Integrated Water Resources Management (IWRM) in Perspective of People's Wisdom

A Review of the IWRM to link with People's Traditional Wisdom & Practice on Water Management in Bangladesh

Water for People's Network Asia
&
Coastal Development Partnership (CDP), Bangladesh

Water for People's Network Asia

Research Report

Reviewing IWRM in Perspective of People's Wisdom

(People's Traditional Practice on Water Management)

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Acronyms

ADB	Asian Development Bank
BWDB	Bangladesh Water Development Board
CEGIS	Center for Environmental and Geographic Information Services
E1A/SIA	Environmental and Social Impact Assessment
GWP	Global Water Partnership
ICWE	International Conference on Water Environment
ICFW	International Conference on Fresh Water
KJDRP	Khulna-Jessore Drainage Rehabilitation Project
NGO	Non Government Organization
O&M	Operation and Maintenance
TWWF	Third World Water Forum
TRM	Tidal River Management
UNCED	United Nations Conference on Environment and Development
WMA	Water Management Association
WMC	Water Management Committee
WMF	Water Management Federation
WMG	Water Management Group
WMO	Water Management Organization
WSSD	World Summit on Sustainable Development
WWC	World Water Conference

Meaning of some local terms

Beel : Sunken land between the high banks of two rivers, of caused by subsidence due to decomposition of underground organic matter.

Matabbar: Rural community leader.

Polder: Encircled land by embankment.

Executive Summary

Water is a basic human need and access to minimum quantities of safe water (20 liters per person per day) should be everyone's right. Lack of access to safe drinking water, sanitation, and irrigation is directly related to poverty and poor health. Water is recognized as an economic good in many international declarations, such as those reviewed above, as well as in the policies of major lenders and donors. However, there is a risk in fostering the notion of water as a commodity, because it shifts the public perception away from a sense of water as a common good, and from a shared duty and responsibility. A simple and straightforward solution, designed on the basis of pure economic efficiency, has the potential of ending up unsustainable. The application of economic principles to the allocation of water should not be acceptable; water should not be treated as a market-oriented commodity when it comes to domestic use for very basic needs, particularly for people in extreme poverty. In many developing countries, the very poor actually pay a great deal for water relative to their income, but these costs are often hidden. Water is priced by all urban societies, and the poor often have no choice but to pay high prices on potable water and sanitation. For example, in OECD countries, households spend about 1% of their income on water; on the other hand, in Onitsha, Nigeria, the poor spend as much as 18% of their income on water. More discussion, analysis, study, and commitment are needed in deciding whether water is a common or an economic good.

The Integrated Water Resources Management (IWRM) is one of the most prominent concepts for water resource management which aims to combine the interests of different stakeholders for mutual benefit to protect human health, environment, fosters economic growth and agricultural development. IWRM also promotes grassroots level democratic participation because the practice of IWRM depends on involvement of communities and their chosen representatives. IWRM uses the catchment area of each river basin as the logical unit for water resources management. The ideal IWRM framework requires formation of institutional committees or working parties within a democratic structure to take account of each stakeholder's wishes and concerns.

The IWRM originated in the 1992 United Nations Conference on Environment and Development (UNCED) Dublin-Rio Conference on Water, which stated that a "blueprint of sustainability" should be paramount in allocating the use of this finite resource. The key focus of IWRM is to optimize the supply of water, whilst managing demand between different groups. In 2002, at the Johannesburg World Summit on Sustainable Development (WSSD), the Technical Advisory Committee of the Global Water Partnership has defined Integrated Water Resources Management (IWRM) "*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*," and emphasized that water should be managed in a basin-wide context, under the principles of good governance and public participation. The United Nations Development Programme (UNDP) claims that IWRM *"seeks to introduce an element of decentralized democracy into how water is managed, with its emphasis on stakeholder participation and decision making at the lowest appropriate level".*

The summits and mega-conferences including World Water Forum, Ministerial conference during the last three decades were essential in raising the international community's awareness on the necessity of sustainable water management and wise water management has been recognized as an effective way to improve quality of life. For example, during the Third World Water Forum (TWWF), which was held in March 2003 in Kyoto, Japan, the TWWF recommended IWRM as the practical approach to ensure sustainability of water resources. Besides, the Ministerial conference were also showed commitment for IWRM and also vowed support to enable developing countries to achieve the UN Millennium Development Goals, and for developing IWRM and water efficiency plans in all river basins worldwide by 2005, the target set at the World Summit on Sustainable Development. However, three decades of conferences have resulted in many commitments to IWRM that, unfortunately, were often not resulted as desired or expressed. There are several major NGOs involved with IWRM projects around the world. Some, such as the Global Water Partnership (GWP), primarily promote IWRM, whereas other environmental NGOs, including the World Wide Fund for Nature (WWF), promote IWRM as part of a wider 'Green' remit. At an NGO level, IWRM seems to have significant international backing, and appears to have little real opposition.

There are three hidden pillars on which WRM concept is totally buildup: These are Privatization, Commoditization, and Multi-stakeholder participation for cost recovery (O & M). Privatization and public-private partnership were extensively disseminated at the Hague forum, the Bonn conference, and the WSSD summit. Although the privatization concept presently discourages subsidies, it overlooks the fact that, in Europe, initial water infrastructure development was based on massive subsidies. Some critics fear that privatization may encourage fragmentation, which IWRM seems to overcome. Privatization of the marketable aspects of water may result in single-purpose planning and management, which raises a question of open information channels and transparency. Moreover, for the developing world where basic infrastructure is not yet complete, question remains of whether applying full cost recovery is ethical or practical. It is important to note that IWRM not only deals with water supply and wastewater treatment, but combines many other functions, including flood control, poverty alleviation, food production, ecosystem conservation, drought management, and sustainability, and government's presence is vital in the effective implementation of IWRM. Therefore, privatization of the water sector needs to be rethinking, and the issue's many facets must be considered far more than is happening in today's ideological debate. For the improvement of water infrastructure in the developing world, subsidies are vital. The principle of full cost recovery sometimes handicaps developing nations that are striving to provide basic needs by subsidizing their basic water infrastructure.

Although IWRM is the current buzzword of water resources development, future challenges remain in reducing the gap between theoretically agreed policies and implementation and the trends in which it leads. Reality is under the cover of "acceptable argument" The present style of IWRM is the water management international instrument in the era of corporate globalization and market orient economy. In the name of "balance" methodology and "participatory" and "multi-stakeholder" process it leads to access for corporations. Although its basic principle of IWRM is "holistic" approach against "Fragmentation", it never wants to address the issue of "corporate" and "Commercial" use of water.

Intensive and more research on IWRM concept are needed because, first of all, IWRM is defined quite in general terms which might be difficult to interpret for practical purposes. Secondly, due to intensified globalization, the IWRM concept contemporarily readily travels across nations and has already turned into a truly global concept. This transfer of IWRM occurs at multiple levels and constitutes high complexity, which is crucial to be understood. Every government's water related projects, every mega construction on water sources, every private entrepreneur of water, are very much 'vocal', 'concerned' and 'in accordance' with IWRM. On the other hand, most of the IFI funded projects have not been achieved its declared goals and objectives, day by day water becomes more costly and water issue's become more prominent, water becomes out of access of the common people.

Water is the common symbol of humanity, social equity, and justice. For example, the Ganges River in South Asia has a very strong spiritual and cultural significance to all Indians, Bangladeshis, and Nepalese. Unfortunately, the current IWRM mechanism does not acknowledge water's spiritual and cultural dimensions. Without recognizing these, all efforts towards sustainable water resources management may be piecemeal and ephemeral.

The traditional community expertise, knowledge has very little space in the IWRM, though it is very much needed on this aspect. People have developed considerable experiences and refined knowledge base through practice traditional wisdom and management of water resource management at community level for thousands of years. The people's traditional water management practice considers water as life; gives enough space for biodiversity, ecology and community people. There are lot of evidence that on the basis of popular wisdom, people takes initiative to solve water problem, caused by mainstream projects, where authority claimed that IWRM is properly incorporated. As case study: In Bangladesh, ADB funded Khulna-Jessore Drainage Rehabilitation Project (KJDRP) not only solve the waterlog problem caused by Coastal Embankment Project. Though the project authority claimed that it is one of the success example of IWRM, people on the basis is TRM (Tidal River Management) concept solving the issue.

IWRM has unquestionably become one of the mainstream initiatives discussed by governments. The major challenge remains not only its effective implementation in the field but also to redefine its core values. The conviction that IWRM can provide sustainable water security for every citizen into the twenty-first century has forced water professionals and IWRM to become more responsible to world citizens, especially towards the poor. The main hurdle lies in the practical implementation of the theoretically agreed-upon IWRM policies.

IWRM has been tried its level best to cope with first transforming situation in accordance with corporate globalization, privatization and commoditization of water. Current global scenario teaches us that in every where people, indigenous people have been fighting, struggling for their traditional water rights, access to water resources, water for livelihood; IWRM could be an option to initiate demand for pro-people water governance. Although IWRM is an International instrument, it can be used as platform to unmask the corporate, anti poor people national policies and process and global trade paradigm. To do so, People's Alternative Water Management Practice can play very powerful instrument to show people's empowerment.

Chapter One

An Overview of the Integrated Water Resources Management

1.1 Introduction

Water is a basic human need and access to minimum quantities of safe water (20 liters per person per day) should be everyone's right. Lack of access to safe drinking water, sanitation, and irrigation is directly related to poverty and poor health. For example, in South Asia 300 million people have no safe drinking water and 920 million people have no adequate sanitation (WWC, 2000). We are living in a world where, the industrial and domestic demand for water, pollution and degradation of water ecosystems are increasing and simultaneously the groundwater reserve is reducing at alarming rate. The United Nations estimates that 1.1 billion people lack access to safe water while 2.6 billion people lack access to decent sanitation. The UN's World Water Assessment Programme (WWAP) projects that by the middle of the 21st century, "at worst 7 billion people in 60 countries will be water-scarce, at best 2 billion in 48 countries." However, the water crisis is not mainly due to the water's limited physical availability but also linked with poor governance, inadequate infrastructure, poverty and inequality [UNDP 2006]. The water poverty (i.e. inaccessibility of water for the poor) is already manifested as a global problem as a result of the inequity in access among countries and within societies. Besides, the commoditization of water through privatization in disguise of better service delivery has been rapidly transforming the public water services, infrastructures and ownership into the greedy hand of Transnational Corporations (TNCs). Water is being bottled and exported; dams and waterways are constructed and owned by the water TNCs.

In response to the recognition that the key problem of water resources is linked with the "fragmentation" of water management by sectors and media, the concept of Integrated Water Resources Management [IWRM] came to development discourse to address the need for a more holistic & vision-oriented water resource management. The Global Water Partnership defines IWRM as the "Integrated water resources management is 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).

1.2 Objectives

The conceptual clarity among the stakeholders of IWRM is prerequisite for active participation. It has to be noted that one of the most cited definition of IWRM by GWP might be difficult to interpret general terms of the definition for practical purposes. Moreover, due to intensified globalization, the IWRM concept has already turned into a contemporary global concept. This transfer of IWRM occurs at multiple

levels and constitutes high complexity, which is crucial to be understood. On the contrary, there are people's experiences with historical knowledge base on water management at community level. People's practices have been considering water as elixir of life and provide adequate space for biodiversity, ecology and community people. It is ironic that though almost every water related projects, either by government or by private entrepreneur are very much 'vocal', 'concerned' and 'in accordance' with IWRM, the ground scenario is quite different. Most of the IFI funded projects have not been achieved its declared goals and objectives, rather making water more costly day by day and consequently water becomes out of access for the common people. The traditional community expertise and historical knowledge have not yet received the deserved space in the IWRM aspect.

Considering the above context, the present study has taken initiative to review the perspective of Popular Wisdom IWRM. The present study is focused on reviewing IWRM concepts and context to incorporate human dimension, specifically the voice of the unheard, disadvantaged and disempowered people.

1.3 Discourse and Challenges for Water Resource Management

Water resource discourse, like many others, is yet unable to overcome the global North-South demarcation of thought process. In most of countries of the Global South are mainly concerned about meeting basic human needs for survival, economic growth, employment, and poverty reduction. The Southern views on global freshwater management issues have been a considerably shaped by too much concern with economic growth, fears of soaring cost for implementing management policies, and general distrust about the policies of northern states. Developing countries also claim that the North should bear the financial burden of measures to reverse the ecological damage and implementing water development policies.

Eleven (11) challenges for achieving sustainable water resources management in the world:

Challenge 1. Basic needs and the right to health
Challenge 2. Protecting ecosystems for people and planet.
Challenge 3. Cities: Competing needs in an urban environment
Challenge 4. Securing food for a growing world population
Challenge 5. Promoting cleaner industry for everyone's benefit
Challenge 6. Developing energy to meet development needs
Challenge 7. Mitigating risks and coping with uncertainty
Challenge 8. Sharing water: Defining a common interest
Challenge 9. Recognizing and valuing the many faces of water
Challenge 10. Ensuring the knowledge base: a collective responsibility
Challenge 11. Governing water wisely for sustainable development

Source: The UN Water Development Report , 2003

The ultimate reckoning over North-South equity and responsibility still lies on future. To assure a meaningful and happy life for the poor of this world, better & prolonged cooperation between northern and southern countries is needed. In the large, low-income cities of Asia, Latin America, Africa, and the Middle East the major problems are typically a growing deficit of freshwater resources, overexploitation and contamination of groundwater, increasingly expensive source development, and underdeveloped wastewater management system with growing pollution, chronic financial problems, and inefficiency of institutions. At the village level, developing countries tend to suffer service and affordability problems. From the history of sustainable water development policy negotiations it seems that developing

countries have been willing to take action even though they did not secure the financial and technology arrangements they had demanded (Porter and Brown 1996). As for example, South Asia Water Vision 2025 is a balanced, committed, and dynamic approach of South Asian water professionals, though the main constraint to implement this well-balanced vision document into practice is financial and technological support.

The implementation of water development principles into reality is closely linked with the implementation of both national and international (trans-boundary) water development principles and the task to implement water development principles and achieve targets is enormous. For example to meet the UN Millennium Development Goal for water and sanitation (to halve the proportion of people without access to safe drinking water) by 2015, 342,000 people will have to be provided with sanitation every day until 2015 (UNU 2003).

The commitment of all concerned stakeholders on the in a concerted way is needed to overcome the challenges of achieving a secure water world. However, stakeholder's effort should not overlook the following multi-dimensional aspects of the water resource:

- **Water issues vary drastically according to the geographic characteristics:** Different geographical areas have different water problems and challenges. Many countries are facing difficulties for protecting surface-and groundwater resources (as e.g. evident in the difficulties in Europe of complying with the ED framework Directive). The greater fluctuation in resource availability associated with presumed climatic changes has already recognized as a major concern in many regions of the world. Besides, in many regions, water issues at national level depend on international co-operation (e.g. sharing an international river, tackling pollution of a regional water body, transferring water from one country to another).

- **The deterioration of water quality is a global phenomenon:** Water quality is deteriorating worldwide and in many locations around the world discharges of untreated domestic and industrial wastewater threatening ecosystems and human health.

- **Competition for a scarce water resource is increasing:** Conflicts and competition for water is a problem encountered in countries at very different levels of development (e.g. Southern India, Western USA, China). Similar conflicts also arise in multipurpose river schemes (USA, China), where stakeholders have difficulty in reconciling the needs of biodiversity, amenity and other kinds of mainstream benefits with other uses.

- **Water scarcity is hampering agriculture and increasing food security:** Agricultural water use makes up 70% of water withdrawals on average and this increase to 90% in some water-scarce regions. Irrigation systems are often scattered across vast rural areas, often with poor managerial control and service levels. Many countries dependent on irrigation have insufficient water for the expansion of agriculture (e.g. Middle East, China) and the maintenance of food security. South Asia and Southern Africa are now suffering excessive flooding in the wet season and water scarcity in the dry season.

1.4 Review of the current water resource policy approach

At the Millennium General Assembly of the UN September 2000, a target was agreed to halve, by 2015, the number of people without access to affordable and safe drinking water. It was further agreed that the unsustainable use of the water resources must stop. Achieving these targets will require a major change in policy approach. Water policies have been dominated by a supply-oriented policy framework and compartmentalized approach of policy implementation. One of the key reasons for the popularity of supply oriented policies is that they often led to the creation of sound and technically efficient systems for service delivery. However, the limitations of the supply-oriented policy approach are revealed, when change is required, which might evolve due to increased water demand, competition for water sources, rising environmental problems or large financial deficits. Often, financial difficulties result from upgrading Infrastructure, high operation and maintenance costs in combination with inadequate cost recovery. Expansion of the supply system may run into hydrological limits, entailing rising financial costs and environmental impacts to which the public is increasingly sensitive.

It is sad but true that mainstream water policies lacks the spirit of human rights approach to water. Moreover, the distinction between managing water as a common property natural resource and providing services for water users with human rights approach to water has not been fully recognized and consequently confusion regarding responsibilities prevails among the policy makers. Governments are becoming less willing or able to finance the growing deficits from free or underpriced water, and many cannot fund the escalating cost of new infrastructure. It can be envisaged that the ongoing "business as usual" policies might not be able to fill the policy gaps and generate the required funding levels. Water resource managers are still mainly concerned for the improvements of domestic water service and the process of modernization of water supply for agricultural water is at budding stage. The supply-oriented approach still dominates in agriculture, driven by fears of food insecurity. But other water stakeholders, not fully regarded in a compartmentalized water sector, are now making a growing claim on water resources. These include stakeholders concerned with the vital ecosystems, fisheries, tourism and recreation.

Any current or projected shortage of water should be addressed by investments in the creation of new capacity by the public sector funding with a very limited ambition for cost recovery. Expansion of the current system should take precedence over attempts to influence demand, improvements in the efficiency of delivery (e.g. adjusting pressure, reducing leakage) or reform of the supplying authority.

1.5 The Integrated Water Resources Management (IWRM)

Integrated Water Resources Management (IWRM) is a participatory planning and implementation process, that brings stakeholders together to determine how to meet society's long-term needs for water and coastal resources while maintaining essential ecological services and economic benefits. IWRM 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 ecosystem (GWP, TAC 2000). IWRM helps to protect the world's environment, foster economic growth and sustainable agricultural development, promote democratic participation in governance, and improve human health. Besides, the present study perceive that water conflicts among

agriculture, industries, cities and ecosystem protection activists can be reduced if the wider and integrative approach of IWRM is used as core policy framework to manage the water resource more sustainably.

IWRM principles: IWRM processes co-ordinate the development and management of water and other related resources for attaining water security and sustainability. IWRM has been emerging as an accepted alternative to the sector-by-sector, top-down management style that has dominated in the past. Worldwide, water policy and management are beginning to reflect the fundamentally interconnected nature of hydrological resources in the light of IWRM principles. IWRM Principles consider water as a finite and vulnerable resource and put emphasis on the importance of a participatory approach recognizing the special role of women as water users and equitable access to water for all and sustainability of vital ecosystems. The United Nations Development Programme (UNDP) claims that IWRM "seeks to introduce an element of decentralized democracy into how water is managed, with its emphasis on stakeholder participation and decision making at the lowest appropriate level"

The IWRM principles are guided by the integration, participation, consultation, gender awareness and consensus. In IWRM, the Integration context implies a concern with upstream-downstream relations, including land use, coastal zone management, a unified management of surface- and groundwater, a shift to management at a catchment or river basin level, and harmonizing water management with other sectoral policies with a collateral impact (trade, housing, energy, agriculture, etc). In addition, quantity and quality concerns need to be reviewed in conjunction.

The key principal components of IWRM are as follows:

- **Basin-wide water resource management:** IWRM looks at the entire hydrological cycle and the interaction of water with other natural and socio-economic systems. The same water can serve many different purposes, in different places. It is even possible for the same water to fulfill different purposes at the same time or sequentially, if proper planning takes place. IWRM focused on managing water resources at the basin or watershed scale, which includes integrating land and water, upstream and downstream, groundwater, surface water and coastal resources.

- **Optimized water supply:** IWRM involves conducting assessments of surface and groundwater supplies, analyzing water balances, adopting wastewater reuse, and evaluating the environmental impacts of distribution and use options.

- **Decentralized management of water resource demand:** The concept of water as an economic good distinguishes clearly between the value of water, assisting allocation processes, and pricing, being part of the cost recovery issue. The economic value of water is highlighted within IWRM through a greater stress on demand management rather than supply-side actions, a recognition (and estimation, where possible) of the economic value of water in different uses, acceptance of the notion of opportunity cost (what is lost to other uses from taking it for a particular purpose) and attention to cost recovery, though with concern for affordability and

securing access for the poor. IWRM encourage for adopting cost recovery policies, utilizing water-efficient technologies, and establishing decentralized water management authorities.

- **Democratic governance for equitable access to water resources:** IWRM is a political procedure with long-term gains that are vital to the sustainability of the resource base to ensure equitable access to water resources. However, IWRM require vision and political efforts and trade-offs through participatory, transparent governance and management to bring prolonged benefits. This may include support for effective water users' associations, involvement of marginalized groups, and consideration of gender issues.

- **Promote integrated policy approach and multi-stakeholder platform for decision making:** IWRM is an iterative method, in which implementing one policy or management tool may result in the need to modify others. IWRM work for establishing improved and integrated policy, regulatory and institutional frameworks such implementation of the polluter-pays principle, water quality norms and standards, and market-based regulatory mechanisms. Besides, IWRM also follows an intersectoral approach to decision-making, where authority for managing water resources is employed responsibly and stakeholders have a share in the process.

- **IWRM promotes creation of institutions and systems with holistic view to water:** The contemporary planning and operation of water systems is usually fragmented, causing a lack of co-ordination, waste and conflict. Moreover, water is frequently neglected when decisions are made about crop patterns, trade and energy policies, urban design and planning, all of which are critical determinants of water demand. The sustainable use of the resource through IWRM calls for the creation of institutions and systems that can transcend these traditional boundaries and involve a variety of users and other stakeholders.

1.6 The progression of Integrated Water Resources Management (IWRM)

As IWRM is the concept of water management in the era of capitalist globalization, the concept of IWRM, its guiding principals, its motive force, its implication and ground effect should be reviewed under the international perspective. According to Fortune magazine, "Water is one of the world's great business opportunities. It promises to be to the 21st century what oil was to the 20th."

There are several major INGOs involved with IWRM projects around the world. Some, such as the Global Water Partnership (GWP), primarily promote IWRM, whereas other environmental INGOs, including the World Wide Fund for Nature (WWF), promote IWRM as part of a wider 'Green' remit. At an NGO level, then, IWRM seems to have significant international backing, and appears to have little real opposition (Vann, 2004). A critical review of the evolution of IWRM from the UN Conference on Water held in Mar del Plata in 1977 reveals the historical process of over three decades that shaped the framework of IWRM in the international agenda are as follows:

- ***United Nations Conference on Water (Mar del Plata 1977):*** In 1977, the UN Conference on Water was held in Mar del Plata, Argentina. The Mar del Plata conference was a major prizewinning landmark in the history of water resources development & management, for the 20th century,

particularly for IWRM due to the active participation of the developing world and the discussions on various aspects of water management, specifically the country and region specific analyses. The conference considered water management on a holistic and comprehensive basis, an approach recognized as one of the key IWRM issues in the 1990s. The conference approved the Mar del Plata Action Plan, which was the first internationally coordinated approach to IWRM. The plan had two parts: a set of recommendations that covered all the essential components of water management, and twelve resolutions on a wide range of specific subject areas to avoid a water crisis of global dimensions before the end of twentieth century. It discussed assessment of adequate supply of quality water, water use efficiency; natural hazards, environment, health and pollution control; policy, planning and management; public information, education, training and re search; and regional and international cooperation. To provide potable water and sanitation facilities to all, and to accelerate political will and investment in the water sector, the conference recommended the period 1980 to 1990 as the International Water Supply and Sanitation Decade. Unfortunately, the Mar del Plata conference neither highlighted the trans-boundary water resources management nor comprehensively discussed to devise an Action Plan for it.

- ***International Conference on Water and Environment - Dublin 1992:*** Although a vibe generated through the Mar del Plata principles, after the Brundtland Commission Report (WCED, 1987), which laid the cornerstones to the concept of sustainable development in international policy, water issues are hardly addressed as international agendas. Fifteen years after the Mar del Plata Conference, water was back on the international agenda. The International Conference on Water and the Environment (ICWE) was held in Dublin, Ireland in January, 1992 has served as the preparatory event, to the Rio United Nations Conference on Environment and Development (UNCED) Conference to formulate sustainable water policies and an action program to be considered by UNCED. The major successes of the Dublin conference were that it focused on the necessity of integrated water management and on active participations of all stakeholders, from the highest levels of government to the smallest communities, and highlighted the special role of women in water management. The Dublin conference recommendations were later consolidated into Chapter eighteen of Agenda 21 in Rio de Janeiro, 1992. The conference reports set out recommendations for action at the local, national, and international levels, based on the four guiding principles. Principle one recognized fresh water as a finite, vulnerable, and essential resource, and suggested that water should be managed in an integrated manner. Principle two suggested a participatory approach, involving users, planners, and policymakers, at all levels of water development and management. Principle three recognized women's central role in the provision, management, and safeguarding of water. Principle four suggested that water should be considered as an economic good. The major limitations of the Dublin conference were that it was, for the most part, a meeting of experts rather than an intergovernmental meeting, and that it did not consider the outcomes of Mar del Plata. Unlike Mar del Plata, there was a lack of active participation from the developing world, which was later heavily criticized. The fourth principle became highly debated and was opposed by water professionals from the developing world. They argued that no water development initiatives could be sustainable if water was considered an economic good without considering the issues of equity and poverty. Many water professionals and decision makers from the developing world also criticized the failure of the participants to indicate how the principles could be implemented in the context of

complex water management scenarios in the developing countries. The shortcomings of the Dublin Principles would later be addressed in the Second World Water Forum and the concurrent Ministerial Conference in 2000. In spite of the aforementioned problems, current thinking regarding the crucial issues of IWRM is heavily influenced by the Dublin Principles.

- ***Second World Water Forum & Ministerial Conference (The Hague 2000):*** On 17-22 March 2000, the Second World Water Forum was held in The Hague, the Netherlands, with more than 5,700 participants including a range of stakeholders related to water management from the developing and developed world along with intergovernmental participants and experts. With the theme, *"From Vision to* Action*"*, the Forum brought together a wide array of invaluable views in reforming the water sector, better addressing the need to integrate water management. Unlike Dublin, The Hague Forum carefully considered the outcomes of previous water initiatives and acknowledged water's social, environmental, and cultural values. The participants of The Hague forum suggested applying equity criteria, along with appropriate subsidies to the poor, when systematically adopting full-cost water pricing. The Forum acknowledged that food security, ecosystem protection, empowerment of people, risk management from water related hazards, peaceful boundary and transboundary river basin management, basic water demands, and wise water management are achievable through IWRM. To meet the challenges related to IWRM, the Ministerial Declaration (WWC, 2000) called for institutional, technological, and financial innovations; collaboration and partnership at all levels; meaningful participation of all stakeholders; establishment of targets and strategies; transparent water governance; and cooperation with international organizations and the UN system. "Making Water Everybody's Business" was another theme. Water privatization and public-private partnerships were widely promulgated as means to achieve the vision objectives. However, many water professionals opposed privatization; arguing that the water sector is interrelated to many functions that demand government presence, i.e. flood control, drought alleviation, water supply, and ecosystem conservation (Shen & Varis, 2000). The Forum also acknowledged that the right to land and access to water is the key to breaking out of the poverty trap. Moreover, it was pointed out that water could empower people and women in particular, through a participatory management process. Unlike Mar del Plata and Dublin, The Hague Forum discussed extensively the main challenges to implementation and, afterwards the Forum's visions were converted into action programs for the participating countries. This led to the birth of the Global Water Partnership, which now plays a central role in coordinating the Framework for Action. The Second World Water Forum was successful not only for putting IWRM on the political agenda, but also for endorsing the active participation of the developing world's water stakeholders, and for gathering world water leaders and communities together.

- ***International Conference on Freshwater-Bonn 2001:*** In close co-operation with the United Nations, Germany hosted, in December 2001, the International Conference on Freshwater in Bonn. The aim of the conference was to contribute to solutions for global water problems, and to support preparations for the World Summit on Sustainable Development (WSSD) in Johannesburg, 2002, and the Third World Water Forum in Kyoto, 2003. The conference reviewed all previous water resources development principles and recognized that there was often a gap between policy development and practice. In a novel way, the Bonn Conference focused on practical

implementation, not only identifying challenges and key targets, but also recommending action programs to implement policies in the field (ICFW.2001). The Bonn Keys, which summarized the conference discussions, highlighted the key steps toward sustainable development through meeting water security needs of the poor, and promoting decentralization and new partnerships. To achieve these steps, it suggested IWRM as the most capable tool. The Bonn Conference recommended prioritizing actions in the fields of governance, mobilizing financial resources, building capacity, and sharing knowledge. The Bonn Recommendations for Action addressed, at the lowest appropriate level, issues such as poverty, gender equity, corruption mitigation, and water management. The Conference identified a set of actions necessary to mobilize financial resources: strengthening public funding capabilities, improving economic efficiency, and increasing official assistance to developing countries. In the field of capacity building, it prioritized the need for education and training regarding water wisdom, research, effective water institutions, knowledge sharing, and innovative technologies. The Conference also recommended that WSSD harmonize water issues with overall sustainable development objectives and integrate water into national poverty reduction strategies. The Bonn Conference should be commended by the water world for connecting the views of the developing and developed world and impartially divulging practical implementation problems. It also provided action programs, a historical milestone for making IWRM truly effective in the field. The key success of the Bonn Conference was the adoption of the Bonn Recommendations in the WSSD Plan of Implementation (WSSD, 2002).

- ***World Summit on Sustainable Development -Johannesburg 2002:*** The World Summit on Sustainable Development (WSSD), held in Johannesburg, South Africa, in 2002, should be recognized as a success because it put IWRM at the top of the international agenda. The WSSD's Plan of Implementation includes IWRM as one of the key components for achieving sustainable development. It provides specific targets and guidelines for implementing IWRM worldwide, including developing an IWRM and water efficiency plan by 2005 for all major river basins of the world; developing and implementing national/regional strategies, plans, and programs with regard to IWRM; improving water-use efficiency; facilitating public-private partnerships; developing gender-sensitive policies and programs; involving all concerned stakeholders in a variety of decision-making, management, and implementation processes; enhancing education; and combating corruption. For the most part, it seems that the Bonn Conference recommendations were adopted within WSSD, and IWRM has become the most internationally accepted water policy tool. The WSSD outcomes also encouraged major donors to commit themselves to implementing IWRM in the developing world. A number of broad strategic partnerships were declared at Johannesburg; the EU, in particular, launched a series of partnerships on Water for Sustainable Development with Africa, Eastern Europe, the Caucasus, and Central Asia. The international political recognition, at WSSD, of IWRM as the mechanism to achieve sustainable water management will dramatically and positively change the water world for the years to come. It is probable that IWRM will become the most integral part of all water initiatives, as was observed at the third World Water Forum in Kyoto, 2003.

- ***The Third World Water Forum - Kyoto 2003:*** Over 24,000 people from around the world attended the third World Water Forum, held in March 2003 in Kyoto, Japan. The key issues were safe, clean water for all, good governance, capacity building, financing, public participation, and various regional

topics. A two-day Ministerial conference resulted in the release of a ministerial declaration on a range of water issues, including water resource management, safe drinking water and sanitation, water for food and rural development, water pollution prevention and ecosystem conservation, as well as disaster mitigation and risk management. The forum again recommended IWRM as the way to achieve sustainability regarding water resources. The ministerial declaration addressed the necessity of sharing benefits equitably, engaging with pro-poor and gender perspectives in water policies, facilitating stakeholder participation, ensuring good water governance and transparency, building human and institutional capacity, developing new mechanisms of public-private partnership, promoting river basin management initiatives, cooperating between riparian countries on transboundary water issues, and encouraging scientific research. The ministerial declaration also vowed support to enable developing countries to achieve the UN Millennium Development Goals, and for developing IWRM and water efficiency plans in all river basins worldwide by 2005, the target set at the World Summit on Sustainable Development. Putting stakeholders and water ministers from around the world together in a Multi-Stakeholder Dialogue (MSD) table for the first time in water history was another key achievement. A range of organizations and countries-including the World Water Council, Global Water Partnership, UNESCO, UN-HABITAT, FAO, UNEP, IUCN, UNICEF, Australia, the Netherlands, the EU, and Japan—made commitments to develop the water sector.

1.7 Challenges in implementation of IWRM

Water is recognized as an economic good in many international declarations, such as those reviewed above, ***as*** well as in the policies of major lenders and donors. However, there is a risk in fostering the notion of water as a commodity, because it shifts the public perception away from a sense of water as a common good, and from a shared duty and responsibility. A simple and straightforward solution, designed on the basis of pure economic efficiency, has the potential of ending up unsustainable. The last three decades of summits and mega-conferences were essential in raising the international community's awareness of the urgency of sustainable water management. Over time, wise water management has been recognized as an effective way to improve quality of life. Three decades of conferences have resulted in many commitments to IWRM that, unfortunately, were often not resulted as desired or expressed. Although the IWRM has received the recognition as the most internationally accepted water policy tool, there are still many challenges for the implementation of IWRM. In IWRM, short term costs and disadvantages may seem more apparent than tangible benefits in longer term advantages. The future challenges for the IWRM remain in reducing the gap between theoretically agreed policies and implementation and the trends in which it leads. Moreover, integration does not guarantee the water equity for all. Besides, the mere involvement of the wider range of stakeholders in decision-making will not automatically assure their fair treatment. Establishing IWRM is a big challenge for governments and institutions as it generally can only be realized in long-term process of implementing numerous elements ranging from restructuring legal and institutional frameworks, investing in infrastructure, participating stakeholders in decision making to capacity building and establishing efficient monitoring and information systems.

The practice of IWRM depends on involving communities and their chosen representatives, using the catchment area of each river basin as the logical unit for water resources management. In practice, this might include local residents, local businesses, economic partners, experts, and other interested parties.

In an ideal situation, institutional committees or working parties are set up within a democratic framework to take account of each party's wishes and concerns.

There are three hidden pillars on which IWRM concept is totally buildup: These are Privatization, Commoditization and Multi-stakeholder participation for cost recovery (O & M). Although the privatization concept presently discourages subsidies, it overlooks the fact that, in Europe, initial water infrastructure development was based on massive subsidies. Some critics fear that privatization may encourage fragmentation, which IWRM seems to overcome. Privatization of the marketable aspects of water may result in single-purpose planning and management, which raises a question of open information channels and transparency. Moreover, for the developing world where basic infrastructure is not yet complete, question remains of whether applying full cost recovery is ethical or practical. The principle of full cost recovery sometimes handicaps developing nations that are striving to provide basic needs by subsidizing their basic water infrastructure (Rahaman & Varis, 2003). Therefore, privatization of the water sector needs to be rethinking, and for the improvement of water infrastructure in the developing world, subsidies are vital.

Water resource management by public or government organizations also has many success stories, e.g. in Finland and other European countries (Shen & Varis, 2000). It is important that IWRM not only deals with water supply and wastewater treatment, but combines many other functions, including flood control, poverty alleviation, food production, ecosystem conservation, drought management, and sustainability, and that the government's presence is vital in the effective implementation of IWRM.

The application of economic principles to the allocation of water should not be acceptable, water should not be treated as a market-oriented commodity when it comes to domestic use for very basic needs (Gunatilake & Gopalakrishnan, 2002), particularly for people in extreme poverty. In many developing countries, the very poor actually pay a great deal for water relative to their income, but these costs are often hidden. Water is priced by all urban societies, and the poor often have no choice but to pay high prices, spending between 5-10% of their income; however, in contrast in most industrialized countries, the lower-middle class spends 1-3% of their income on potable water and sanitation (Selborne, 2000). For example, in OECD countries, households spend about 1% of their income on water; on the other hand, in Onitsha, Nigeria, the poor spend as much as 18% of their income on water (Rogers et al., 2002).

The present style of IWRM in the name of "balance" methodology and "participatory" and "multi-stake holder" process it leads to access for corporate. Though its basic principle guiding thought is "holistic" approach against "Fragmentation", it never wants to address the issue of "corporate" and "Commercial" use of water. Although according to common people these are the root cause of major water disaster. More discussion, analysis, study, and commitment are needed in deciding whether water is a common or an economic good. Reality is under the cover of "acceptable argument"

Chapter Two

People's Alternative Water Management: Learning's from Bangladesh Experience

2.1 People's Traditional Knowledge on Water Resource Management

Water is the common symbol of humanity, social equity, and justice. For example, the Ganges River in South Asia has a very strong spiritual and cultural significance to all Indians, Bangladeshis, and Nepalese. According to mythology people considered River, water sources and water as Holy and source of life, and devised social bindings for not deteriorating the water sources. Consequently, people's traditional water resource management practices enable them to understand the component of ecology, its positive role on water management in their traditional eco-friendly livelihood.

People have developed traditional wisdom of water resource management through thousands of years practice on the basis of their cultural heritage, religion, ethics and livelihood practice. Unfortunately, the current IWRM mechanism does not acknowledge water's spiritual and cultural dimensions. Without recognizing people's traditional knowledge on water resource management, all efforts towards sustainable water resources management might be piecemeal and would be ephemeral.

Indigenous People's Kyoto Water Declaration

Our traditional practices are dynamically regulated systems. They are based on natural and spiritual laws, ensuring sustainable use through traditional resource conservation. Long-tenured and place-based traditional knowledge of the environment is extremely valuable, and has been proven to be valid and effective. Our traditional knowledge developed over the millennia should not be compromised by an over-reliance on relatively recent and narrowly defined western reductionist scientific methods and standards. We support the implementation of strong measures to allow the full and equal participation of Indigenous Peoples to share our experiences, knowledge and concerns. The indiscriminate and narrow application of modern scientific tools and technologies has contributed to the loss and degradation of water.

2.1 Case study on People's Alternative Water Resource Management

In the backdrop of the government's failure to resolve the people's suffering caused by water-logging, the coastal people had applied their traditional wisdom and devised an alternative drainage management concept on their own to reduce water-logging. For example, in the case of Dakatia beel, the mass involvement of local people to solve the water-logging problem has been internationally acclaimed. It has to be noted that since inception Coastal Development Partnership has been facilitating the people's struggle to resolve water logging issue. This case study is based on CDP's decade long learning through working with water-logged community and briefly documents the phenomenon of water-logging, its causes and effects, government responses, projects aimed to mitigate water-logging like Khulna-Jessore Drainage Rehabilitation Project (KJDRP) and the people's movement to solve the

problem with their traditional knowledge. It is interesting to note that though the KJDRP project failed to achieve its goal "to solve water-logging", the Government claimed it as a successful example of IWRM process. It has to be noted that the KJDRP project failed to develop an active partnership between public institutions and local stakeholders. This case study might offer new insights about traditional wisdom to address complex water resource management issues with eco-friendly approach.

2.1.1 The Characteristics of the Study Area

The study area encompasses the greater Khulna and Jessore districts in the south-west Bangladesh, excluding parts of Sundarban. The total area is about 8,000 sq. km.

Climate: The region's climate is salt-laden air throughout the year, especially when winds blow from the sea, humidity and saltiness increases to the south. The maximum and minimum temperatures usually range from 29°C to 4°C and 5°C to 15°C. Average annual rainfall during the period 1965 to 1990 was about 1750mm. The relative humidity ranges from 64-75% in the dry season and 75-87% in the wet season. The four distinctive seasonal weather patterns are: dry winter season, pre-monsoon season, monsoon season and post monsoon season. The dry winter season from December to February has infrequent rains, and river water becomes saline. The pre-monsoon and post-monsoon seasons are transitional periods, covering the months of March to May and October to November. During these two periods, cyclonic storms rise from the Bay of Bengal. The cyclones during the post-monsoon period are usually more destructive.

River System and its dynamics: The area is mainly drained by a number of north-south flowing rivers. From east to west, important rivers are the Gorai-Madhumati-Baleswar, the Bhairab-Pusur, the Bhadra-Gengrail, the Hari-Teka-Mukteswari, Sibsa, the Kabadak-Betna system and the Jamuna-Ichamati-Kalindi Rivers. Most of the rivers are tidal in nature and east-west Rivers are interconnecting with the north-south Rivers. Flows of these east-west rivers are very important for the complete circulation of tide all over the tidal flat. In the rainy season, water becomes fresh to slightly salty and in the dry season, it becomes salty. The inland rivers represent the remaining channels of the old spill or regional rivers, which have lost their connection to the mother river, the Ganges. The Kumar, Nabaganga, Kabadak, Bhairab are good examples of such inland rivers. The inland and regional rivers run into tidal rivers or estuaries mentioned above. In the greater Khulna area, the coastal rivers or estuaries are saline because of low freshwater discharges, especially in the dry season. The river flow regimes are driven by high, variable sediment loads. The rivers of this region show a continuous process of silting gradually from the NW towards the SE direction. Most of the river waters carry substantial amounts of suspended sediments.

Physiographic characteristics: Important physical characteristics of the study area are peat basins, tidal food plain and the Ganges floodplain. However, the case study is limited to the tidal floodplain. The tidal floodplain is bounded in the north by the Ganges floodplain and in the south by the Sundarban mangrove tidal forest and also crisscrossed by numerous tidal creeks or channels. The tidal floodplain is strongly influenced by tide, salinity and rainfall and has high drainage density. The average tide difference is about two meters. Most of the areas are between one to three meters above mean sea

level and have a southward regional slope. The water and the soil are saline but in the rainy season salinity becomes low. Fresh water flows from the upstream regions and the tides normally control the salinity of this region.

2.1.2 Historical background of water-logging and river management

The major portion of the study area is low-lying, barely one meter above the mean sea level and below high tide level. The livelihood of the study area is historically shaped through the interplay of tidal river system and the Sundarban ecosystem. Homesteads, roads, vegetable gardens and orchards were developed on areas artificially raised by digging ponds and ditches. Daily tides used to inundate the lowlands twice a day. The Sundarban mangrove forest drops an average of 3.5 million tons of natural debris per year which is carried by the tides throughout the floodplain. This natural debris and the stubble of the previous season's rice crop are decomposed in the water and produce nutritious organic food for all forms of aquatic life. When deposited on the land along with the heavy loads of silt carried by the tides, it also enriches the soil, and the silt compensates for the normal subsidence of the loose delta soil.

The study area holds around 400 year's old indigenous technical knowledge on river management. Since the 17th century, the Zamindars (landlords) used to build low earthen dykes around the tidal flats to prevent tidal intrusion and wooden sluices to drain off surplus rainwater. Their tenants then cultivated indigenous varieties of flood-tolerant and saline-tolerant rice and reaped bumper harvests. After the harvest, the dykes and sluices were dismantled, and the people grazed cattle and fished in the tidal floodplains. Thus, the environment, eco-system and bio-system that evolved in the coastal area were in balance. The problem of crop failure still existed, as dykes were not sufficiently high and strong. Opening the sluice gates was not enough and the gates were weak. These were temporary structures and needed repair every year. After ending of the Zamindary System, the maintenance of the traditional tide management structure is disrupted. As a result, the land-water management problems became serious and crop failure occurred frequently.

In 1959, to solve this problem, a large project on construction and maintenance of permanent polders was undertaken by the then government. In the Khulna and part of the Jessore districts, 39 polders were constructed to protect the arable lands from tidal inundation and flooding, and to increase crop production. In 1984, Dakatia beel, a part of one polder became water-logged for the first time, due to rapid siltation of the Solmari, Hamkura and Hari rivers. Later this problem spread to more polders. Moreover, lands outside the polders in the greater Jessore district went underwater. This problem is gradually creeping to the northern part as well as in the southern part of the embankment area.

2.1.3 Effects of water-logging on the livelihood

Environmental disasters such as water-logging, the silting-up of rivers and salinity have become common occurrences in south-west coastal region of Bangladesh and are causing inconceivable agony for the people. Water-logging destroyed houses, disrupted communication and the rhythm of daily life, killed off fruit trees and reduced the number of domestic animals. Only an insignificant area of land is cultivable in the dry season. Because of waterlogging, the fuel crisis became acute. The collection of

wood fuel and drinking water became increasingly difficult; human waste was thrown into water in the absence of dry land and farmers turned into fishers as agricultural lands were submerged. Many migrated to other areas as life became difficult to support. The pollution caused by the stagnant waters created epidemics of water-borne diseases. Schools closed and children were deprived of education. Hundreds of thousands lost their occupations and became destitute.

2.1.4 Asian development Bank (ADB) and Government Partnership to solve water-logging

The people were pressing hard for the formulation of an environmentally friendly project to mitigate the water-logging problem. But the Bangladesh Water Development Board (BWDB) failed to propose any project which would take proper account of the existing eco-system. When the affected people had rejected the Coastal Embankment Rehabilitation Project (CERP) and its successor CERP-2, the BWDB came up with the ADB-funded Khulna Jessore Drainage Rehabilitation Project (KJDRP). KJDRP with an initial estimated expenditure of US$62 million was the largest project of its kind taken up so far. The KJDR Project was approved by the ADB on 14 December 1993 and it was formally incepted in 1994 & ended in 2004. The total cost of the project was $44.9 million or 72% of the appraisal estimate of $62 million. ADB contributed $32.6 million (70%) of the actual project costs. The declared aim of the six-year KJDRP project was to 'solve the water-logging problem to increase agricultural production and alleviate poverty of the area through farm-based employment generation.' The project implementation authority hopes that if the project is implemented in time, about 100,600 hectares of land in 68 Unions under eight Thanas will become free from water-logging. As a result, about 800,000 people would benefit from a poverty-free and healthy life. But the plans had to be revised in the face of people's resistance and advocacy of NGOs. Later on a new drainage plan was taken up on the basis of the study by EGIS.

2.1.5 People's Alternative Water Resource Management: The Achievement of Community-based Grassroots Social movement

Fifteen years after the construction of the coastal embankments 1959, water-logging began to emerge in the polders. At the very start of the Khulna-Jessore Drainage Rehabilitation Project (KJDRP) in 1993-94, local people had expressed their doubts about the effectiveness of the project to mitigate water-logging. Because the previous ADB funded Khulna Coastal Embankment Rehabilitation Project (CERP) did not able to deliver people's expectations. The people apprehended that the project, if implemented, would worsen the situation and they were demanding a review of the KJDRP.

The people of the water-logged area have petitioned many times to the authority to solve the water-logging problem and the authority paid no heed to their grievances. As a consequence, people themselves took the initiative to organize and mobilize the community and devise plans for solving the problem by their own traditional wisdom. From their own experience and observation, people identified the polders as the main cause of water-logging and began to present their reasoned arguments for breaching or cutting away polders to allow tidal flows. Their logic was that if tidal flows can be made free, the navigability of the rivers will be restored, the enclosed lands will be free from water-logging, alluvium will accumulate inside the polders, and as a result the level of land will rise.

The first manifestation of people's logic was seen in September 1990, when the polder of Dakatia beel was breached in four places. Through one of the four cuts made in the embankment, Dakatia beel was again connected with the river Hamkura. Through regular tidal actions and the accumulation of alluvium, the land formation process resumed. Within two years, 2,500 acres of char (newly risen land) emerged between 1990 to1992. Even, paddy cultivation was found in the char lands in October 1992. The success in draining out water of Dakatia beel encouraged people in adjacent water-logged areas. They organized themselves and formed committees at different levels and took initiatives to turn their water-logged land into agricultural land again. Madhukhalir beel and Patra beel are examples of such collective efforts. On 29 October 1997, the people breached the right embankment along the Hari River a short distance above the Shol-gati to allow free access of tides to Bhaina beel. Interviews with local people, and a field visit in August 1999, showed that the average width of the Hari River downstream of the cut had increased by three times more than it had before the cut. The depth of the Hari River near Sholgati Bazar is about 35 feet. Upstream of the cut there is no silt in the water and water from the upstream beels drain out easily and they became partly free of water-logging. In the meantime, the Bhabadaha area (Jessore zone) started to experience widespread water-logging. The people of the area organized themselves and removed the accumulated silt from the exit of the Bhabadaha sluice gates every year, and opened a narrow drainage channel. Each year, they retrieved more land for agricultural production.

The KJDRP project of ADB showed resistance against socially acceptable solution like Tidal River Management (TRM) for reducing drainage congestion. In addition, the relentless advocacy ultimately convinced the Asian Development Bank (ADB) to critically review the KJDRP and, on the basis of the people's demand, they agreed, albeit partially, to go for an eco-technological solution to the water-logging problem: the Tidal River Management (TRM) concept. This resulted in some alteration of the drainage plans, in the context of specific ecological characteristics of the south-west coastal region.

2.1.6 The value of people's traditional wisdom

It is true that people's efforts could not achieve the desired results at every stage because of a lack of proper organizational structure and planning. However, the people's initiatives and innovative ideas drew the attention of the policy makers and donor agencies towards "People's Alternative Water Resource Management". A new era has begun where people's involvement in solving the problem of water-logging is quite sincerely ensured. The experience has proved that if people take initiatives to face their problems, they can expose the faults of any large engineering work that concerns their lives and livelihood. Even the KJDRP Project Completion Report, 2004 recognized that project implementation delays could have been reduced considerably if the beneficiaries demand for the TRM system had been appreciated earlier.

Chapter Three

Tidal River Management (TRM): Linking IWRM and People's Wisdom

3.1 Tidal River Management (TRM): Learning's from the people

The people developed the Tidal River Management (TRM) method to mitigate the water-logging problem of the south-west coastal region in Bangladesh. The manifestation of people's logic as "People's Alternative Water Resource Management" is later received the attention of the technical experts and the concept received popularity as the "Tidal River Management (TRM)". Coastal Development Partnership (CDP) provided an acronym PAWROM for the People's Alternative Water Resource Management (PAWROM). The Bangla word "PAWROM" means deep affection or close to the soul.

People's traditional wisdom was reflected in the fact that the resumption of tidal action had restored the balance that was lost when the supply of alluvium was cut off from the polder by the embankment. Tidal River Management method allows tidal flow into the wetland basin (beel) and releases the tidal flow back to the river. The main purpose of TRM was to get suspended sediment deposits gradually under a controlled system, going from tidal channels up to the mean high tide level in the waterlogged areas. This planned system means that deposits will be made in a certain site by a specific tidal channel. Later on, deposit sites may be shifted to other sites according to the topography of the area. Breaches may be shifted to ensure uniform silting within a basin. Depending upon the position of the water-logged areas, different methods of TRM may be adopted for different types of basins.

An ADB mission visited Dhaka from 29 August - 1 September 1999 to discuss with the Government of Bangladesh (GoB) the latest stage of implementation of the KJDRP. Based on the feedback of the project beneficiaries and suggestions received from the stakeholders, the ADB studied the TRM option in greater detail in terms of both technical feasibility and environmental and social impacts. They found that the 'TRM approach is technically feasible and attractive from social and environmental points of view'. So ADB decided to reformulate the project, taking into account the views of stakeholders.

> 'The beneficiaries rejected the initial project design for drainage network rehabilitation, leading to more than 3 years delay in project implementation. Structural engineering solutions proposed by the Project were not compatible with the needs of beneficiaries and local wisdom. In the end, the Project adopted the TRM approach proposed by local beneficiaries to resolve the drainage congestion problem. The OEM will assess the initial consultation process adopted by the Project, which resulted in proposed solutions unacceptable to local population. While the initial performance of the TRM approach reportedly seems encouraging, the OEM will assess the effectiveness, viability, and sustainability of this approach in Bangladesh and its replicability elsewhere in the region encountering similar problems.'
>
> Ganesh Rauniyar
> Evaluation Specialist, OED,ADB, Drainage issues in coastal zone
> Working paper WP 045, Program Development Office, Integrated Coastal Zone

3.2 Experts and People's Opinion on TRM

The KJERP has tailed to solve waterlogging issue but IWM authority in Bangladesh considered it as successfull case. But in a compilation they try to prove that those projects whishes are totally based on "Construction concept" are the most successful evidence of IWRM. KJDRP in their project document admitted that *"It is believed that the long standing problem of this area can be fully resolved by implementing people's participatory based model supported decision".*

Ranjit Bowali, a Community Leader from Jessore, Bangladesh and Convenor of the Bhabadah People's Committee to solve Water-logging believe as such *'TRM is our concept. We inherit it from our father Grand father. If Govt. accepted this before, such devastation had not happened but the government's implemented water management policy failed to achieve any success."* Sultan Ahmed, Leader of the Beel Dakatia People's Struggle committee revealed how TRM evolved that "*People proposed us on TRM. It is the people who teach us TRM and they implemented it on 19th May 1990. After that though Government agreed on TRM, but the water management program which they implemented is a failed case."*

Dr. Ainun Nishat, Country Representative, IUCN-Bangladesh perceive TRM as people's traditional Wisdom'.

Dhali Abdul Qaium of Water Resources Planning Organization (WARPO), Bangladesh described technical aspects of TRM approach as such *"Structural interventions (in the form of bigger polder, more regulators etc) to alleviate drainage congestion and water logging problems proved less effective. Tidal river basin management (TRM) approaches seem an effective and sustainable way forward. Under this scheme, a certain low-lying area within the polder is allowed to act as a retention basin, allowing the tidal prism to spread over throughout the basin during high tide. By this process, silt is deposited on the low lying areas making them higher; fluxes of water leaving the basin during low tide are silt free thus helping to keep the tidal channels deep. This approach has been tested in the field with encouraging results".*

Comparative Characteristics of Polder concept and TRM

Polder Concept	TRM Concept
Polder Concept is basically Dutch concept. Totally construction-infrastructure based concept. According this concept river basins are surrounded by embankments, river flows are regulated through regulators and sluice gates.	TRM concept is eco-engineering concept where component of ecology can play positive role to solve the issue. It is people centered & functions with bottom up approach.
It is too much costly and needs continuous monitoring, costly O&M	It is nearly costless and needs very cheap O&M
It is not sustainable because it has life time.	It is sustainable.
Its long term effect is negative. Due to polder concept based construction, rivers are silted within their beds, the velocity of water gradually decreased, ultimately rivers have been dying.	It has no such long term negative impact.
According polder concept silt issue does not consider positively. Positive role of silt for river Management was not considered.	It considers silt as positive component to Solve water logging.

Giasuddin Ahmed Choudhury, Chief Engineer, O&M,Bangladesh Water Development Board, Ministry of Water Resources, Bangladesh reveals how government is trying to include TRM into the IWRM. He described as such, *"A community focus participatory approach was adopted since June 1995. The community was associated with the project management in the preparation of rehabilitation and tidal river management (TRM) plans. The community was also participated in finalizing the design of the drainage structures and canal networks for ensuring effective drainage. The WMOs actively participated in the construction of perimeter embankments in some places by procuring land free of cost from the beneficiaries and helping the contractor to mobilize the labour force. WMOs help collect basic data and information through field surveys and disseminate information among the Beneficiaries".*

Tidal River Management (TRM) Review by CEGIS

'Water logging has been a major problem in the south western districts of Khulna and Jessore in Bangladesh. In order to solve the problem and to rid the area of its water problems, the government of Bangladesh designed a large-scale regulator, which was to be managed by the central government agencies. In order to solve these problems, a large-scale regulator was planned. CEGIS was called upon to conduct the Environmental Impact Analysis of this perceived solution to the areas problems. While going through that exercise, they discovered that the regulator-approach to solving the water logging problem did not meet with needs and alternative suggestions of the local population. In close cooperation with the local population of Khulna and Jessore, CEGIS designed the alternative for the large scale engineering option, which they dubbed Tidal River Management (TRM). After extensive analysis of both options, including socio-economic as well as institutional and environmental considerations, the TRM alternative turned out to be the most preferred way of solving the water-logging problems.

The TRM approach allows for local control and management of the resources in the KJDRP area. Its main challenge lies in the fact that this requires major coordination between the different communities in the area, structures which were missing when the TRM was implemented, and which are developed in parallel with the implementation of the TRM. CEGIS is currently engaged in facilitating a process through which Water Management Associations in the project area are developing their own integrated water resources management plans. This has been a participatory process through which a management structure is also evolving at the grass roots level. It is hoped that the experience of KJDRP will allow for the replication of approaches like the TRM in other parts of the country with similar water resources systems'.

Center for Environmental and Geographic Information Services (CEGIS)

The Case of the Khulna-Jessore Drainage Rehabilitation Project (KJDRP) in Bangladesh

3.3 Initiatives of the NGOs to promote IWRM & TRM

TRM is still a conceptual idea promoted by Non-governmental Organizations like Coastal Development Partnership (CDP) & Uttaran; later supported by the Environmental and Geographic Information Service (EGIS) and formulated by the Snowy Mountains Engineering Corporation (SMEC). However, TRM has some practical lessons based on the experience gained from Dakatia beel, Bhaina beel and other small beels. The Dakatia beel could be considered as an ideal practical example of TRM. After the breaching of the embankment of Dakatia beel, the Hamkura River became a strongly flowing river with 300 feet width and 30 feet depth at the new highway bridge on the Khulna-Chuknagar Road. The people transferred the TRM learning's from the Dakatia beel on other beels such as Bhainar beel, Golner beel, Bahadurpur beel, Magurkhali beel. In all cases, the TRM knowledge transfer proved successful and this

provided confidence to the NGOs to promote People's Alternative Water Resource Management concepts like TRM as a component of IWRM.

When the BWDB presented the plan for KJDRP, NGOs under the initiative of Uttaran opposed the proposals and demanded guaranteed people's participation in all stages of the project - from designing projects to their implementation - and that drainage plans should be ecologically sound. Local and national civil society organizations such as BanglaPraxis, Bhabhadah People's Struggle Committee, Coastal Development Partnership, Pani Committee and Uttaran have blamed the ADB for creating an ecological disaster by funding a project which, on the one hand, inundated several hundred hectares of land and on the other hand, caused rivers to dry up. The Association of Development Agencies in Bangladesh (ADAB), the national coordinating body of NGOs, and the Coalition of Environment NGOs (CEN) performed leading roles in the campaign. Widespread media campaign and a TV film broadcast over Bangladesh Television helped the advocacy to a great extent. The ADB suspended the implementation of the project in the face of continuous efforts of NGOs and the people's movement, to be taken up later subject to environmental and social impact studies (EIA & SIA), and scrutiny of their findings. The government and BWDB have accepted the TRM option (according to their understanding).

The NGOs and people's organizations continued to advocate for the adoption of the TRM concept for the whole project area. But the BWDB decided to develop one temporary tidal basin (Kedaria beel) in the north-western part of the project area, while managing, improving and closing the existing basin in Bhaina beel (which is reaching the end of its useful life). The BWDB also decided to drop the Kashimpur and Tiabunia regulators from the project. Although according to the original schedule, the KJDRP should have been completed by the end of 1999, due to various delays, the project finally came to a close on 31 December 2002, with the TRM concept implemented only in an infinitesimally small area in Kedaria beel. However, the BWDB now admits that the TRM is the best strategy for mitigating water-logging.

A write petition was filed on 13 August 2006, by the BELA and the BLAST seeking appropriate judicial intervention to address the sufferings of more than 100,000 people in 144 villages of the three upazillas of Abhaynager, Monirampur and Keshabpur of Jessore. Following the motion hearing, a division bench of the High Court has directed the concerned authorities to provide all such services, products, goods and other supports within their means that are required to ensure that the people of the affected villages of the three upazillas are safely located and are received food, water and other essentials during periods that water logging occurs.

Previously the government had undertaken the Coastal Embankment Project without taking into consideration its environmental impacts. As a result, a whole range of economic disasters such as water-logging and silting of rivers has enveloped the region. In turn, it brought about sufferings of unprecedented magnitude to the people. But the concerned authorities have tried to find solutions to those problems based on the same rigid perspectives and have failed time and again. On the other hand, the people, on the basis of their traditional wisdom and practical experience, have devised effective eco-technological strategies to successfully deal with the situation.

At present, the water logging problem has turned into a regular flood situation in some parts of Khulna, Jessore and Satkhira districts. In addition, KJDRP worsened the existing drainage problem due to the complete dried up of the rivers at Hamkura Bhadra, Arokhali, Buribhadra Jhapjapia, Teligtia. The Bangladesh Water Development Board (BNWDB) has been taking necessary measures since early 2006 to resume tidal river management (TRM) and has successes in East Khuskir Beel. To date most of the works have been completed and the local drainage condition has improved as a result. Now the focal point of the advocacy is to organize the people in favor of the Tidal Basin concept and to ensure the participation of the people in the decision-making process at all stages.

3.4 Challenges to link IWRM with People's Wisdom

One of the limitations of TRM is it is time consuming. It needs at least three to five years to silted up any polder. In this time the issue of people's livelihood becomes more important. Another limitation is, though it is people's centered concept, it needs strong and broader people's organization to implement this concept. So it need a longer preparatory to phase to develop TRM based plan. In addition, to develop proposal on the basis of this concept it needs institutional support, technical support. But the experts of the implementing organizations generally do not consider TRM in positive manner. Still now Governments, Mainstream Academicians Institutions does not approved TRM as an effective method for river basin management.

The drainage programmes that have so far been implemented on an emergency basis have failed to attain their desired goal on the one hand, and created new water-logging and river silting problems on the other. The programmes have also failed to gain people's confidence. People have themselves taken a number of measures to solve the problem of water-logging. Environmentally conscious local NGOs are conducting their advocacy programme based on this issue. This is such an innovative concept that it has no equal in Bangladesh. The advocacy programme has been started from the lowest grassroots level. Though some victory has been achieved, the reality is that the KJDRP is apparently 'convinced' of the TRM concept, but no full-scale investigation and data collection work has been done on the physical, environmental and other aspects of the coastal region.

It is imperative to properly realise the uniqueness of the coastal environment and to identify the areas where investigation and research activities can be taken up. The region has been subjected to different kinds of environmental imbalance and natural disasters ever since the implementation of 'development' projects that are clearly at odds with the region's environmental characteristics, and are ecologically unsound. No holistic attempt at investigation and research has been made to ascertain the negative impacts of river silting, waterlogging, salinity and other disasters on the life of the people -especially women and children and on their economic and family lives, on education, health, and hygiene. Yet, this is a task that cannot be neglected.

Only an eco-techno-logical approach may bring about real development of the region. The authority, entrusted by the people as policy makers and governors of the country, must be adaptable to the IWRM. They should develop the concept that 'ordinary people have the democratic right to say something about technical projects that may profoundly affect their lives and livelihoods.' People's voices should be

honored. Local people have been trying to take part in decision-making processes. Foreign experts come and go but they have no stake in the environment in which they apply their knowledge and skills. But the local people do. They have to stay there and survive. Any change in the environment profoundly affects local communities and the lives of the people. Therefore, if local communities have to achieve desired progress, they have to have more power in taking decisions. Abstract facts, data, and debates on different issues should be made simple, so that people can easily understand these issues, and realise their own roles in the development of their region, as well as the consequences that might follow, and what they should do in such eventualities.

IWRM has unquestionably become one of the mainstream initiatives discussed by governments. The major challenge remains not only its effective implementation in the field but also to redefine its core values. The conviction that IWRM can provide sustainable water security for every citizen into the twenty-first century has forced water professionals and IWRM to become more responsible to world citizens, especially towards the poor. The main hurdle lies in the practical implementation of the theoretically agreed-upon IWRM policies (Lahtela, 2001, Biswas, 2005). IWRM could be reduced to an idealistic buzzword if water professionals fail to overcome this hurdle. A practical challenge to the concept of IWRM is found at two levels. First, water is related to development and societies in countless ways. Its priorities and relative importance vary enormously from one place to another. Second, water must be seen as one factor in a broader context (Varis, 2005).

3.5 Recommended guidelines for future actions and policy directions

A number of lessons which are learnt from the long experience of establishing TRM could play as guidelines for future actions and policy directions on water resource management. Some the notable guidelines are as follows:

- Mere economic considerations (e.g. enhanced production of high yielding varieties of rice) should not encourage policy makers to adopt structural development projects, totally ignoring long-term environmental consequences.
- In the highly sensitive and fragile environment of the southwest coastal region of Bangladesh, where the lives and livelihoods of the vast majority of the people depend to a large extent on the sustainability of the ecology, traditional wisdom and experience of the people must be incorporated.
- Policy makers should not be misguided by the so-called 'highly-educated experts'. In problem identification, design and implementation, active participation of the grassroots stakeholder must be ensured to avoid the future hazard.
- Strategic Environmental Analysis incorporating traditional wisdom and indigenous practical experience must be done prior to any large development project.
- In any rural scenario, and especially in such a highly sensitive region as this, there is a strong linkage between the state of the environment and development. Short-term economic returns cannot compensate for a damaged environment.
- The NGOs, if they are to serve the people and implement development activities, must be environmentally knowledgeable. People's development cannot be achieved by ignoring

environmental issues and implementing development projects in an impressionist manner. Such perspective will be like filling water into a leaky bucket.

- NGOs working in the region must develop empathy with the people and adopt the perspective of the people as their own; only then will it be possible to alter the points of view of high level policy makers.
- Government should complement NGOs who are facilitating water users' associations, involving marginalized groups.
- All the organizations and agencies connected with the different stages of the development process must be responsible for promoting TRM and IWRM as people-oriented approach.

3.6 Conclusions

IWRM has been tried its level best to cope with first transforming situation in accordance with corporate globalization, privatization and commoditization of water. Current global scenario teaches us that in every where people, indigenous people have been fighting, struggling for their traditional water rights, access to water resources, water for livelihood; IWRM could be an option to initiate demand for pro-people water governance. Although IWRM is an International instrument, it can be used as platform to unmask the corporate, anti poor people national policies and process and global trade paradigm. To do so, People's Alternative Water Management Practice can play very powerful instrument to show people's empowerment.

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Ashraf-ul-Alam Tutu: The Founder of CDP

The year 2008 is a sad year for CDP. On 12th February, 2008 the founder of the Coastal Development Partnership (CDP) has passed away. Ashraf-ul-Alam Tutu was the founder of Coastal Development Partnership (CDP). Tutu was the freedom fighter in 1971 for independence of Bangladesh. After the great liberation war, he involved with different people's movement for their rights. He was one of the pioneer environmental activists in Bangladesh. After the inception of CDP in 1997, he provided leadership role on various issues of natural resource management, environmental conservation, human rights and good governance to ensure the sustainable development of the Southwest Coastal Region of Bangladesh. Tutu was one of the pioneer activists on monitoring Khulna Jessore Drainage Rehabilitation Project (KJDRP), member secretary of Sundarban Biodiversity Conservation Project (SBCP) Watch Group. He was International Committee (IC) member of NGO Forum on ADB; Chairman, Right to Food Movement, Member, Committee on Education and Communication (CEC) of IUCN; Bangladesh Chapter Coordinator Asia Pacific Network of Food Sovereignty (APNFS); Steering group member of Water for Peoples Network-Asia and Agribusiness Accountability Initiative (AAI)-Asia, and focal person/member advisor for different International, National & Regional Networks. He was the author of more than 40 books and his publications are widely published in different International journals.