to the society at large and vital to a healthy environment and human dignity. Cost recovery for water supply is a new idea in some countries and water-users' rights are not well known. Beyond that, religious and customary laws persist in some regions, declaring free water for immediate drinking purposes as a basic human right. Water for the poor is regarded as a basic human need that has to be met, since water is essential for the survival of every human being.

Among the poor, women, children, widows, and orphans generally form the majority. If these groups cannot pay water tariffs, they may be forced to continue using water from polluted sources, thus thwarting efforts to eliminate waterborne diseases (e.g., cholera, typhus, etc.).

Cross-subsidizing or life-band-respecting water tariffs should be integrated into demand-oriented water management, thus ensuring access to affordable water by the poor. Governments, which carry out essential water management functions, can use available tools, such as legal prescriptions, economic and other incentives, and higher tariffs, for those who use water for commercial purposes and can therefore contribute more to the optimal management of water.

Water management systems that include participation at the lowest appropriate levels can support efforts to make safe water affordable to low-income groups.

The community has to understand its options and needs to be willing to take responsibility for the system. Men and women, belonging to all social groups, have to be involved in selecting the type and level of service, as well as the financing, maintenance, and management systems which enable them to participate. The system of co-financing chosen must also ensure that contributions in cash and kind are fairly distributed.

Service provision must be based on what people want and are willing to contribute to. At the community level, institutional capacity to manage the development, operation, and maintenance of the system must be enhanced. Governments should examine their budgets for water provision and assess what proportion should be spent on social aspects—such as strengthening the management capabilities of both women and men through training to fulfill old and new roles.

The level and type of service also influences expenditure for water supplies. Water prices directly affect household budgets, and in many societies, it is the woman who has to pay for water from her own budget, since resources-pooling within the family is not common. In some countries, there is a tendency that men and women maintain separate income and expenditure. There is also considerable variation in the extent to which husbands and wives share the task of providing for the material needs of their households. Men often meet long term-needs, while women contribute household goods and food items, including water.

When women's effective demand is properly assessed, the risk of improved facilities falling into disuse is reduced.

The choice of water-saving and low-cost options, and the use and transfer of innovative technologies (such as the latest irrigation techniques which increase field efficiency) can also help to prevent the installation of unaffordable and unsustainable water infrastructure.

Capacity Development, Technology Transfer

Technical and economic sustainability of water infrastructure is an important factor in water security. Involving users in management and decision-making helps to ensure that systems meet consumers' demands and those they will be used and maintained. Community-based as well as traditional methods for the management of drinking water and irrigation are often well supported. But even if community-based structures are well accepted at the lower levels of a water supply management system, they require skills from people who generally have little formal education or management experience. Female illiteracy rates are very high in many countries.

Therefore, for water systems to be sustainable, members of local organizations have to acquire the capacity to act as water managers. Time and resources are required to train management committees to run water supply systems and water resources management bodies. As women are often the most direct users of water facilities, involving them in management and decision-making help ensure that the systems meet their needs and that they contribute to sustain them. This demands an increase in technical and scientific education offered to women.

Both men and women's views on technological options have to be considered in order to find socially appropriate technical solutions. Water-sector white elephants now litter parts of the developing world: nonfunctioning water pumps, dried-up wells, and leaking irrigation systems. They tell tales of neglect in preventive maintenance. Due to the lack of a small spare part or the non-detection of a little damage, a whole water system may fall into disuse. Such breakdowns primarily affect women. They end up trudging great distances to get their household water and therefore have the most motivation to keep water systems working.

If women are well integrated into the organizational and management structures of water supply systems, there is a better chance that those systems remain technically sustainable, since, in most cases, it is the female part of the population that comprises the final users of the water infrastructure. A quickly detected and repaired damage to some part of a water supply system can prevent large-scale water losses as well as heavy destruction when there is uncontrolled flooding.

As women are often the most direct users of water facilities, involving them in management and decision-making helps ensure that systems meet their needs and guarantees their contribution to sustaining them. They should therefore be the focus of initiatives to build capacity for performing managerial functions. These should include development of skills in financial management, decision-making, community participation, leadership, confidence-building, and communications. Site management, caretaking, local administration, operation and management—all constitute opportunities to creatively use local capacities to develop sustainable community-based systems to maintain water facilities.

Time and resources are required to train personnel working in water-related regional and national bodies, NGOs and private water companies, so they can acquire skills in gender analysis and strategies for implementing a gender approach.

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5

Poverty, Water, and Health

Guy Howard and Amaka Obika
(Water, Engineering and Development Centre)

Introduction

Water is an essential component for sustaining life, maintaining health, and ensuring sustainable livelihoods. The United Nations General Comment on the Right to Water identifies access to water as a human right with, as a consequence, requirements placed on governments to ensure that action is taken to fulfill this right.

Access to water as part of a wider framework of resources or "capital" is essential for sustaining livelihoods. Available evidence points to the adverse consequences when such water is not available for use. Within some definitions of poverty, access to domestic water supply is one descriptor as part of a wider social component of poverty classification.

Poor communities tend to suffer the greatest health burden from inadequate water supplies or poor water management and as a result of ill-health are unable to move out of a cycle of poverty and disease. Poor households expend a disproportionate amount of their income and resources on medical treatment for easily preventable diseases. This income is then not available for investment in activities that would be more productive.

The importance of water in improving health and reducing poverty has been well established for well over 100 years and yet many of the world's population remain lacking access to basic services and resources that would protect their health and improve their wealth. The improvement of water supply and reducing health burdens remain major objectives in the global fight against poverty as articulated in the United Nations Millennium Development Goals.

Poverty and Health

The links between poverty and health are well-established. From the earliest development of the "sanitary revolution" it has been recognized that poor households suffered the greatest health burden and indeed a significant driver of the sanitary revolution was to address ill-health among the poor. Studies in both developed and developing countries continue to point to the greater health burden carried by poor households compared to their better-off neighbors.

The relationship between poverty and health is complex and operates through a number of direct and indirect factors, affecting both communicable and noncommunicable diseases. Poverty is often associated with increases in exposure to agents that cause communicable diseases. Poor families frequently live in

contaminated and degraded environments where pathogens (microorganisms that cause disease) and toxic chemical agents are abundant and often in high concentrations in the air, soil, and water. Such environments also often support the development of habitats that allow breeding of vectors that transmit diseases such as malaria and dengue fever. At the same time, services that provide protection for public health, such as water supply, sanitation, and drainage are often less well developed, have a lower quality of service, or are of high cost or poor reliability. In addition, the quality of housing and overcrowding increase the likelihood of infectious disease transmission.

Poverty increases vulnerability or susceptibility to disease. Poor people tend to have lower levels of nutrition and increased disease burdens. This in turn increases the likelihood of further infection as immunity is suppressed. Undernutrition is the risk factor leading to the greatest disease burden based on current estimates. Poor nutrition is linked to disease both through cause (increased susceptibility to disease) and effect (for instance it is a common sequel to repeated diarrheal episodes). Undernutrition may also increase susceptibility to adverse health effects from toxic chemical (e.g., arsenicosis also appears to be influenced by nutritional status).

Poorer communities and households tend to be more malnourished, because of limited incomes that prevent acquisition of foods of higher nutritional value and, in rural areas, because of the lack of access to good quality land, and often, to water to support improved agricultural practices. Children specifically infants are at particular risk of infectious diseases because their immune systems are not completely developed. Within the group at greatest risk, significant protection against diarrhea can be obtained though the breast-feeding of infants. This not only provides benefits to nutrition and the child's immune system, it also reduces exposure to infectious agents contained in contaminated water used to prepare formula preparations.

Poor communities are also commonly associated with higher noncommunicable disease burdens. Rates of depression, heart problems, and other illnesses are frequently higher in poorer communities than their wealthier neighbors and this appears to be true in both developed and developing countries. In addition to exerting a significant health impact in their right, noncommunicable diseases also frequently increase vulnerability to communicable diseases through suppression of the immune system.

Water and health

Water is an essential requirement for health. It is needed to maintain physiological functioning, to grow and cook food, and to maintain personal and domestic hygiene. The lack of access to water for use by households is closely linked to disease, both directly (e.g., poor domestic water supply) and indirectly (e.g., poor nutrition resulting from lack of access to water for irrigation). The effective use of water in activities that promote good health and are protective against diseases is therefore essential to the improvement of public health.

The importance of access to water is mirrored by the importance of removing excess water and the waste produced from its consumption, which can be

described as environmental sanitation. Good sanitation, water, and hygiene can prevent much of the morbidity and mortality from diseases such as diarrhea, poliomyelitis, hepatitis A, roundworm, whipworm, and hookworm. The impacts of a lack of sanitation are more acute in urban communities because they tend to be much more densely populated and there is less space to dispose of excreta and wastewater.

The role of water and environmental sanitation in preventing disease is profound. Although some interventions (e.g., use of oral rehydration salts) may be effective in preventing mortality, they often have limited impact on morbidity. The emphasis within the health sector is placed increasingly on integrated measures of health that incorporate both mortality and morbidity, the most obvious example being the disability adjusted life years (DALYs) measure employed in the Global Burden of Disease study. The advantage of such measures is that they recognize that morbidity is an important health outcome in its own right and that long-term morbidity results in significant loss of healthy life.

In relation to domestic uses of water, current estimates indicate that 5.7% of the global burden of disease is attributable to water, sanitation, and hygiene. Although there is recognition of the importance of a range of adverse health outcomes related to water, this figure principally refers to diarrheal disease. The majority of this health burden is borne by poor households living in developing countries and by children under 5 in particular.

Diarrheal disease contributes significantly to the high infant mortality rates commonly found in developing countries and poorer communities. The overall diarrheal disease burden is primarily carried in developing countries. It is the second highest cause of DALYs within developing countries, but does not reach the top 10 causes for developed countries. This clearly illustrates the importance of the relationship between water and sanitation, health, and poverty. Diarrheal disease, in common with other infectious diseases such as tuberculosis, are very much diseases of the poor, whose reduction should form an important component of poverty reduction.

The United Nations Millennium Development Goal to "reduce by two thirds the death rate of children under 5 years of age by 2015" requires large-scale investment not only in ensuring protection against childhood diseases through immunization, but also large-scale investment in water and sanitation. Experience has shown that reducing this disease burden is achievable through relatively simple interventions to improve water supply, excreta disposal, and personal hygiene. Therefore, to meet the goal of reduced infant mortality will require a substantial further investment in water supply and sanitation.

The costs of ill-health

The economic costs of infectious diseases are enormous. In the US, the cost of endemic gastrointestinal disease is estimated to be up to $913 million taking into account medical costs and time taken off work. Although comparable estimates are not easily available for developing countries, the level of disease suggests that the costs when calculated on a per capita basis will exceed those of the US.

The impact of disease may in fact be much greater on poor households in developing countries. While in developed countries the costs of disease (both in terms of expenditure on medical care and in lost earnings) are offset through payments to health insurance or social security, in developing countries, no such safety nets exist. These costs must then be borne by poor households whose available assets are already very limited. Expenditure on medical treatment will often therefore result in forgoing expenditure on other items, which among the poor will typically include essential items such as food and education.

Ill health will also lead to the loss of time spent on income-generating activities, which may have further impacts on poverty. In households that are primarily engaged in the monetary economy, the often transitory nature of employment means that time taken off due to sickness is not recompensed. In many cases, time away from employment due to ill-health may not only result in suspension of income but may also prevent reemployment by the same employer in the future. This then necessitates the further expenditure of money to find work once health is restored. In very poor urban communities, even limited periods of sickness may result in a rapid spiral into further poverty, sometimes to an irretrievable degree.

Similar patterns of effect from ill health may be found in households who engage in agriculture, when sickness during critical times of crop production may result in loss of crops and subsequent hardship. This is exacerbated in areas prone to periodic drought or flooding as loss of harvest may result in reduced nutrition and suppression of immune systems, leading to further illness and loss of productive time.

Cost Recovery and Subsidies

Cost recovery within the water sector remains an important objective. Under-resourced services ultimately fail to sustain themselves beyond relatively short working lives. Cost-recovery is likely to be achievable where the quality of service is sufficient to encourage payment for services. Thus, an emphasis must be placed on ensuring that there is investment to improve service quality as well as cost recovery.

However, assessments of how costs should be shared and recovered is narrow and fails to take into account the broader benefits to society of improving access to water and sanitation services or improving equity in access to water resources. Cost-benefit analysis of water supply as a social service often neglects to adequately cost the financial burden of ill health (in terms of lost productivity, expenditure on medication, and restrictions on economic development). If such costs are included, then the benefit of improving access to water resources and environmental sanitation tend to be cost-effective and a case can be made for controlling costs to end-users while maintaining financial support to service providers. It is important, however, that services are managed effectively and in such a way as to increase service quality in line with demands and within acceptable costs.

Cost-recovery often results in aggressive disconnection policies to deal with nonpayment. From a health perspective, however, disconnection from public water supply is highly undesirable and the UN General Comment on the Right to Water makes it clear that unjustified disconnection contravenes the basic

right to domestic water. Where disconnection rates are high, this implies that either service quality is inadequate to encourage payment, tariffs are set unrealistically high, or that the billing practice fails to take into account local income patterns. Just as cost-recovery policies should be set, so policy should establish what level of disconnection is acceptable and what penalties may accrue to suppliers with excessive numbers of disconnections.

There is much criticism of the use of subsidies in water supply and past experience in many developing countries has been that it is the wealthier parts of society that have benefited rather than the poor. However, although there are increasing calls for removal of all subsidies on water and sanitation, this may be counterproductive when trying to address the health burden derived from poor services. If subsidies are used, these need to be targeted at those most in need of such support and subsidy provided to households rather than the supplier of services. Subsidies should, however, primarily target aspects of payment that are problematic, particularly capital-intensive investments, rather than applying to all aspects of payment.

Domestic Water Supply and Sanitation

Improvements in water supply require interventions to provide both adequate quantity and quality of water used for domestic purposes and ensure that the water provided is used effectively for personal and domestic hygiene. There has been an extensive debate over a number of years regarding the relative benefits of different interventions and various studies, meta-analyses, and reviews have been reported at various times. The striking point about most of the evidence presented is that any one intervention has a very wide range of impact, from virtually zero to very significant public health gains. The principal lesson that can be drawn from these studies is that the impact of a particular intervention is locality-specific and depends on the predominant route of transmission. Therefore, understanding local patterns of disease is of greater benefit than trying to apply generic models of intervention strategies.

Improving access to domestic water supplies and sanitation remains a major component of poverty reduction strategies. In achieving the Millennium Development Goal for water, however, not only does the level of investment need to be considered, the approach adopted to deliver such improvements must also be focused on meeting the demands of unserved and underserved communities.

As of 2000, it was estimated that 1.1 billion people lacked access to an improved water source within 1 km of their home. Virtually all these people reside in developing countries, particularly within rural communities, although the rapid urban growth within developing countries may yet result in declining numbers of people with even this level of service. These are the same countries where preventable health burdens from water and sanitation diseases are the highest.

The priority in the water sector remains to ensure that those populations currently lacking access to this basic level of service are provided with such services. This requires ongoing commitment to investment by governments, communities, and development partners. Parallel investments are equally required to address the urgent need for sanitation for the 2.4 billion people worldwide who currently lack access to some form of improved sanitation and for action to improve hygiene behavior.

In communities where infrastructure is provided at the basic level of services, there is good evidence of the effectiveness of low-cost, household-focused interventions to achieve available health gains. Reviews of evidence have shown that hand-washing with soap and treatment of water within the home both yield significant reductions in the incidence of diarrhea. The use of such approaches as a medium-term measure to reduce health burdens should attract further support.

The delivery of such household-focused interventions demands new approaches to health-related water and sanitation activity. The products promoted need to be attractive to consumers and therefore the role of marketing and product development is increasingly important. The private sector, often at the micro and meso scale, will be likely to have a significant role in promoting uptake and may provide the driving force of innovation required for developing and sustaining interest in these products. Promotion of household-focused approaches is likely to require reorientation of the policy environment to allow for the incorporation of the private sector into the mainstream of interventions.

Although the development of household-focused strategies offers significant potential for reducing a significant proportion of water-related diseases, it is important that these are seen as only an incremental stage in the provision of domestic water and sanitation services. For instance, the use of household treatment systems do not obviate the need for collection of water from communal sources, which may result in sustaining some adverse health consequences and restrict the ability of women in particular to develop more productive livelihoods. Therefore, the short-term gains available from incremental household-focused interventions should not form any barrier to the delivery of broader improvements.

Improving sanitation requires further investment and to date, although some progress has been made in increasing access, sanitation coverage lags behind water supply coverage. The declaration made during the World Summit on Sustainable Development in 2002, to halve the proportion of people without access to improved sanitation by 2015, highlights the need for new strategies for promoting and delivering sanitation.

The relatively poor level of uptake is related to a lack of understanding of what users value in sanitation facilities, lack of awareness among communities about the benefits of sanitation, and a resulting lack of demand and low levels of water supply service. Experience has shown that uptake of improved sanitation facilities are more likely in households with adequate water supply (house or yard connections).

The key to improving uptake and coverage of sanitation is creating and stimulating demand, and setting up mechanisms for responding to expressed demand. Demand creation could be achieved through sanitation promotion using techniques such as social marketing. This involves understanding the sociocultural framework in which people live and investigating what motivates different categories of people to invest in improved sanitation facilities. More recent studies indicate that barriers to adoption of sanitation are not necessarily cost-related, but include issues such as lack of awareness, operation and maintenance of different technologies, and inadequate water supply. However, access to credit facilities and targeted subsidies plays a major role in improving demand and uptake of sanitation especially to the poor.

The role of the private sector in delivering sanitation facilities is beginning to gain more support. However, it is important to bear in mind that the private sector (e.g., informal latrine providers) may not necessarily have the capacity to deliver effective services without further support from the public sector and NGOs. It is therefore necessary that flexible policies be made to create the enabling environment for public-private partnership with clear definition of roles and responsibilities.

Increasing Access to Higher Service Levels

The available literature indicates that the majority of the public health gain from domestic water supply is accrued once the water supply is delivered onto or very close to the plot on which the house stands. The reasons for the health gain are complex and include increased quantity of water for hygiene, increased allocation of water for child hygiene, increased time for food preparation and child care, and better control of water quality. In current estimates, the proportion of the population with access to this level of service is only 47%, suggesting that the engineering interventions in water undertaken to date may have had relatively limited impact on public health.

The delivery of water supply at this level of service should be a goal for the water and health sectors, and particularly in urban areas, may be achievable without any incremental stages in provision through communal water sources. The challenge in developing such levels of services for rural areas will be more difficult, although there are potential ways forward as discussed below.

Urban areas

In achieving improvements in access to higher service levels, it is obvious that as a first step, the water supplies should have sufficient quantity of water available in sources, within system storage and extent of distribution infrastructure to meet demands for water. In many developing countries these basic requirements are currently not met. In many situations, significant improvements in the ability to meet demands are obtainable through reducing losses from water systems through leakage control programs and by reducing commercial losses from inefficient billing and collection. It is not uncommon to find that unaccounted-for-water exceeds accounted-for-water in urban piped water supplies in developing countries. Recovering this lost water would provide much of the water to extend services into new areas. Reducing leakage may have additional benefits from reducing the likelihood of the ingress of contaminated water into the supply, which may lead to disease outbreaks.

In many towns and cities in developing countries, the costs involved in acquiring a connection at the plot or higher level of service continues to function as a barrier to uptake. Total costs of acquiring a connection are frequently greatly in excess of the available working capital of most poor families. Costs are entailed not simply in the payment of connection fees, but in purchasing materials and labor to survey, install, and connect to the water supply. As these costs are typically required up-front, they act as a disincentive for households to connect to water supplies, as the high investment cost is compounded with delayed benefit.

One of the greatest problems facing poor households is their vulnerability to economic shocks caused by loss of employment, crops, or other basic resources

required for survival. One consequence of this is to reduce financial risk-taking and to limit expenditures on items that may be obtained from other sources. In urban areas, one consequence of reduced risk-taking by poor households may be the avoidance of water supplies that have a risk of long-term debt, such as those provided by utilities that issue bills on a relatively infrequent basis. This promotes the use of alternative water supplies, often of lower quality, which result in continued high rates of disease.

Creating more incentives for households to connect demands action within the financial management of water suppliers and a change in philosophy toward the population being served. Although many utilities espouse the maxim "the customer is king," many continue to fail to develop a client-oriented and demand-responsive approach, particularly in relation to poor households. There is also a lack of recognition that demand may need to be created.

There may be several ways in which such incentives can be created. This may include subsidizing connections, which may then be offset by increases in unit tariffs. This has been successfully applied in some African towns and provided significant increases to the proportion of the population with an on-plot level of service. Subsidies may not be required—for instance creating better access to credit would improve the ability of many poor households to acquire a connection. This may involve improving formal sector financial institutions, but could also focus on the development of informal sector financing. For example, many west African countries have mutual benefit societies that could be encouraged to provide credit to members for acquiring a water connection. This may have an additional benefit in that defaulting rates would be expected to be significantly lower than for other credit institutions.

The important aspect of all potential approaches is that creation of more flexible and attractive options requires innovative thinking to develop and offer solutions, perhaps a package of options, which matches the client profile in terms of income patterns. In addition to making connection more attractive and feasible, systems of billing should also become more responsive in recognizing that income patterns of poor households are often uncertain. By allowing deposits to be made on a regular basis, problems faced by poor households when faced with large bills at infrequent intervals can be overcome.

Other innovative approaches are developing that offer significant potential for increasing the proportion of the population without their own connection. One approach that appears to be particularly good is the use of shared connections among small numbers of households. This will result in levels of service that promote health gains but are more affordable to acquire because costs can be spread across several families.

Rural sector

Within the rural sector, expanding access to water supplies at higher service levels is more problematic as the per capita investment costs will usually be higher. Most current approaches to rural water supply emphasize a community-management model and this may place restrictions on the ability of rural water supplies to extend to a yard level of service. Increasing the levels of service may require a more professional approach to water supply management and the need

to include paid technical staff. The experience in developed countries with small rural water supplies, which would typically offer an in-house or at least yard level of service, suggests that this is difficult to sustain without external support.

In developing increases in access to water supply at the plot level in rural areas, ways in which operation can be improved are required. This could include, for instance, the promotion of private sector management of rural supplies with contracts entered into by communities and a management contractor. Within this approach, government bodies can act as a regulator of the management contractors and offer third party verification of performance. The use of water users associations and alternative management models may offer a distinct advantage over the more traditional concepts of community management.

The Need to Improve Operation and Maintenance

O&M is often poorly executed in water supplies and many water supplies fail within a relatively short time after construction. The impact of poor O&M on health is often more important than the adequacy of initial designs, as the often rapid deterioration in services results in increasing health risks.

In rural areas, poor O&M may be related to the imposition of supply-driven solutions with little reference to the preferences of end-users, inadequate training of community operators, and lack of appropriate tools to perform the necessary tasks. It has been noted in a number of projects that key determinants in the success of project exit strategies is the degree to which local operators are equipped to perform basic maintenance.

Within utilities, O&M often poor and is reflected in high leakage rates, poorly developed repair and replacement strategies, and little planned maintenance. Such problems are not unique to poor countries, but may also be found in many wealthier countries and reflect an overall low priority accorded to O&M by policymakers and managers. Increasing attention on asset management should assist in directing investment into better O&M. Delivering improvements in O&M should be driven by policy requirements to maintain good performance and by regulations that define allowable levels of water loss.

Independent oversight

The independent oversight or surveillance of water supplies provides an important mechanism for evaluating the health-related risks related to water supply and in identifying whether particular social groups or communities are disadvantaged in relation to water supply. Experience in both urban and rural areas of developing countries has shown that surveillance programs can be supportive of improved O&M and reducing water-related health risks.

To be effective, surveillance programs should address a range of indicators that allow conclusions to be drawn regarding the risk posed to public health from the water supply. These include water quality, access and use, continuity (reliability), cost, service level, and leakage. These indicators and their means of measurement have been validated in field activities throughout developing countries.

In urban areas, poverty can be directly incorporated into the program design of surveillance, and multi criteria zoning methods allow vulnerable groups to be identified and prioritized. Such approaches typically include measures of poverty,

population density, and water supply service (both as service level and as type of source). It is important that in developing such approaches, all forms of protected water supply are considered for inclusion within data collection programs and that water quality testing extends to the household.

In rural areas, simple approaches can be developed that can support improvements in O&M by communities. Circuit-rider programs, where staff from a dedicated agency make regular visits to remote communities, have been shown to be effective in supporting community-management in developed countries. In developing countries, surveillance programs in rural areas have also proved to be effective in promoting better management of community-managed water supplies. In developing countries, rural water supply surveillance programs need not attempt to visit every water supply on a frequent basis, but rather to develop programs of rolling visits of supplies with an emphasis on lesson learning.

The development and implementation of surveillance programs require greater support within developing countries, particularly for poorer communities. The process of information collection and analysis can prove highly effective in promoting change and improvements in water supply and water handling hygiene.

Establishing Water Safety Plans

Controlling of the safety of water remains an important aspect in the protection of public health. There is recognition within the water and health sectors that the traditional approach relying almost exclusively on testing of indicator bacteria to determine health risk from water supply does not protect public health. The use of risk management approaches building on good practice in the water sector (for instance the application of the multiple barrier principle) and focused on the means of assuring safety rather than measuring potential indicators of safety, offers a more practical and effective approach to safety management.

In the third edition of the WHO Guidelines for Drinking Water Quality, a quality assurance approach called Water Safety Plans has been developed to provide a framework for improving water quality and safety control. This approach takes a catchment to consumer view of safety and identifies actions and measures required throughout this process to ensure that domestic water is safe for consumption and use. Rolling-out of these programs offers significant potential to improve water safety in all forms of water supply and under all forms of water management. Again, these approaches can allow poverty reduction to be an explicit objective and support improvements in basic water security to all.

Water Resources and Impacts on Health

Overall, agriculture is by far the greatest user of water worldwide and the water requirements to grow food typically exceed by a factor of up to twice the basic minimum suggested for domestic use of 50 liters per person per day. In more arid areas where water is particularly required for food production, ensuring sustainable access to water resources to supply irrigation needs is critical.

Rural poverty in many parts of the world is closely related to the ability of households and communities to have access to adequate resources (in terms of both quality and quantity) to support the production of crops for direct consumption and for sale. As with domestic water supply, inequity in access to water resources results in inequity in socioeconomic status. Such inequity is not

solely a function of unequal intercommunity distribution of resources, but also intra community allocation of abstraction rights. Resolving such issues is an important component of sustainable rural development. It should be noted, however, that access to water is only one aspect of ensuring sustainable food production and issues such as land rights and tenure, cropping techniques, soil quality and conservation may all be equally important.

The benefits of access to water for agriculture on health link closely with nutrition, particularly the avoidance of undernutrition or malnutrition. In developing countries with a high mortality a rate (child and adult), undernutrition is the risk factor associated with the greatest burden of disease and contributes to a range of diseases.

Recommendations for nutrition typically work on food pyramids, which are designed to provide a properly balanced diet. Where growing sufficient foodstuffs to support nutrition is reliant, even in part, on access to water for irrigation, the minimum water required to support household irrigation clearly becomes an essential prerequisite to support health. The role of agriculture in concentrating existing environmental health risks must also be considered. For instance, there remains some debate as to whether irrigation of crops with arsenic-contaminated water may lead to uptake through the food chain.

Agriculture is also one of the major causes of pollution of water bodies worldwide. Pollution from agriculture may be biological, chemical, or physical and leads to both adverse health effects and environmental degradation. There are several pathogens that may be derived from animal feces and if these enter drinking water sources may represent a significant risk to public health. The pathogens include the *Cryptosporidium parvum* and *Campylobacter* species.

The protection of water sources against direct contamination by animal faeces is an important component of ensuring water safety. This will yield benefits in reducing direct health consequences of consuming polluted water. Reducing the number and frequency of incidence of disease will also contribute to improved nutrition and reduce susceptibility to disease.

Agriculture also contributes to ill-health on a wider scale through contamination of water resources by agrochemicals, which accumulate at levels that are toxic. Of particular concerns are contamination by nitrate and pesticides. Water resources can be protected through the application of groundwater protection zones, buffer zones, and catchment management plans.

The agricultural use of water is linked to health through providing habitats for vector breeding and hence increasing burdens of diseases such as malaria and schistosomiasis. In current estimates, 200 million people worldwide suffer from schistosomiasis. Malaria is responsible for over 42 million DALYs. Malaria may have particular impacts on pregnant women and its control is important in reducing maternal mortality.

The control of vector-related diseases can be achieved through a combination of engineering interventions to reduce habitats, interventions to reduce exposure, spraying to kill larvae, and medical treatment of sufferers. The use of bed-nets dramatically reduces exposure to mosquitoes for instance and could significantly reduce health burdens and improve productivity.

Conclusion

Water, poverty, and health are closely linked. Poor access to domestic water and sanitation leads to increasing levels of disease and contributes toward continuing poverty. Access to broader water resources and effective management of those resources are essential to reducing health burdens and promoting sustainable livelihoods. Reducing water and sanitation-related health burdens is achievable at a relatively low cost and will contribute to reducing poverty. To achieve increases in access, more flexible and innovative approaches are required to promote uptake of services and to develop incremental improvements.

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6

Water for Food Security for the Poor

Intizar Hussain, Namara Regassa, and Samad Madar
(International Water Management Institute)

Introduction

During the last 40 years, the growth in global food production has outpaced population growth. Cereal prices in real terms in the global markets have been falling. Apparently there is an abundance of food in the world. Nations or households with the means to buy food generally have no problem acquiring all they need. Yet, the stark reality is that in virtually every country there are communities and groups of people who suffer from endemic undernourishment and lead lives of persistent food insecurity and want. According to a recent Food and Agriculture Organization estimate, there are about 800 million people in the world who suffer from inadequate diets. The majority of them (about 770 million) live in developing countries. The prevalence of undernourishment is more pronounced in Sub-Saharan African and South Asian countries where some 28% and 24%, respectively, of the population do not have a secure access to a minimum quantity of food to sustain an active and healthy life. These are also regions with the highest incidence of chronic poverty.

These countries are facing severe problems of hunger, malnutrition, rural unemployment, land degradation, population explosion, and rural migration to overcrowded urban centers. In spite of economic reforms, a recent World Bank study acknowledges that structural adjustment programs in Sub-Saharan Africa are not generating a sustainable supply response in agriculture, particularly from smallholders (Donovan 1996). In some instances, the escalation of fertilizer prices, the failure of public sector credit systems for smallholders and problems in marketing services have created new challenges for smallholders. It follows, therefore, that enhancing the capacity of public sector institutions to spearhead more rapid agricultural transformation for smallholders is a matter for urgent attention. Moreover, the majority of these countries are still rural, and it follows that the focus should be on smallholders to ensure that the benefits of development are broadly distributed. In the developing and transition countries, almost 1.2 billion people, or about one out of four, live on less than $1 per day. Most of these people, including children, work long hours at physically demanding jobs just to survive.

An FAO study on the cost of hunger and malnutrition to the national economy showed that “Eliminating, or at least significantly reducing, poverty in a country will have an important impact on the growth rate of its GDP. Increasing the

daily energy supply to 2,770 kcal ppd in a sample of countries that were below that level could increase the average annual GDP growth rate by some 0.8%. This gives an idea of the magnitude of cumulative growth losses in countries suffering from malnutrition."

A study in the US has shown the existence of the relationship between food insufficiency and school functioning. The results indicated that intermittent experiences of food insecurity and hunger were associated with impaired school performance, tardiness, absenteeism, and higher levels of hyperactivity in children. Children from food-insecure households are more likely to show behavioral, emotional, and academic problems on standardized measures of psychosocial function.

Understanding the Food Security Issue

Poverty, food insecurity, and vulnerability are closely related concepts or phenomena and therefore their meanings have to be clarified at the outset. Food security, food insecurity, and vulnerability are aspects or correlates of poverty. *Food security* is a situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for any active and healthy life. Food security includes at a minimum: the ready availability of nutritionally adequate and safe foods and an assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, or other coping strategies). Food security is an essential element of overall human well-being.

Food insecurity, the opposite of food security, is a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level. Food insecurity may be chronic, seasonal or transitory. Food-insecure people are those individuals whose food intake falls below their minimum calorie (energy) requirements, as well as those who exhibit physical symptoms caused by energy and nutrient deficiencies resulting from an inadequate or unbalanced diet or from the body's inability to use food effectively because of infection or disease. An alternative view would define the concept of food insecurity as referring only to the consequence of inadequate consumption of nutritious food, considering the physiological utilization of food by the body as being within the domain of nutrition and health.

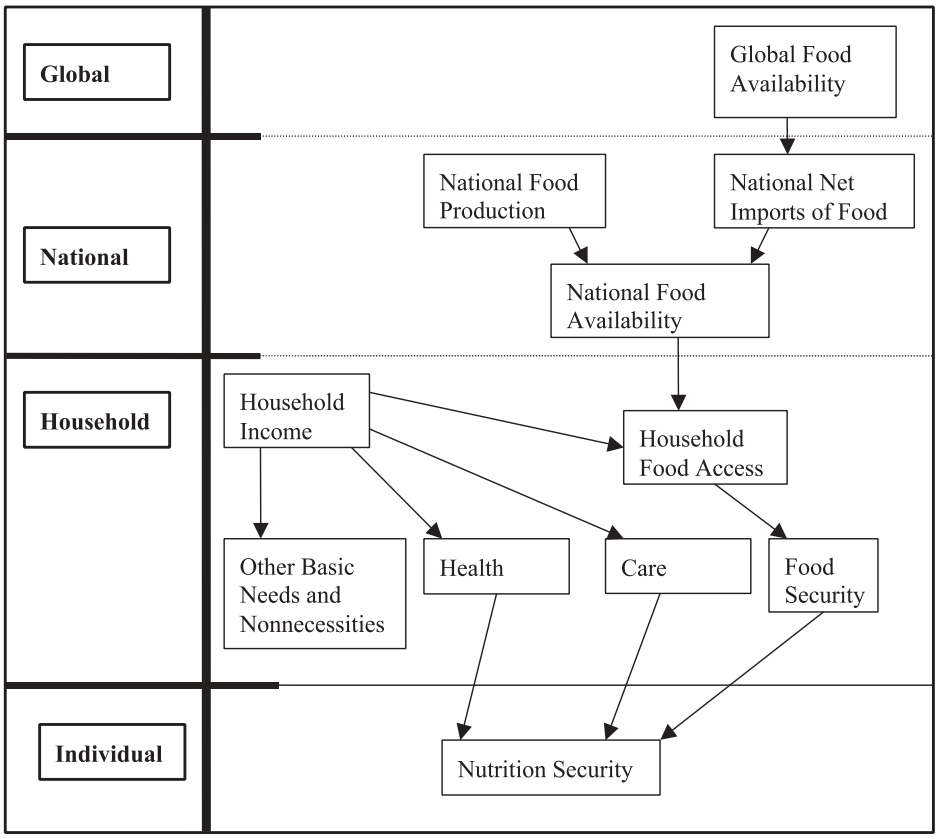
Vulnerability is the presence of factors that place people at risk of becoming food insecure or malnourished, including those factors that affect their ability to cope. A related concept is what is known as a vulnerable group—a group of people with the common characteristic, of either being food insecure or at high risk of becoming food insecure. The degree of vulnerability of individuals, households, or groups of people is determined by their exposure to the risk factors and their ability to cope with or withstand stressful situations.

The concept of food security has evolved over a period of time. Until the early 1970s, adequate availability of food-grains at the national level was considered a good measure of food security. Emphasis was placed on food self-sufficiency at

the national level, principally through domestic production. Food insecurity is no longer considered as a problem of the physical inadequacy of food supplies. The inability of poor countries, poor families, and poor individuals to acquire sufficient quantities of food from existing supplies either due to low purchasing power or defects in the food distribution systems limits a person's or household's entitlements to food supplies, especially among the poorest of the poor.

Food security can be viewed at four levels: the global, national, household, and individual levels. Figure 1 gives a widely agreed upon conceptual framework for food security. It shows how national food availability works through food security to ultimately influence nutritional security, which is adequate nutritional status on a sustainable basis. As is well known, enough food available at a national level is only a necessary condition for households to have access to food but it is not a sufficient condition. Households must also have the necessary resources to acquire that food and at the same time meet other basic needs. Finally, food security works through people's dietary intakes to influence their nutritional security. But food security is not sufficient for them to achieve nutritional security. They also need adequate care and a healthy living environment to be able to absorb the nutrients in food and thus use it in their everyday lives.

Figure 1. Framework for Understanding Food Security



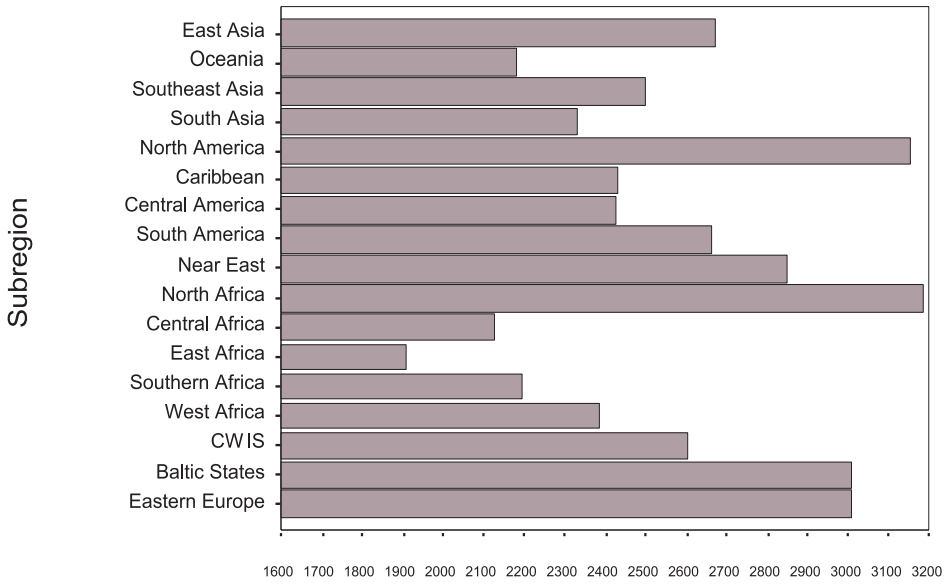
Sources: Adopted from FAO and World Bank food security related publications.

Prevalence and Depth of Food Security: The Global Context

The most commonly accepted food security indicators are all related to consumption, nutrition, and health status. Average per person dietary energy supply (DES) and percentage of population undernourished are usually used as indicators of consumption status, while consumption of cereals, roots, and tubers as percentage of DES is used as an indicator of the degree of dietary dependence on the major staple and hence the average quality of the diet for a national population. The percentage of population undernourished provides information on the number of people within a population whose dietary energy intake lies below their minimum requirements. Information on these indicators was solicited for 126 developing countries plus countries in transition from the FAO web site. For convenience, these countries were grouped into 5 regions and 17 subregions mainly based on geographic proximity.

The per capita food availability of the subregions is depicted in Figure 2. The lowest per capita food availability is observed in Africa, especially in the East, Central, and Southern African countries. In the continent of Asia, South Asian countries have the lowest per capita food availability.

Figure 2. Comparison of Per Capita Energy Supply by Subregion



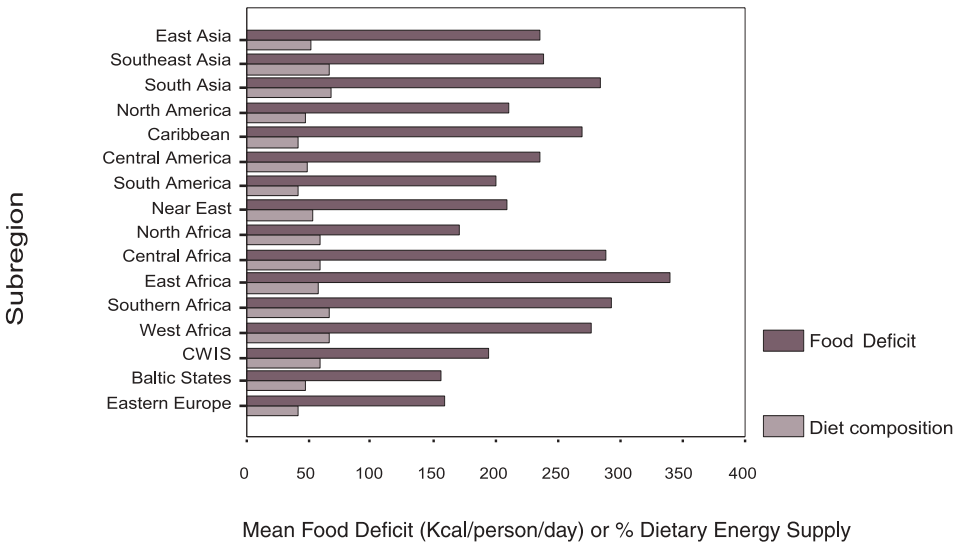
Similar patterns are observed regarding mean food deficit of the undernourished and the nutritional quality as indicated by the proportion of food staples in the total DES (Figure 3).

Generally speaking, the prevalence of food insecurity is most acute in countries or regions where the percentage of irrigated land is least. For instance, in Africa irrigated land represents, on average, less than 8% of the arable land, with large differences between countries. Irrigated land percentages are highest in the Northern region (99% in Egypt) and lowest in the Central region (0.2% in Democratic Republic of the Congo). The average for Sub-Saharan Africa is less

than 4%. Yields of irrigated land are about 2.2 times higher than from rainfed land (FAO 1996).

The African continent has a centuries-long history of rainfall fluctuations with droughts of varying lengths and intensities, which continues to the present. The Sahel, the Horn of Africa, and the countries around the Kalahari Desert are characterized by high inter-annual and intra-seasonal rainfall variability. Good and bad years do not occur singly or at random but tend to be grouped. This has important implications for food security as food and water may need to be stored over a period of several poor years.

Figure 3. Comparison of Mean Food Deficit of the Undernourished and Dietary Quality by Subregion



Food insecurity is a complex phenomenon, attributable to a range of factors that vary in importance across regions, countries, and social groups, as well as over time. These factors include the socioeconomic and political environment such as globalization, structural adjustment programs, governance, etc., the performance of the food economy, health and nutrition, armed conflict and civil strife and access to land and productive resources, and natural calamities such as drought and flood damages. Additional issues may arise due to disparities in intra-household allocation of food and gender discrimination (see Pitt, Rosenzweig, and Hassan 1990, for Bangladesh).

Many developing countries have been facing unusually adverse climatic conditions, together with the negative economic impact of the financial crisis that erupted in 1997, declining prices of several of their major commodity exports, and in a number of cases, political instability and conflicts. Food supply disruptions, associated with these problems, have led to the outbreak or persistence of serious food emergency situations in a large number of countries. On the other hand, the chronic inability of smallholder farmers to have their economic interests articulated in the political process is cause for serious concern particularly in dual agrarian societies. The lack of political wisdom to give priority to

agriculture, particularly in terms of commitment to the transformation of smallholder agriculture, is the most serious post-independence error of judgment by African nations.

Key Approaches to Addressing the Problem

In most low-income developing countries, particularly in South Asia and Africa, non-agriculture sectors, specifically services and industrial sectors, are expanding gradually at a slow pace and agriculture is still considered as engine of growth. At the present level of overall socioeconomic development, agriculture development is seen as the most effective way to achieve improved incomes and to ensure food security not only at the national level, but more importantly, for regional, local, and household level, food security, and poverty reduction. The poor with tiny landholdings and the landless will continue to depend on agriculture for food, employment, and incomes required for nonfood and basic needs. Therefore, improving agriculture and enhancing food production will remain a key strategy for food security and poverty reduction in most of the low-income countries. Improved access to food of the poor through their own increased production or through their enhanced purchasing power and economic ability to buy food would be the most effective way to move people out of food poverty.

The approaches and actions to tackle the problem of food insecurity may be categorized into four major groups. These are *the growth-oriented approaches, the equity oriented approaches, the institutional approaches, and the synergy of the three*. From the viewpoint of growth-oriented programs, the development of the agriculture sector is inevitable, since the highest incidence and severity of poverty are found in rural areas, and most of the poor are mainly engaged in the agriculture sector. Agricultural development does not only play an important role for the overall economic growth, but also its indirect effects on employment and benefits to the poor are acknowledged.

The World Bank studies in India show that primary sector growth reduces both urban and rural poverty, whereas tertiary sector growth reduces mainly urban poverty. Further, the benefits of farm sector growth are not confined to those households located near the poverty line but go down to those located deeper below the poverty line, that is, growth benefits the chronically poor. Growth has benefited Indian poor in both relative and absolute terms (Datt and Ravallion 1996; 2002). An empirical analysis of 92 countries spanning 4 decades confirms that growth benefits the poorest of the poor (Dollar and Kraay 2002). Irz et al. (2001) found that for a sample of 40 countries, the elasticity of poverty rate to agricultural productivity growth rate is about 1%, meaning that the percentage of those living below the $1 a day poverty line fell by about 1% for every percentage point increase in agricultural productivity. Taking the case of South Africa, Khan (1999) shows that the poverty reduction effects of agricultural growth multipliers are 0.146 for incidence, 0.163 for depth, and 0.196 for severity of poverty.

From the equity perspective, it is noted that growth per se is not sufficient to reduce poverty, unless its benefits are widely distributed through public provision and strengthening of social services such as education, health, nutrition, and family planning. Such programs also offer the possibility of multiple benefits. Lower productivity may be the result of undernutrition. A number of studies have shown

that health and food consumption/security directly affect productivity and wage rates in low-income settings (Strauss 1986; Deolalikar 1988; Behrman and Deolalikar 1989). In Sierra Leone, for instance, a 10% increase in per capita calorie availability increased farm output by 3.4%. This effect was stronger for households with an average per capita energy intake of 1,500 calories per day (Strauss 1986). Lipton and Maxwell (1992: 12–13) warned that there are many people who are unable to escape poverty because their supply of labor is limited (in quantity and quality) by their health, nutrition, or education. For these people, social services can also supply safety nets in the form of income transfers, consumption subsidies, and public works or emergency relief. Such social security can indirectly help growth by enabling poor people to take risks. In the Asian context, Haan and Lipton (1998) warn that poor countries will not maintain earlier rates of poverty reduction without explicit redistribution. In a similar vein, Srinivasan (2000) advocates a development strategy that generates "rapid and widely shared growth," and emphasizes investments in education and health, to help ensure that human and physical capitals are efficiently utilized for poverty reduction.

It is clear that there are two important fronts for public intervention that can be identified. One involves fostering the conditions for pro-poor growth, particularly in providing broad access to the necessary physical and human assets, including the infrastructure. The other entails helping those who cannot participate fully in sharing the benefits of such growth, or those who do so with continued exposure to unacceptable risks. Providing a basic infrastructure, services, and maintenance of basic amenities to several rural areas are a universal function of the state. Often these are outside the power of local communities to command and install, or of the market to provide them.

From the institutional point of view, *institutional change* is a precondition for the eradication of rural poverty and food insecurity. The experience of the past decade of development shows that unfavorable institutional environments restrain the ability of the poor to participate and share in the benefits from the fruits of development.

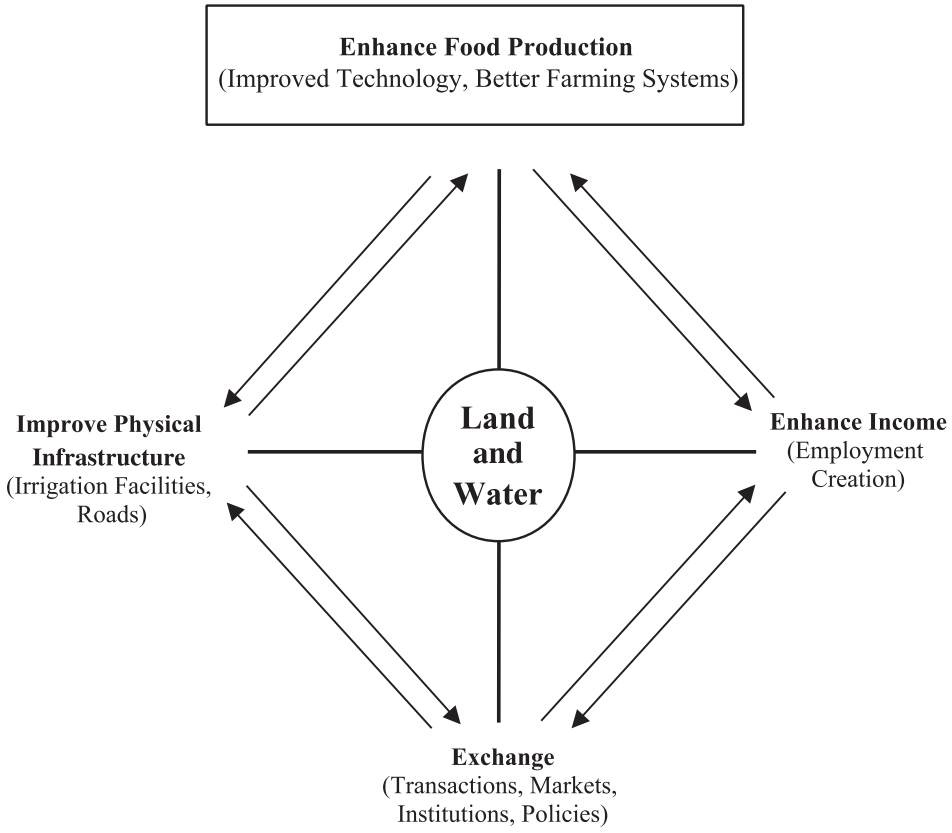
Still there are some who argue that the synergy of the above three elements is of paramount importance in achieving development goals and alleviating food insecurity. Programs and interventions in rural development should not only take place in the field of production or growth, but also be extended to the field of consumption or equity, as well as in the inclusion of institutional or organizational programs.

In order to achieve success, strategies to eliminate food insecurity have to tackle these underlying causes by combining the efforts of those who work in diverse sectors such as agriculture, nutrition, health, education, social welfare, economics, public works, and the environment. At the national level, this means that different ministries or line departments need to combine their complementary skills and efforts in order to design and implement integrated cross-sectoral initiatives which must interact and be coordinated at the policy level. At the international level, a range of specialized agencies, development organizations, and funding agencies must work together as partners in a common effort.

The causes of food insecurity suggest that four major interventions can be used to improve food security. These are illustrated in Figure 4. The first influences

food security by enhanced agricultural production. The small farm sector must be the center of this effort. A number of studies demonstrate that smallholdings generally achieve better energy ratios than larger ones (e.g., the ratio of energy available in the crop produced, to the energy required to produce it). Smallholder family farms also offer greater impact on alleviating poverty, hunger, and unemployment. In addition, smallholder farmers who use irrigation generally achieve much higher incomes than their rainfed counterparts.

Figure 4. Interventions for Improving Food Security

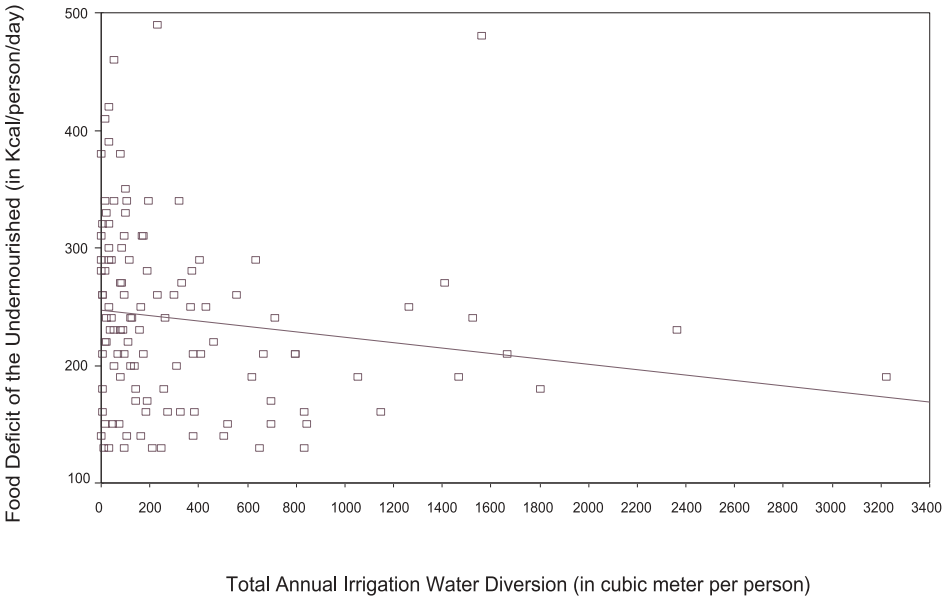


The second intervention is aimed at improving the purchasing power of the poor by generating more employment opportunities and empowering the poor. The third intervention is to facilitate exchange of goods and services by the poor. This involves creating an enabling environment for the poor to engage in market transactions as sellers and buyers of goods and services through effective policies and institutions. The fourth intervention involves infrastructure development such as the provision of irrigation facilities, development of the rural roads to access markets, and provision of electricity.

Agricultural water resources development has been a key component of each of the four areas of interventions. A scatter diagram of the relationship between irrigation water development and food security is depicted in Figure 5 and Figure 6. Figure 5 shows the relationship between annual irrigation water diversion in cubic meter per person and food deficit of the undernourished for 126 developing

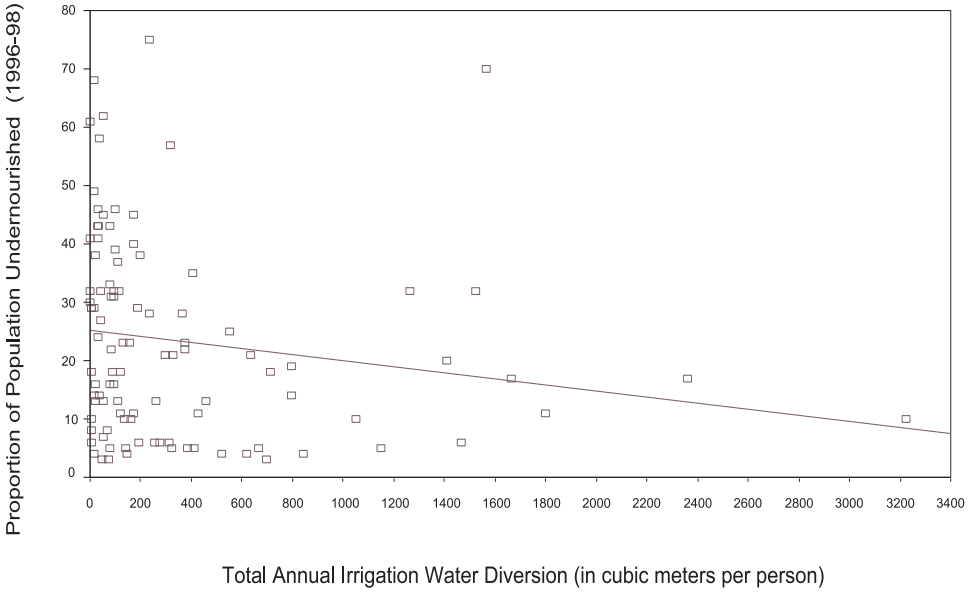
countries and countries in transition. One can vividly see that as per capita annual irrigation water increases, the level of the food deficit of the undernourished decreases substantially. However, one can also see that certain countries achieve the lowest deficit irrespective of the level of irrigation water diversion. This shows the differential economic development among developing countries and variations in their structure of economy. Figure 6 also depicts a similar trend, i.e., as the annual total irrigation water diversion per person increases the proportion of population undernourished decreases. A recent World Bank study in Viet Nam on irrigation investment showed that even undifferentiated expansion of irrigation schemes (without targeting the food insecure and vulnerable group) would be redistributive—having higher proportionate gain to the poorer households. However, the study also concluded that targeting irrigation expansion to the households with smallest per capita land produces the most progressive incidence of gains as well as the largest absolute benefit to the poor, given the right level of education (van de Walle et al. 1995). Jimenez (1995) summarizes 58 studies from various countries and shows that 1% improvement in irrigation, rural roads, or the density of regional roads creates 1.62%, 0.26%, and 0.21% improvement in agricultural productivity.

Figure 5. Relationship between Irrigation Development and Food Deficit of the Undernourished



The substantial investments in irrigation development facilitated the green revolution and the gains in cereal grain production. The increased production and the lower cereal prices obviously benefited the poor. Irrigation development also enhanced farm incomes and increased employment opportunities, both on— and off-farm, providing entitlement or purchasing power for the poor. For landless laborers, the increased cropping intensity in the irrigated farming areas provided the greatest opportunities for employment. Storage dam construction and other innovations in hydrology such as more effective and cost-effective ways of harnessing or accessing and using water, especially groundwater, have enabled

Figure 6. Relationship Between Irrigation Water Development and Food Security



dry season cropping of land which were usually left fallow, thereby increasing household food supply. In the following sections, these views are further tested by drawing on the experience of irrigation investments in Sri Lanka, Pakistan, and India.

In Sri Lanka, irrigation development has been a major instrument used by the government in its attempts to enhance food security and eradicate poverty for over 5 decades. Substantial investments have been made to establish irrigated land settlement schemes in the dry zone of the country and to resettle poor landless families from the overcrowded wet zone and provide them with an opportunity to enhance their livelihoods through irrigated farming. By 1998, some 328,000 ha of land had been developed under irrigated settlements and about 200,000 poor families had been resettled.

The irrigated land settlement policy of the government has been a multi-pronged strategy. Irrigation development was coupled with the development of other physical and social infrastructure. Many of the settlement schemes are now prosperous agricultural areas and form the cornerstones of agricultural production in Sri Lanka. The irrigated settlements of Sri Lanka can be regarded as a good example of water resources development against poverty.

Under Sri Lanka's resettlement policy, the focus has been on directly targeting the poor. One such scheme, an example of a large irrigation system that was developed targeting the poor, is located in the Walawe Ganga Basin in southern Sri Lanka. Presently, about 17,400 ha of irrigated land provide direct and indirect support to 34,000 families settled in the scheme (including families encroaching lands in the area). A large number of these families have been relocated from other districts for settlement in the basin. Each settler is given a parcel of 1–2 ha for paddy and other field crop cultivation, in addition to land allotment for homesteads. Land and water resources development in the area is truly a pro-poor intervention.

A recent study by the International Water Management Institute (IWMI) assesses the poverty reduction impacts of the development of irrigation infrastructure and access to irrigation water in the scheme. The study is based on comparisons of irrigated areas with rainfed areas, under similar agro-climatic conditions, with in-depth analysis of incidence, depth and severity of poverty using both monetary and nonmonetary indicators of poverty. The study uses field level panel data recently collected through comprehensive field surveys, and participatory poverty assessments. The study provides strong empirical evidence that irrigation does have a positive impact on food security and poverty reduction. Areas without access to irrigation infrastructure and inadequate water supplies have the highest incidence, depth and severity of income/monetary poverty. Areas with access to irrigation infrastructure generally have lower levels of chronic poverty and a higher proportion of non-poor. Average annual household food expenditures in areas with and without access to irrigation are found to be $448 and $343, respectively.

The analysis of nonmonetary indicators of poverty such as dependency ratio, mortality rate of children below 5 years, housing, education, and other facilities, clearly demonstrates that households with access to irrigation are socioeconomically better-off than those without access to irrigation. The availability of water is critical to obtaining regular incomes and even in irrigated areas with access to irrigation infrastructure, the lack of water could result in lower incomes. Factors such as adequate water, marketing facilities, and diversified cropping can help to reinforce and boost the benefits from irrigation infrastructure.

The study also compares the impacts of irrigation on poverty in Sri Lanka with those in Upper Indus Basin Pakistan. In Pakistan, land distribution is highly skewed leading to significant inequity in distribution of benefits of water resources, and most of the water resources were developed for general socioeconomic uplift rather than specifically targeted to the poor. Consequently, the impacts of most agricultural water-related recent interventions (such as of on-farm water management programs) on food security and poverty of the real poor has been only marginal.

Many irrigated areas in large-scale systems, particularly in India and Pakistan, continue to remain home to a large number of the poor. This is partly due to low productivity resulting from lack of access to water, even within the established systems, particularly in downstream areas. Table 2 presents results from a recent detailed study on wheat productivity in selected systems in India and Pakistan. In India, wheat yields consistently decrease toward tail ends as access to water decreases. A similar pattern is observed in the studied systems in Pakistan, except in areas where groundwater quality is good (such as the Khadir system).

Lower productivity at tail ends translates into lower farm incomes, resulting in higher incidence of poverty. The study concludes that wheat production is highly profitable with only canal water use, and least profitable with the sole use of poor quality groundwater. The study presents alternative scenarios on impacts of water use from two sources on the socioeconomics of wheat production, and it is suggested that adopting effective reallocation of canal water at the distributary level can increase overall gains from wheat production. Much of the gains from canal water reallocation will be achieved in reaches where groundwater is of poorer quality (mainly tail ends of irrigation systems). The study concludes

Table 1. Average Wheat Yield (t/ha) of Different Watercourses in India and Pakistan, 2000–2001

India						
Location (Distributary/ Watercourse)	Batta			Rohera		
	Head	Middle	Tail	Head	Middle	Tail
Head	4.81	4.73	4.42	4.92	4.83	4.28
Middle	4.56	4.42	4.22	4.89	4.79	3.98
Tail	4.35	4.31	3.72	4.91	4.67	3.55
Average	4.57	4.49	4.12	4.91	4.76	4.04
Pakistan						
	Lalian			Khadir		
Head	5.18	4.02	2.96	4.56	3.00	4.51
Middle	4.92	3.31	3.01	3.32	3.51	4.57
Tail	4.79	4.5	3.59	4.22	3.62	4.69
Average	4.95	3.92	3.19	4.03	3.37	4.59

Based on crop cutting experiment, 2000–2001.
Source: Intizar Hussain, R. Sakthivadivel; Upali Amarasinghe, M. Mudasser, and David Molden. 2003. *Land and Water Productivity of Wheat in the Western Indo-Gangetic Plains of India and Pakistan: A Comparative Analysis*, IWMI Research Report 65. Colombo: IWMI.

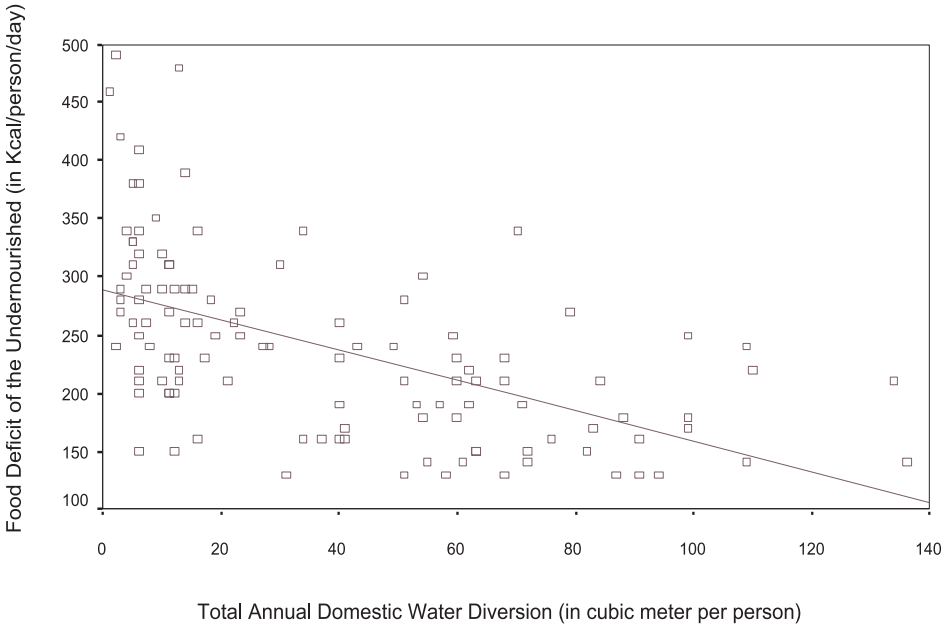
that the proposed canal water reallocation under conditions of water scarcity would lead to an increase in economic productivity, environmental sustainability, (by reducing further degradation of land and water resources), and social equity with significant impacts on poverty at tail ends.

On small-scale irrigation, recent research work by IWMI suggests that small-scale technologies have tremendous potential for improving the livelihoods of the poor in eastern India, the Nepal Terai and Bangladesh (the heartland of the Ganga-Brahmaputra-Meghna basin), South Asia's so-called *poverty square*. Underlying this region, where 500 million of the world's poorest people, with tiny landholdings, is one of the world's finest groundwater resources, available at a depth of 1.5–3.5 meters. Here they employ an example of such technologies—the treadle pump, which is truly a pro-poor device. It is cheap, with a cost of about $12–30, easy to install, operate, and maintain, and has no fuel costs. It has higher output than a hand pump and other manual devices. Treadle pump use results in increased land use intensity, and average yield tends to be much higher than yields obtained by farmers using diesel pumps or other manual devices. The income impact of the treadle pump varies across households and regions, with an average increase of

$100 per year in net annual income. The study indicates that the "treadle pump technology has the potential to increase the net annual income of South Asia's poorest rural households by one billion dollars" (Shah et al. 2000).

In addition to its direct production and productivity effects, water resources development efforts, particularly the provision of adequate domestic water, will also have indirect productivity and production effects, and hence food security impacts through its effects on health and sanitation. This fact can be observed from Figure 7. Countries with higher total annual water diversion for domestic use per person had lower levels of the food deficit of the undernourished.

Figure 7. Relationship between Domestic Water Supply and Depth of Undernourishment



Policies and Actions

There seems to be a general consensus that the issue of food security is complex due to the interconnections among several factors. The most immediate ones are: lack of access to means of production (e.g., land and water) or insufficient purchasing power by households, unavailability of food, inappropriate distribution, and inadequate use of food at the household level. These causes are deep-rooted into a set of other causes including: socioeconomic and political environment (national policies and institutions) access to productive resources, natural calamities such as floods and droughts, and health and nutrition. Food security is not only an issue of security of having access to enough grains; it is also about balanced diets, nutrition, and health.

Mere availability of enough food at the global or national level will not guarantee that communities and households or individuals will be food secure. The problem needs to be addressed at various levels, national to individual level, considering various population groups (children, elderly, female, etc.).

Improved access to water by the poor, through effective management, helps enhance food security and livelihoods of the poor through enhanced production, consumption of both food and nonfood items, incomes, employment, and other indirect impacts. Lack of access, resulting mainly from ill-management, does the opposite and helps perpetuate poverty. Interventions are required to resolve problems of: "physical" water scarcity, "economic" water scarcity, and "institutional" water scarcity (e.g., poor management as well as inefficient, inequitable, and unsustainable use of water). Under the first situation, non-water related interventions will be needed to improve food security and livelihoods of the poor; the second situation calls for more pro-poor investments in the water sector; and the third situation calls for effective management of water through improved institutional arrangements.

In addition to broad interventions, finally, and most importantly, everybody should have the right to water and food, basic human needs. For improving the access of the poor to water to enhance food security, targeted interventions to increase benefits to the poor are urgently needed. These interventions are needed at all levels: the national, regional, community, and household levels. The following are some identified policies and actions that are needed to improve food security through improving water security of the poor:

- Increasing welfare/well-being per drop of water. Moving from more crop per drop or more jobs per drop to more welfare/well-being per drop of water
- Promoting equitable access to land, water, and food
- Promoting the IWRM or the river basin management approach. Sectoral approaches no longer generate desired outcomes
- Prioritize allocation of water to various sectors (domestic, agriculture, industry, and environment for sustainability)
- Using local wisdom/knowledge. Promoting technologies that are appropriate and indigenous
- Developing and improving legal and institutional frameworks or policies for ensuring the security of food and water for the poor
- Incorporating gender issues into policies and undertaking gender awareness training
- Enhancing the role of the private sector and markets in enhancing production and its equitable distribution
- Promoting support measures (e.g., education, awareness, capacity building, and the inclusion of women)
- Prioritizing geographic areas of focus (e.g., the poor or least developed areas)
- Promoting research on understanding linkages between water and poverty to identify pro-poor interventions
- Undertaking gender mapping in poverty studies and establishing gender audits
- Developing partnerships to undertake these actions

Conclusion

Based on the analysis and evidence, the study concludes that access to irrigation has significant impacts on food security and poverty reduction. Irrigation infrastructure can help ensure food security and lift both farm and nonfarm households out of permanent or chronic poverty by increasing productivity, employment, incomes, as well as expenditures, and indirectly, by enhancing related economic activities. Along with infrastructure development, availability of water is critical to the achievement of the stated benefits. Inadequate water supplies will reduce the impact of infrastructure on poverty, even if the infrastructure is well developed. Poor maintenance can lead to reduced water supplies and negate any positive impact on poverty reduction. Similarly, even if water supply is adequate and the infrastructure well maintained, the cultivation of low value crops or the absence of marketing facilities can reduce the impact of infrastructure on poverty.

Issues of smallholder agricultural development in general, and food security in particular, can no longer be divorced from issues of democracy, transparency, social justice, politics, and governance. Food insecurity is directly related to the secondary role accorded to agriculture in general and smallholder agriculture in particular. This secondary role is mainly so in terms of public sector support and investment in rural areas. The transformation of smallholder agriculture to a more science-based production system requires committed governance as well as a system of public and private sector organizations with the capacity and commitment to support and transform small-scale agriculture in terms of productivity and participation in the national economy. For food-insecure low-income populations, higher yields (per hectare and per drop of water) for food staples and therefore extra employment and self-employment income in growing them, will be the main source of enhanced food security. However, reducing poverty and food insecurity is not simply a question of enhancing agricultural productivity and production or of generating more income; it is fundamental to address institutional, political, and economic factors that tend to exclude individuals and population groups from progress. Unless policies, institutional arrangements, and public expenditure patterns which are counterproductive to integrated water resources management are realigned and improved, water that could be used successfully for improving agricultural productivity in irrigated and dryland agriculture alike, will be wasted and per capita food availability will continue to fall.

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The Role of Water in the Development of Sustainable Livelihoods of the Poor

John Soussan and Dirk Frans

Introduction

This paper was written as one of a series of papers that elaborate on key elements of the thematic framework developed for the Water and Poverty Initiative (WPI),[1] in which six key action areas to improve water security for the poor were identified:

- Pro-poor water governance
- Improved access to quality water services
- Pro-poor economic growth and livelihood improvement
- Community capacity building and empowerment
- Disaster prevention and mitigation
- Management of the environment

The concept of sustainable livelihoods is seen as critical to understanding the relationship between poverty and water security. Poverty is complex and multifaceted and reflects both the material and the nonmaterial conditions of people's lives. Any effective strategy to target the needs and potentials of the poor needs to reflect the multidimensional character of poverty. Water security means that people and communities have reliable and adequate access to water to meet their different needs, are able to take advantage of the different opportunities that water resources present, are protected from water-related hazards, and have fair recourse where conflicts over water arise. The intention of this paper is to provide a more complete understanding of this concept than is possible within the overall thematic framework of the WPI. It draws heavily on ideas and examples developed by the UK Department for International Development (DFID), and in particular on a DFID-funded research project[2] in which the authors are involved.

[1] The Water and Poverty Initiative is a partnership of many leading international organizations, coordinated by the Asian Development Bank, that is intended to create a greater awareness of advocacy for and develop strategies to achieve the potential of water as a key element in poverty reduction.

[2] Understanding Policy-Livelihood Relationship in South Asia, a project funded under the DFID Policy Research Programme led by the Stockholm Environment Institute at the University of York, UK.

Understanding Sustainable Livelihoods

The concept of sustainable livelihoods has been gradually developing over the last decade to a position where it is widely accepted as offering new insights into the dynamics of development and the diversity of experiences of the poor (and other) people throughout the world. It is an approach that is flexible and dynamic, and in particular that provides a basis for understanding the relationship between poor communities, their local environment and external socioeconomic, environmental, and institutional forces. Carney (1998) presented a definition of livelihoods that is widely accepted.

> A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resources base (Carney 1998, page 4).

Rennie and Singh (1996) argue that "predominantly the poor of the world depend directly on natural resources, through cultivation, herding, collecting or hunting for their livelihoods. Therefore, for the livelihoods to be sustainable, the natural resources must be sustained" (page 9). This is certainly true where, as is the case for many rural communities, access to natural resources such as water (and others) is vital to many activities that are key parts of the livelihoods of the poor. A few points can illustrate how this approach helps in the development of activities that focus on the relationships between water, poverty, and sustainable livelihoods.

- The concept of livelihoods is *dynamic,* recognizing that the conditions and composition of people's livelihoods changes, sometimes rapidly, over time.
- Livelihoods are *complex*, with households in the developing world undertaking a wide range of activities: people are not just farmers, or laborers, or factory workers, or fisherfolk: "rural families increasingly come to resemble miniature highly diversified conglomerates" (Cain and McNicoll, 1988, quoted in Ellis 1998).
- Livelihoods are influenced by a wide range of external forces: social, economic, political, legal, environmental, and institutional, both within and outside the locality in which a household lives, that are beyond the control of the family.
- People making conscious *choices* through deliberate strategies on the way that they can best deploy whatever assets they possess to maximize the opportunities and minimize the risks they face. In livelihoods analysis, the poor are seen as active strategists rather than passive victims or recipients, and the household is the main unit in which these choices are made.

The relationship between the different elements of livelihoods dynamics identified here are shown in Figure 1, with the main features of this model as below.

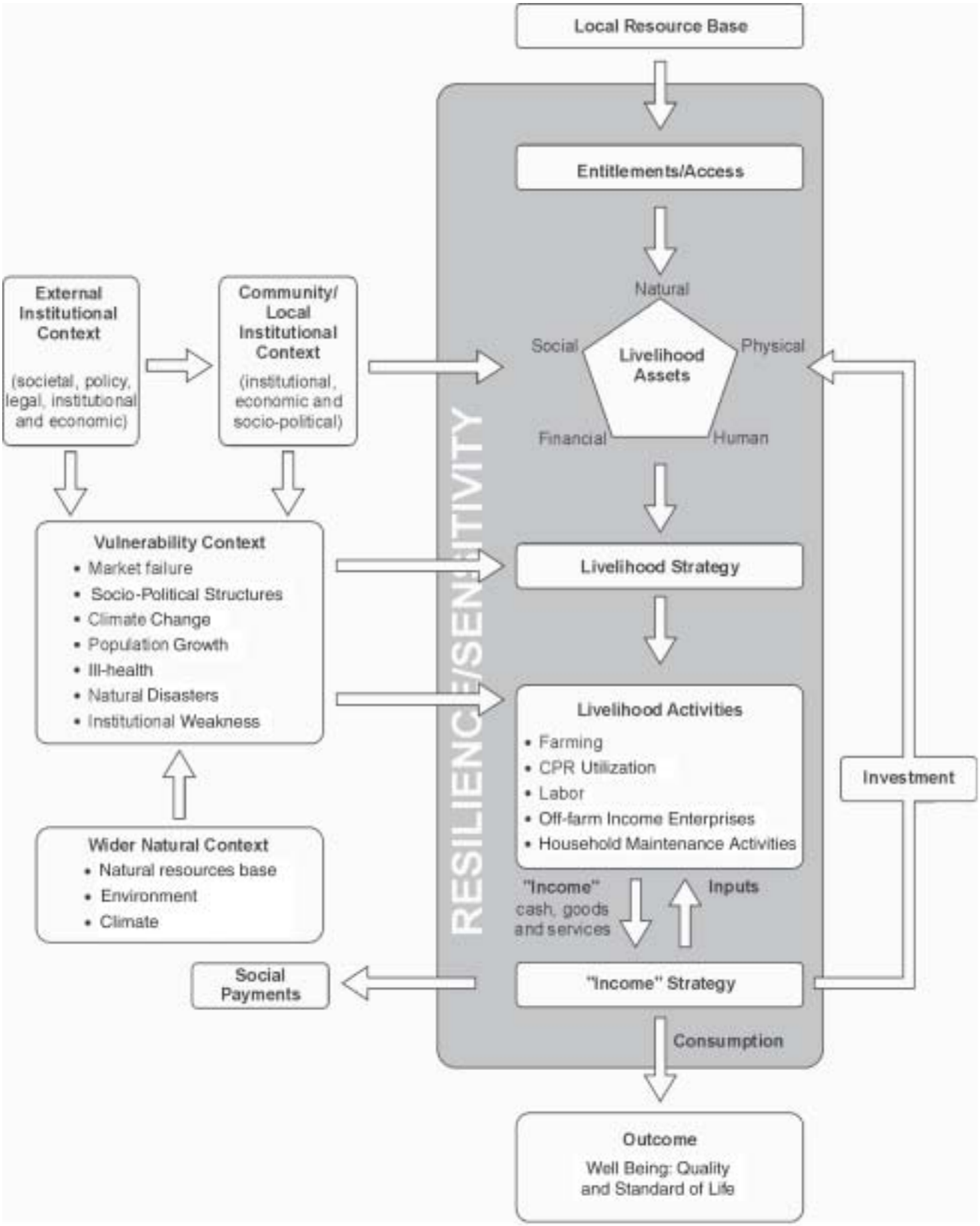
- People draw on a set of *capital assets* as a basis for their livelihoods. Carney (1998) identifies five: human, natural, financial, physical, and social. Livelihoods are built from a series of choices over the use of these assets. For common property resources such as water in particular, a key issue is the systems of entitlements through which people, especially the poor, gain access to these assets: that is, the legal, social, and other factors that dictate who is able to draw upon the resources and who is not.

- Based on the choices made, members of the household will undertake a series of *livelihood activities:* growing a crop, fishing in a lake, working for someone else, or making pots. Some activities may be dominant but it is rare for a household, and especially for poor rural households, to rely exclusively on one, and most combine complex sets of activities in their livelihoods. It should be noted that a livelihood approach also includes activities such as collecting fuel wood or water that are usually called "reproductive" activities. These are typically an important part of the daily routine for women in particular and are of key importance in both livelihoods and ecosystems management terms.
- These activities will generate *income* for the household: goods, services, and cash, which is then allocated in four main directions: recirculated as *inputs* into livelihood activities; *social payment*: taxes, interest on loans, etc.; *invested* to maintain or enhance the livelihood assets base; or *consumed:* food, housing, clothes, and all the other goods and services that contribute to the material quality of life of the household.
- Many *local and external factors* influence livelihoods, including markets, the physical environment and the social and political environment. These features are themselves inherently dynamic and livelihoods are *vulnerable* to the shocks and trends in these factors that are beyond their immediate control. The impact of these external shocks and trends will vary from household to household. Some are more sensitive to their influence, while others are better able to absorb their impact or respond to the opportunities they may offer. The character of these external forces represents the *vulnerability context* within which the livelihood systems of different households develop, while the ability of households to cope is their *resilience* in the light of these vulnerabilities.

For poor people, *vulnerability* is both a condition and a determinant of poverty, and refers to the ability of people to avoid, withstand, or recover from the harmful impacts of factors that disrupt their lives and that are beyond their immediate control. This includes both shocks (sudden changes such as natural disasters, war, or collapsing market prices) and trends (environmental degradation, oppressive political systems, or deteriorating terms of trade). These vulnerabilities affect different households very differently. In general, the more affluent a household is, and in particular the more assets it possesses, the more *resilient* it is to disruption in its livelihoods base from these shocks and trends.

People, of course, are not passive in the face of these risks, but the poorer the asset base of a household the more they may have to forego potentially profitable but risky opportunities. The poor are typically "risk minimizers" rather than "profit maximizers." This is not because they do not understand the difference: it is an inevitable response to unenviable threat. Rennie and Singh (1995) categorize the responses of such threats as either *adaptive strategies* (where a household consciously adopts a process of change in response to long-term trends) or *coping strategies* (short-term responses to immediate shocks and stresses). In these, the household will seek to deploy their different assets to best effect within the limited range of choices open to them. This set of choices reflects the extent to which poor people can control the key decisions that affect their lives. This is (or should be) why *participation* is widely advocated: it is about giving the most

A Model of Livelihoods Dynamics



vulnerable *greater choices* to reduce the risks they face and increase their ability to best use the assets they possess.

Water in the Livelihoods of the Poor

Ensuring that poor communities have access to water resources has become widely equated with ensuring that the basic needs of the poor are met, which in turn is interpreted as ensuring safe and affordable drinking water and sanitation: indeed, this approach is enshrined in the Millennium Development Goals. This issue is undoubtedly of great importance, and where the poor do not have access to safe or affordable water supplies, then this is always going to be an extremely high priority for any investments (and not just water management). This perspective is too limited if a livelihoods approach is adopted, however, as access to water is a key element of many different aspects of the livelihoods of poor communities. Indeed, poor people depend upon water in four key ways: as an input into production, for the maintenance of health and welfare, to ensure ecosystems integrity, and to reduce vulnerability to hazards.

Water as an Input into Production

Water resources are vital inputs into livelihood production activities in a wide variety of ways. Agriculture is the most obvious, as in many rural communities agricultural production is the basis of the economy and the viability of agriculture is closely linked to reliable access to water. This is true for both irrigated areas, where some degree of control exists over the availability of water, and rainfed areas where production is far more directly subject to the vagaries of climate. Many poor people in regions such as South Asia are not directly farmers themselves, but are rather agricultural laborers and as such are as dependent (indeed at times more dependent) upon the viability of agriculture as the farmers who employ them. Improvements to existing irrigation systems, and where viable, the extension of irrigation coverage have great potential for improving the livelihoods of the poor so long as there are steps to ensure the access of the poor to the land and water. This is a key issue for irrigation: to improve the access of the poor to the benefits along with improving the hydrological effectiveness of the irrigation systems.

It is, however, rainfed agriculture that presents the most formidable challenges in improving the potential of water in the livelihoods of the poor. This is for two reasons: more poor people's livelihoods are dependent upon rainfed agriculture and the productivity of this agriculture is far more fragile in the face of variable rainfall. Rainfed agriculture is often found on the most marginal lands (with poor soils, often steep slopes, and limited scope for improvement) in remote, semiarid areas. Actions such as rainwater harvesting, improved access to groundwater, and improvements to on-farm water management, can bring dramatic and sustainable benefits that can transform the livelihood prospects of poor people. These approaches link water management to the management of land and other aspects of natural resources management. They include actions on the farm, such as better soil moisture management or the selection of crop types, but on their own these are often not enough. Actions such as watershed protection and forest protection that are at the community level and consequently require a significant level of community organization must be linked to these.

There are many other productive activities that depend on water as a key input, including fishing, tree and garden cultivation around homesteads, livestock, small-scale manufacturing such as pottery, brick making, and tanning, services such as laundering and others. Water is also vital for many types of manufacturing and other larger economic activities that provide employment for poor people particularly in cities. These many activities can be the main source of livelihoods for poor households, with this particularly the case in coastal areas, wetlands and around lakes, arid areas, (where livestock dominate), and mountainous areas. Even where they are not the main livelihood activity, the poor often rely on these other production activities to give essential diversity to their livelihoods and to overcome their lack of assets such as land. The ability to grow some fruit and vegetables, keep a few animals or make some small goods may not be visible in most economic statistics, but is a vital part of the livelihoods of the poor. They can be especially important for the very poor who have the most limited asset base: women-headed households or socially marginal groups. Actions to sustain and expand these activities will often cost very little and can have significant and immediate livelihoods benefits for the poor. They are often "self-selecting" for the poor, as it is the poor who are the most likely to undertake these activities. Recognizing these potentials requires a different look at the provision of water supplies to households and local communities, acknowledging its significance for production as well as consumption purposes by the poor.

Water for Health and Hygiene

The *health and welfare* conditions of the poor, especially of vulnerable groups such as children, the elderly, and women in general, are closely connected to the provision of adequate, safe, and affordable water supplies. The lack of these supplies is one of the main reasons for ill health and premature death among the world's poorest communities. The figures involved are staggering. Worldwide, there are an estimated 4 billion cases of diarrhea each year, causing 2.2 million deaths, mostly among children under the age of 5: this is equivalent to one child dying every 15 seconds. These deaths represent approximately 15% of all child deaths under the age of 5 in developing countries. Similarly, intestinal woes affect about 10% of the population of the developing world, with major nutrition and other consequences. Again, children are the most vulnerable. Around 200 million people suffer from schistosomiasis; millions have been blinded by trachoma, malaria, cholera, and other diseases and where poor water management is a major causal factor, blight millions more; and toxins in groundwater such as arsenic and fluoride are an emerging threat in regions such as South Asia.

These disease burdens have obvious direct impacts in increased morbidity and mortality. They also have further major consequences for poor people through their effects on nutrition, physical and mental development, the costs of health care, and the loss of productive potentials as key household members are ill or die. Reducing the health and welfare impacts of poor water supply and sanitation has rightly been identified as one of the key challenges for the 21st century and should be a priority for nations and the international community. Both the quality and quantity of water matters greatly in this, and safe and adequate quantities of water are recognized as a precondition for an acceptable standard of development. The UN Millennium Declaration defines a target of halving the

proportion of people living in extreme poverty and to halve the proportion of people who suffer from hunger and are unable to reach or to afford safe drinking water by 2015. A similar target has been proposed for sanitation. Actions to achieve these goals should be integrated into all national and international development processes and are one of the key areas where improvements to water management will have direct benefits for the livelihoods of the poor.

Ecosystems in the Livelihoods of the Poor

The flow and quality of water is critical for the viability of the *ecosystems* through which the poor gain access to the natural resources that are the basis of many aspects of their livelihoods. Even where water is not a direct input into production, other natural resources (such as forests, fish, or grazing lands) that are contingent on the viability of ecosystem processes depend on the flows of water through these systems. The maintenance of the integrity of these ecosystems is critical for poverty reduction and the maintenance of livelihoods as much as for their ecological significance. In livelihood terms, these resources are often the most significant livelihood asset available to the poor, in terms of the natural capital they represent. This is particularly true for the very poor who lack access to other assets such as private land, physical and financial capital, and even social capital. Natural-resources dependent activities are the basis of many of their livelihoods, including activities such as grazing for pastoralists, forest products (both wood and non timber products) for forest dwellers, and fishing for the inhabitants of coastal areas, wetlands, and lake areas. These activities are particularly important for indigenous peoples, nomadic pastoralists, and other minority groups who are frequently marginalized by mainstream development processes. The continued viability of and continued access to the flows of natural capital that come from common property resources are the key to their continued survival.

Even where such resources are not the main source of livelihoods, many poor people are dependent upon flows of goods such as fodder, fuelwood, supplementary foods (which can be especially important during periods of poor food security), and other products that come from common property resources. Although rarely monetized and often ignored, these goods are significant for poor rural people throughout the developing world. Not least of the goods that healthy ecosystems provide is water itself, with the flows of adequate and good quality water for production and consumption uses being largely a reflection of the condition of the ecosystems through which it flows.

Reducing Vulnerability to Water-Related Hazards

The last decade has seen a dramatic increase in the number and intensity of water-related disasters and other forms of hazard. Between 1991 and 2000, over 665,000 people died in natural disasters, of which 90% were water-related. The vast majority of victims were from developing countries. Growing concentrations of people in vulnerable areas like coasts, floodplains, and marginal lands mean that more people are at risk. And while poor countries are more vulnerable, in every country it is the very poor, elderly, women, and children who are especially hard hit during and after disasters. Geographically, Asia fared particularly badly, with roughly 40% of all disasters taking place there. Each event frequently leaves

thousands of communities most vulnerable to the next, with both individuals and governments barely able to recover from one disaster before the next catastrophe strikes. Worldwide, floods were the most reported disaster event, with 2000 seeing 153 flood events, including disastrous floods in Mozambique and along the length of the Mekong, while in terms of loss of life, droughts claimed the greatest number of victims.

The poor, who are the most vulnerable to these water-related hazards, adjust their livelihood patterns to reflect the vulnerability that they face. This vulnerability can undermine any effort to break the poverty trap and can even cast the not so poor into poverty where the basis of their livelihoods is destroyed by a cataclysm. Low resilience to water-related vulnerabilities is a defining characteristic of poverty where these threats exist. The significance of disasters as a driver of water resources management should consequently not be underestimated. It is not just the specific impact of disasters, but the way that they interact with other aspects of water management, and the ways that vulnerable people adjust their resources management to take account of the risks they pose, that is important.

Conclusion

The four areas in which water resources influence the livelihoods of poor people identified above correspond in broad terms to major arenas of action in water management: irrigation and other types of water provision for productive activities, domestic water supply and sanitation, ecosystems management, and disaster management and mitigation. These four areas of action are typically undertaken separately by different institutions (and in the case of governments, often different ministries), but they are not separate in the lives of the poor. All are an integral part of the dynamics of their livelihoods. In all four, the links between poverty, gender, and the environment are obvious, as is the importance of the access of the poor to and the rights of the poor over water and other natural resources.

A livelihoods approach to water management will reflect this and develop an integrated approach at the local level: indeed, integrated water resources management should be built from such local level integration. This will in turn only be achievable where there exist effective local level institutions through which the different needs of different parts of the community can be balanced and any potential conflicts can be mitigated. Ensuring such institutions exist is the first and most essential part of a livelihoods approach to water resources management.

Achieving this coherent, livelihoods-based approach is contingent upon the governance conditions that regulate the access of poor people to water resources. In defining the key objectives of any strategy that seeks to improve poverty-water security, consequently, the goals need to be specified in relation to the real needs and uses of the poor for water resources and the factors that enhance or restrict their access to these resources.

Water management plays an important part in many aspects of livelihood processes, and in particular are essential to many livelihood activities: both productive such as agriculture and manufacturing and household maintenance activities. Focused efforts to meet the needs of the poor need to understand the

different roles that water security plays in their livelihoods. Water security is a necessary, but on its own insufficient precondition, for improvements in the livelihoods of the poor. What is needed is advance along a broad front of livelihood-relevant areas, along with proper coordination to ensure maximum complementarity between these different dimensions of people's lives. This varies from community to community and prescriptive assumptions need to be avoided here. What is clear is that the potential contribution to poverty reduction of improvements to water management can only be fully understood when set within a livelihoods context. The approach set out in this discussion paper provides the basis for understanding these relationships. It is an approach that should be central to the development of pro-poor integrated water resources management.

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