# River Basin Management
# A Negotiated Approach

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# Preface

# PREFACE

Ecosystems have supported and nurtured human communities for several millennia. The restoration and protection of river basins is the best guarantee for the survival and well-being of large parts of the world's population. In many countries, gaining and consolidating access and control over river basins' natural resources is essential for socially and economically disadvantaged groups, who depend directly on these resources for their daily livelihoods. It is recognized that considerable efforts have been made during the twentieth century by governments all over the world, in terms of investments in dams, irrigation canals, water supply systems, hydropower stations, water purification and effluent and sewage treatment plants. This has led to macro level food sufficiency and reasonable supplies of domestic water in urban areas, albeit with the accompanying risks of hazardous chemical pesticides and fertilisers.

However, it is also true that the drinking water and domestic needs of most people, and the water needs of large areas of rain fed agriculture, have remained largely unfulfilled, in spite of these investments. Due to non-sustainable development projects, the capacity of river basins to provide water, food, shelter and security has been substantially reduced. With the withdrawal of the ecosystemic support, large proportions of populations in Asia, Africa and South America have been pushed into deprivation and poverty.

The fact is that even in what are considered the best-case scenarios by government agencies, vast areas and populations are likely to remain unserviced. To overcome this impasse, more institutions are calling for greater community or stakeholder participation. Water management has moved from the sectoral approach to an integrated approach, which has now been accepted as the key for solving simultaneous challenges of securing water, food and livelihoods, as well as protecting the environment. Internationally, the need for sustainable water management has been recognized in international conventions. Heightened interest in sustainable water management provides an opportunity for envisioning new forms of river basin management. Efforts are being made to rethink water planning and management.



*River Basin Management: A Negotiated Approach* sets out to present and discuss innovative approaches to river basin management. It reveals the results of a joint action-research project co-ordinated by Gomukh, India, and Both ENDS, the Netherlands and seven partner organisations. Through analysis and comparison of seven case studies, the publication generates a set of conclusions on the potential of river basin management based on local visions and experiences. It shows that the universal applicability of these experiences, which have so far been looked upon as isolated experiments or success stories, need to be acknowledged.

The conclusions are offered primarily to the national and international law and policy makers, to bankers and financial institutions, and to all other organisations that professionally deal with river basin management in particular and sustainable development and livelihood security in general.

We also offer them to the larger fraternity of civil society organisations, NGOs and all other practitioners who may have had similar experiences or would like to adopt a similar approach.

We hope that national and global decision-makers will find enough substance and merit in the conclusions to recognize the contributions that local actors can, and do, make to sustainable water management policies and interventions. If so, we trust that, as a consequence of such recognition, adequate changes in the current top-down and conventional approach to the development and management of water resources will be realized in the near future.

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# Prologue

# PROLOGUE

Gomukh located at Pune in Central India and Both ENDS situated in Amsterdam, the Netherlands, are civil society organisations (CSOs) with independent boards of directors and trustees. They share some common visions towards alternative water resource development and management strategies.

During their campaigns and lobbying activities, the two organisations realized that even though it is important to oppose non-sustainable, large scale infrastructure projects, it is equally important to develop management options, which are socially just, ecologically sustainable and economically viable. They also realized that such efforts, including traditional systems and current experiments need to be documented systematically in a language acceptable to national and international institutions and agencies like banks, funding groups, aid-agencies, research and policy institutions. Those institutions and agencies would then have clear alternatives and options to implement sound river basin management.

Both ENDS and Gomukh recognize that organisations involved in voluntary and participatory development often do not have the time or money to be able to analyse and document their own work. Consequently, their ability to convince people and mould policies is restricted. To overcome this, they drew up a project to compile and showcase a set of case studies where a 'Negotiated Approach' to River Basin Management was already being used in different parts of the world and in different geographical and socio-political environments.



The idea was not merely to document but to support and encourage the case studies. The main aim would be to formulate an approach for application all over the world and a set of policy recommendations. The case studies would allow for raising awareness amongst decision-makers and policy developers of the potential of bottom-up strategies for negotiated management of river basin ecosystems based on participation and appropriate technology.

One of the first initiatives to explicitly recognize local action as an integral part of water management discussions was the international 'Dialogue on Water, Food and Environment'. It recognized the value of local knowledge and initiatives, and tried to include local actors in policy discussions at a basin and national level. Local action was considered to be one of the three main pillars of this dialogue. The vision and actions by local organisations was recognized as valuable to the overall process. 'River Basin Management: A Negotiated Approach' has been supported through the Dialogue process.

**Project Partners**

Seven case studies were selected from over 100 cases submitted by organisations that showed interest in participating. Selected project partners have been engaged in river basin management for a relatively long period of time and have combined actual practice with discussing policies at a regional, basin or national level.

The case-studies reflect a three year section cut out of the total experience which had begun several years earlier and will continue long after the project. Each case represents a unique situation with a specific historical, cultural, political, religious and ecological background. The River Sand in South Africa has a set of revolutionary laws promulgated by a post-apartheid government, while the Cambodian case still has very fluid legal trans-boundary agreements. Unlike the Mekong River, which meanders through many countries, the Bhima Basin in India is a sub-basin of Krishna River that starts and ends within India. In Cochabamba, Bolivia, water management in a rapidly urbanizing environment is looking for a way out of the clashes between traditional rural water allocation systems and growing urban demands. The Peruvian and Thai cases lie at a high altitude where the upper watersheds have communities who still live in near natural environments. The Khulna-Jessore case in Bangladesh lies within one of the world's largest delta regions, characterized bij numerous tidal rivers.

Despite these differences, organisations achieved a common understanding. The first step on the road to collaboration was the development of a long term vision by the group.

The project aimed to strengthen the activities of the participating organisations by developing and implementing an action-research approach. This provided a framework for combining concrete activities of the partner organisations with the opportunity for analysing these actions through knowledge sharing, joint discussions and exchange visits. Thus, the project addressed both the individual, immediate priorities of the participating organisations as well as their shared objective of feeding policy discussions by representing their approach in a more generic, analytical way. Through this process, the project team was able to develop a common methodology, exchanging experiences and ultimately present a shared vision and proposal for a negotiated approach to river basin management.



**The Unifying Vision**

The major driver for this project is the assumption that non-sustainable management practices will continue as long as viable alternatives are not presented.

The underlying methodology, processes and delivery mechanisms outlined in this publication take accepted principles for river basin management which the case holders can implement beyond their own sub-catchment areas. Ultimately this can encompass entire basins, so that the growing needs of the increasing population for the next 50 years for water, food, sanitation and healthy ecosystems are met in a manner that is environmentally sustainable, socially just and economically equitable.

**About This Publication**

*River Basin Management: A Negotiated Approach* does not offer 'best practices' or all-applicable solutions. Instead it builds its analysis on real life experiences, including both successful and less successful attempts to implement and scale up local water management techniques.
It builds on action research, proposes what can be achieved and how. It sets

out to go beyond general policy analyses, which tend to describe `what is' or propose recipes that are based on theoretical research. Thus, its key strength lies in learning based on real life experience.

The publication introduces each of the case studies in its unique ecological, socio-political and economic context. It describes each experience with issues such as water harvesting, large scale water infrastructure and the involvement of many different stakeholders. Institution building is also explained. Basic fact sheets of each case-study can be found in the appendix.

It then presents an analysis of conventional approaches to water management and development, introducing the negotiated approach as a viable and sustainable option that has evolved from contemporary and traditional practices. Three major issues are analysed relating to river basin management from a local perspective: negotiation and participation, appropriate technologies, and the ecosystem approach.

The analysis invites people to look again at the concepts and methodologies prevalent today, and open their minds to the possibility of engaging with and learning from local actors. The results of the analysis of the individual cases and broader issues related to each specific approach, shows that local actions and vision do make a contribution to sustainable river basin management. Stakeholders from a community level are able to negotiate a reasonable 'give and take', and should therefore be recognized as fully-fledged actors in any water policy design and decision-making process.



The project concludes that local action can engage in higher-level, larger scale river basin management. In fact, it is a 'must' for these organisations, since their actions affect other stakeholders, and vice versa. Such engagement through negotiation will lead to more sustainable and equitable river basin management, without stopping economic development processes. Governments, donor organisations and international institutions do have a major role to play in effectively engaging local actors. The publication ends with a list of conclusions and suggestions for follow-up activities for them, as well as for interested civil society organisations and academia.

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# Introduction

# 1 INTRODUCTION

The world is in the midst of a revolution in the thinking and practice of water management. A deep appreciation of the complex issues surrounding water resource development has led to new approaches that seek to meet the ecological, social, political and economic challenges posed by the prevalent practices. This publication offers 'The Negotiated Approach to Integrated River Basin Management' as an effective variant of the IRBM method currently adopted by many international and national institutions.

## 1.1 The Context

The emergence of a fresh water crisis during the 20th century had its roots in the grossly unequal geographical distribution of freshwater, exacerbated by a mainstream approach to resource management that created pockets of abundance in a sea of scarcity. Moreover, there has been a tremendous population growth in precisely those areas where water is lacking, further aggravating existing inequitable supply.

The resulting crisis has left vast stretches of the Third World with a chronic and increasing degradation of ecosystems, social upheaval and economic deprivation.

Water management today poses multi-dimensional challenges, with complex geographical, ecological, social, political and economic factors. Uneven geographical distribution of water, both globally as well as within nations, is by far the most fundamental issue at the heart of all water-related problems and solutions. The North has a far more uniform natural distribution of water than the South. It is therefore Third World countries who are generally characterized by their patchy distribution of water. But critically it is not absolute amounts that are the cause of any problems: it is the irregular distribution of water that results in social, political and economic challenges.



**Population Density**

The problems caused by the uneven distribution of natural water sources in the Third World are aggravated by high population density in precisely those areas where water is most scarce. The North and South American continents have copious amounts of water and low population densities, as does Western Europe. But South Asia, China, Africa and the Middle East havelarger and faster growing populations and smaller quantities of useable water resources. In India and China for example, the populations have doubled and the annual amount of water available per capita has fallen from 1800 $m^3$ and 2200 $m^3$ in 1990 to 1600 $m^3$ and 2000 $m^3$ respectively by the year 2002[1]. Assuming that annual per capita availability of less than 2000 m3 is considered to be a scarcity, over 2.5 billion people have been pushed below the water scarcity threshold. More disturbingly, the World Bank Little Green Data Book predicts that if the current population trends continue, the per capita water availability in developing countries could sink below the extreme scarcity threshold of 1000 m3 per person per year by the year 2007.

[1] Source: Aquastat Information System on Water and Agriculure, FAO,2002.

While technological projects such as dams and complex distribution systems can, and have, helped to reduce these water shortages, it is equally true that they have been unable to completely satisfy the water needs of the entire population. Therefore, it has become imperative to make all sections of the community aware of the challenge to change the way people use, manage and distribute water.

**Pollution**

Another important dimension of the water crisis is the all-pervasive pollution and contamination of almost all our freshwater bodies and groundwater aquifers. This causes problems of water availability, especially in the Third World. Here rates of groundwater abstraction have more than doubled in the last three decades, while at the same time, more than 80% of the effluents and sewage are released untreated. According to the United Nations2, two million tons of waste is disposed of in rivers and lakes everyday, generating 1500 km3 of wastewater annually. This aggravates water scarcity by making even the limited sources of drinking water unusable.

The irony is that such pollution affects the poorest communities the most, because they have neither access, nor the means to buy clean water. Strict enforcement of anti-pollution laws and procedures, and simultaneous changes in water-use policies would help to improve the situation. But here again technology alone cannot provide the solution. It is often the deprived sections of society that cannot negotiate or even force politicians and bureaucrats to 'manage' water rationally and fairly.



**Water-related Conflicts**

Besides the unequal distribution, and the rapidly increasing degradation and pollution of water bodies, the third element of the water crisis is conflict. International debates on natural resources management recognizes that increasing scarcities and systematic appropriation of ownership rights by the rich, inevitably leads to conflict over rights and entitlements to land and forests, even though these are often publicly owned by governments or held in trust as community pool resources.

Most conflicts have their base in rivers' natures, namely that there is always an upstream and a downstream. For example, when urban and industrial users abstract large quantities of water and release pollutants in the upper watersheds, the quality of pure water for downstream users is jeopardized. Similarly, when water-intensive crop cultivators draw up non-sustainable amounts of water, small farmers lose out, giving rise to another upstream-downstream user conflict. Excessive irrigation, often termed 'flood irrigation', in certain areas causes surrounding waterlogging and salinity, also leading to periodic conflicts. Furthermore unplanned or excessive extraction of water in upstream forests and reservoirs leads to low water levels in downstream reservoirs. This has led to skirmishes in many parts of the world.

Often diverting the water for hydropower has aggravated scarcities for irrigators and urban users downstream. Dam construction has caused maximum distress and conflicts. Big dams invariably cause serious problems of forced human displacement, resettlement and rehabilitation of communi-

ties, leading to social disruption, aggravation of inequity, related to access to water, and create a conflict between host communities and resettled households. Similarly, the construction of barrages or diversions in one region or nation upstream of a river basin regime creates scarcities, or floods -the so-called 'unavoidable shock releases'- in a region or nation located downstream. The large transfer of water from one river basin to another through dams or hydropower projects creates sudden low discharges of water in estuaries, causing huge losses in fish catches and depletion of aquatic biodiversity; creating new sandbars and destroying mangroves. All these events create the potential for conflict between communities, nations and peoples. Large scale infrastructure projects often too lead to reallocation and distortions in public finance budgets in other sectors causing conflicts within and between departments and their communities.

There are three dimensions of conflict. The first is the emergence of direct competition for water as an increasingly scarce resource. The second conflict related to large scale infrastructure projects, particularly those that see people displaced and other social and environmental impacts farther afield. The third dimension of water-related conflicts is disputes over the appropriate levels and roles of various stakeholders in river basin management.

**Governing Water Resources**

According to the United Nations World Water Development Report, 'The basic principles of effective governance include: participation by all stakeholders, transparency, equity, accountability, coherence, responsiveness, integration and ethical issues.'



Until now the issue of governing water resources has not been highlighted in the various debates and deliberations on water. Water management and development is a deeply political process, which palpably affects social as well as economic structures. Governance of water is not only related to the formal political process. Experience shows that good water governance is crucial for diminishing conflicts over water use and ensuring its sustainable use. It is only through good governance that water use can be regulated. As we shall see the state is very often the catalyst in initiating positive changes in water use.

## 1.2 Approaches to Water Management

All water management techniques have complex and multi-dimensional implications, related to the existing geographical, ecological, socio-political and economic situations. However these techniques need to be modified, updated and adapted in response to changes in the existing order, or if the primary objectives of adequate and equitable supply and sustainable use of water resources are not achieved.

Three approaches to water management will be outlined in this publication: Two conventional approaches: Techno-economic Approach, Integrated River Basin Management (IRBM), and the Negotiated Approach to IRBM. The first two constitute the prevalent approaches to mitigating the water crisis. The last represents a pioneering approach that is being tried out in the case

studies of the project. It promises to provide solutions for the sustainable and equitable water supply and management that the existing approaches have failed to do.

**The Techno-economic Approach**

The techno-economic approach has been the conventional, or 'mainstream' approach throughout the latter half of the twentieth century. It has been driven by population growth, changing standards of living and the expansion of irrigated agriculture.

Water planning and development under this system is based on projecting the numbers and demands of future populations. At the very outset, it is assumed that populations will rise, along with water needs. It is anticipated that there will ultimately be a shortfall in the amount of water, which can be supplied to an ever-growing population. The main focus of management then becomes an exercise in bridging the anticipated gap between supply and demand. This leads planners to build ever larger, centrally managed dams and supply systems, and to develop river diversion and canalization schemes.

There is no doubt that this approach has solved some of the short term crises of availability that plagued the countries of the Third World during the mid-twentieth century. Food production, availability of power, and access to water have all increased for significant numbers of people. However, the long term adverse effects of such large scale interventions on the natural environment, and on human communities raised doubts about such projects and this in turn led to a new way of looking at water management.



**Integrated River Basin Management**

Integrated River Basin Management (IRBM) is essentially a work concept that aims to conserve and utilize the natural resources within a river basin sustainably, through integrating the needs and skills of various stakeholders like government departments, academics, farmers, and the private sector.

IRBM has been gaining increasing acceptance and is formally a part of mainstream government planning. Unfortunately however, it is increasingly clear that, IRBM as it was first envisaged, is not being practiced in its true spirit. Water management continues to be a centralized, rigidly controlled affair. As we shall see, such a 'top-down' approach causes more problems than solutions.

**The Negotiated Approach to IRBM**

The negotiated approach is a variant of conventional IRBM. It is based on the collective vision that: 'Sustainable and equitable water resources will be enhanced through a negotiated approach that recognizes the river as a unit and embraces local level initiatives, while simultaneously adopting an integrated and ecosystem approach to basin management'. The addition 'negotiated' explicitly indicates that this approach is aimed at creating space for negotiation, including with local stakeholders, on river basin management options. This publication argues it is a viable management solution to

the grievous water-related problems that afflict ecological and social structures and the economic well-being of large sections of the population all over the world.

Negotiation occurs at and between the local, regional, national, and international governance levels. The 'negotiated approach' includes and responds to local initiatives. It starts from the basis that management policies should build on existing local practices of integrated land and water use. It recognizes the potential of local resources and knowledge to meet the challenges of integrated water management. It does not call for decentralization or the implementation of the subsidiary principle. These are essentially top-down approaches that would allow local stakeholders to take only those decisions that directly concern them. The negotiated approach calls for the reverse, allowing local actors to develop basin management strategies specific to their local context, which are then incorporated in the larger basin management plan. This allows their knowledge to influence regional and national decisions, ultimately resulting in a truly bottom-up process of policy development and management.

This approach to river basin management needs to be conducted within a framework of water resources management that recognizes the links between people and their environment. Given the diversity of ecosystems and livelihoods, and the importance of context, the process of management must take into account different options and scenarios. Management policies cannot therefore follow a blue-print but need to be flexible and responsive. Negotiated approaches are built on genuine participation and guided by the roles and functions associated with the management of specific river basins.



A 'rights and risks' approach is a practical and principled basis for identifying all legitimate stakeholders in negotiating development choices and agreements. The approach assures the assessment of risks in the planning and project cycles, assuring an understanding of how, and to what extent, a project may affect people's rights and livelihoods.

It is possible to adopt a negotiated approach within any existing legal and institutional framework. In fact, negotiated approaches are both about developing appropriate legal frameworks and participatory platforms as well as putting in place an integrated, bottom-up approach to IRBM.

# 2 Journeying through Seven River Basins

# 2 JOURNEYING THROUGH SEVEN RIVER BASINS

There are diverse socio-economic and ecological conditions encountered by the project partners of this project. The river basins in which they operate are places where local communities and Civil Society Organisations (CSOs) have tackled challenges of water resource management, development and delivery systems through local initiatives. The cases represent complex situations where real politik and ecological systems have to be understood as legitimate concerns for the river basin.

A large number of such initiatives have been documented by international bodies such as the 'World Water Actions', cataloguing over 3000 local water management initiatives for the Third World Water Forum held in Kyoto in 2003. However, so far, these experiences are looked upon as isolated experiments or success stories, whose universal applicability has not been fully acknowledged.

Let's first journey, in print at least, with the case holders to the seven river basins documented in this publication. Let's witness their unique ecological, social and political conditions and the approaches at stake to water management, both mainstream and unconventional.

On our journey, we will encounter the obstacles and resistance that local initiatives often grapple with. We will also discover how local communities, civil society organisations, and researchers, have come together, interacted with policy makers and implementing agencies to find appropriate solutions to the many challenges that they face.



## 2.1 Cotahuasi, Peru: The Journey Begins

Our journey begins in the upper mountain ranges of the highlands of Cotahuasi, at 2600 meters above sea level. The deep canyons of the Ocoña River Basin are rich in biodiversity. However years of socio-political unrest during the 1980s have intensified acute poverty and illiteracy. It has also strongly undermined many forms of social organisation. The inhabitants of the area are still rebuilding their shattered lives. Being a remote area, state support for development is difficult to get.

Farmers work in fields of quinoa, maize, alfalfa, potatoes, peas and wheat. The inhabitants of this region have a rich knowledge of traditional methods of organic farming and pest control. These long-established agricultural practices were encouraged by the voluntary organisation AEDES, so as to increase incomes and standards of living in the Cotahuasi sub-basin. As a follow-up step, AEDES encouraged the empowerment of local communities in decision-making, capacity building and the introduction of new crops like Amaranthus, which would be financially lucrative in the international market. From the discussions with different groups of stakeholders, sustainable water management was identified as key for the development of the area.

The diversity of stakeholders makes sharing water a complex issue in which class, ethnicity and gender issues figure prominently. Over the past ten

years, AEDES has initiated round-table negotiations, called mesas in Spanish, with many different stakeholders, which have helped resolve several issues and re-established communication between various stakeholders. Now, these mesas are being connected with regional and national water negotiations, amongst others through the nationally operating Institute for the Promotion of Water Management (IPROGA).

The innovative *mesa* is a distinctive element of this initiative. Private individuals as well as public institutions, including the city mayor and CSOs, are part of working groups for policies and programmes related to water resources development, allocation and management. The *'mesa'* is used for negotiating with state authorities about changes in existing laws related to land and water use.

This has resulted in a joint proposal for declaring the watershed a protected area. Thus, eco-tourism and organic agriculture continue to be promoted as an option for economic development. Simultaneously, it prohibits opening up the area for non-sustainable activities like mining, which would ultimately lead to the destruction of resources and income opportunities. The proposal was successful. On May 18th, 2005 the Peruvian government declared the Cotahuasi sub-basin in the Andes in Peru a 'Landscape Reserve in the National Protected Area system'.

The Cotahuasi initiative shows how water is key to both biodiversity conservation and the development of sustainable agriculture. In addition, it shows how a sustained process of empowerment and local institution building allows people living upstream in a remote area to negotiate the protection of the basin resources with the downstream population.



## 2.2 The Urbanizing Farmlands of Cochabamba, Bolivia

Our next destination, on from the windswept highlands of Cotahuasi, is the Cochabamba valley in Bolivia.

The landscape here is a complex collection of different traditional irrigation systems, where water for irrigation is shared and rotated in accordance with traditional practices. However the urban areas of Cochabamba have encroached into the adjacent agricultural lands. A population growth rate of 12% a year has led to the severe depletion of groundwater resources and acute water pollution. This has resulted in conflicts between the urban and rural populations. Moreover, intensive agricultural activities have severely strained the region's land and water resources. Meanwhile the protective forest cover is fast disappearing.

The legal and administrative structure does not have a uniform system for registering water rights and the government's decision to privatize drinking water resulted in a hike in water fees, leading to a violent conflict. The socio-political situation in Bolivia demands an approach to basin management from the bottom up that concentrates on establishing opportunities for creating and strengthening dialogues between local actors and state agencies.

A community-based organisation that represents six irrigation systems, called ASIRITIC (Asociación de sistemas de riego de Tiquipaya y Colcapirhua),

has cautiously started to negotiate with the government and other stakeholders to find an acceptable solution to providing water for irrigation. Also, the local water supply systems association, ASOCATI, is involved in the discussions on water rights and assuring sustainable and equitable water provision to the rural and urban population.

Centro A.G.U.A. (Centro Andino para la Gestion y Uso del Agua), a research centre based in the local San Simon University, supports participation of local actors such as ASIRITIC and ASOCATI by helping them to negotiate. They provide not only technical analyses and information, but also facilitate their participation in decision-making processes and institutional policies in the rural community of Tiquipaya.

Given the dynamic, highly unstable political context of Bolivia, progress has been slow. However, gradually the sustained efforts and the flexible support strategy are increasing the presence of the local stakeholders in negotiation processes in the valley.

This case shows how the negative impact of urbanization on agriculture, creating competing interests for water resources, can possibly be solved through negotiations between stakeholders themselves. However they must be allowed to develop negotiation skills and given time to develop the process in the face of regular setbacks.

### 2.3 Se San River Hydropower Projects: Vietnam-Cambodia

Our next stop finds us in northeastern Cambodia, under the shadow of the Vietnamese Yali Dam. The dam is the first in a series of hydropower dams on the Se San River, which is an important tributary of the Mekong River.



Construction of the dam started in 1993. Local people in Cambodia living downstream on the Se San were not informed about the construction of the dam. They only got to know about it in 2000, when the environmental impacts, such as unusual flooding events and strongly declining fish populations, were felt by the downstream Cambodian villagers.

The Se San Protection Network (SSPN) was formed with the help of an existing local NGO network (Non Timber Forest Products: NTFP-network). The SSPN mandate includes voicing the concerns of local communities in local, national and international platforms, negotiating changes in the operating regime of the dam, and stopping the construction of related dams.

The SSPN started by creating its own knowledge base on the Se San basin and the impact of the dam upon it. It collaborated with policy research and capacity building organisations like the Australian Mekong Research Centre (AMRC) and international NGOs, developed close contacts with local governments, and entered into negotiations at regional and national level with government ministries and the Mekong River Commission.

The Se San River case study represents the type of complex situations that arise in the case of water management issues in international river basins. In such cases, the complexity of stakeholders' interests increases and their

problems are magnified. This makes greater efforts for conflict resolution and negotiation necessary.

The SSPN and AMRC have concentrated on documentation, lobbying and advocacy. They have kept up a persistent stream of research documents and position papers that has enabled the network to gain recognition from the Cambodian government for the local grievances and proposed alternative management options. Their efforts in seeking dialogue are starting to have an impact in neighbouring Vietnam. Their representatives are now aiming for a legitimate place at the negotiating table of the National Mekong River Committees.

### 2.4 Nan River Basin: Northern Thailand

As we enter Nan province, we see how people's participation in diverse issues, particularly those related to environment, is an intrinsic part of day-to-day reality. We see enthusiastic college students rallying around the *Hak Muang Nan* movement, a province-based group working on environmental and social justice issues, which has the highest participation index in Thailand.

The Nan Civil Society Co-ordination Centre (NCSCC), which functions from within a small provincial hospital, has been working in the field of water management for ten years. Competition for water resources in the Nan basin exists at all levels, between different interests and user groups, between different users within communities, between upstream and downstream communities, between communities and business interests and between communities and state authorities.



Out of discontent with present, centrally-led policies that pay little or no attention to local needs and knowledge, the NCSSC has become involved in water management discussions. The NCSCC has studied the traditional ways of managing conflicts used by the indigenous peoples of the Nan basin, as a first step towards informing national and state level decision-makers.

Their research shows how, given a chance to interact directly, communities resolve their problems and reach sustainable solutions. One of the NCSCC studies shows how villagers achieved their own voluntary compensation mechanism. The beneficiaries of the dam agreed to assign farmlands to the affected families. In a conventional, top–down system, such a step could have led to a permanent rift between the 'majority and minority' sections. The NCSCC-research is becoming the basis for local people's engagement in discussions with regional and national stakeholders on compensation, water-related legislation and water pricing.

Throughout the Nan basin we find the typical deadlock where the mainstream approach completely disowns the traditional water harvesting systems like the *muang fai*, as it focuses on high-tech, non-sustainable measures like the Kok Ing Nan river diversion. Likewise the Thai government is promoting the creation of river basin authorities that lack genuine representation from local communities. The community-based organisations that work with the NCSCC prefer the traditional water harvesting systems. The use of appropriate technology, such as substituting wooden structures with

concrete ones, has enabled them to increase efficiency and meet the demands of a growing population for food and water.

The NCSCC proposes that local management approaches based on traditional water management systems, are well suited to meet the increasingly severe social and economic challenges related to water. The initiative shows that it is possible to move from conflict to negotiation, through peaceful and mutually beneficial dialogue. It calls for the inclusion of these actors in decision-making processes and institutions.

### 2.5 Kolwan Valley, Bhima River Basin, India

In the much drier Kolwan valley, we find ourselves on the Bhima River, a large tributary of the River Krishna that flows through two Indian states. Continuous water disputes have severely marred relations between the two states.

Large dams dot the landscape of the Bhima Basin. State policy has consistently favoured the construction of centralized water impounding structures and elaborate canal networks, which spread over a large area. Sadly the demand for water for drinking and domestic purposes remains unmet because water is distributed very unevenly over huge areas, well beyond the canal networks and other distribution systems. This has created a paradox in which hundreds of parched villages have to be supplied with drinking water through water tankers in the dry season, while sugar plantations receive enough water to flood their fields throughout the year.

These conflicts between industrialized urban centres and rural communities over water allocation occur in the lower catchment area. But there is a major problem too in the upper reaches of the catchment where the degradation of land resources through deforestation has resulted in drought.



Gomukh has been working with village communities, state agencies and a vast network of like-minded civil society organisations to find not just technical but all embracing solutions to critical water problems in the Bhima basin. A decade of working in the valley has seen Gomukh evolve solutions in partnership with local stakeholders, for the development of water resources. Appropriate technologies help to set up and maintain structures that harness water. Equitable distribution of available water, improving the sustainability of agricultural practices, promotion of organic agriculture, and the empowerment of women through more than 80 self help groups, has lead to a drop of nearly one third of households living below the poverty line.

Gomukh has promoted the traditional practice of conserving 'sacred groves' in the valley to ensure groundwater recharge and biodiversity conservation. Local farmers have become organic agriculture entrepreneurs. Members of the network of women's self help groups have developed income generating eco-tourism, taking people from nearby Pune on day-trips through the valley to visit development projects, experience true village life, dine with local families and observe local customs, traditions and crafts. The recently established fruit and vegetable processing plant and cold storage and dairy at Chale village generates employment and income for the local inhabitants.

During the dry period of 2004 the green fields of the Kolwan valley stood out in sharp contrast to the other sub-catchments of the Bhima, which were dry and arid. In fact, during this year's drought, the people of Kolwan valley were able to provide water and fodder to large groups of migrating people and cattle.

The Kolwan valley initiative challenges the centralized decision-making and implementation of developmental projects, and provides a proven option to replicate elsewhere. It is now being implemented in 54 sub-watersheds of the Bhima.

### 2.6 Sand River, Savannahs of South Africa

From the Bhima Basin we travel to the low rainfall area of the Sand River Catchment in South Africa. The river has its source in a mountainous area, and rapidly descends into a semi-arid region. The major part of the catchment area is lowland savannah.

Available water resources in the catchment are insufficient to support the entire population and its current economic activities. Due to the colonial history of the country, where apartheid policies of ethnic segregation turned the area into 'homelands' for the black population, population densities are extremely high for a so-called 'rural' area. In addition, the conversion of the natural forest cover into plantations has damaged the riverine ecosystem. Consequently in times of drought river flows are reduced, wetlands dry up, and topsoil is lost.



In sharp contrast to all the other places visited during the trip, the government in this area has chosen to decentralize water management. People's participation, as well as sound environmental management, are the main pillars under this decentralized strategy. In fact, the National Water Policy and the National Water Act (1998) and Water Services Act (1997) include participatory water management marking a shift away from a solely top-down technical approach to water management to a more community-based one. The legal framework explicitly established the need for an ecological reserve and a minimum volume of water per capita as absolute priorities for water allocation.

According to the new laws all citizens have the right to be involved in the allocation and management of natural resources. However, after years of exclusion from democratic involvement people have little familiarity with this participatory process. In addition people lack a basic understanding of the ecosystem since they were forcefully displaced from their ancestral homes and prevented from earning a livelihood from their lands during the Apartheid regime. A lack of ecological understanding and wisdom cannot be filled by mere legislation.

Supported by the Departments of Water Affairs and Forestry (DWAF), and Agriculture (DALA), the Association for Water and Rural Development (AWARD) is co-ordinating the Save the Sand Project in the catchment. This project addresses the rehabilitation and sustainability of the Sand River, its tributaries and the catchment in an integrated and comprehensive manner. It recognizes the social dimension in the implementation of integrated river basin management.

AWARD, which has also been involved in developing national policies, has been focusing on negotiated approaches for the management of water resources at the catchment level. The organisation has evolved several ways of involving local inhabitants in negotiated approaches to IRBM. In order to involve people properly, awareness raising and skills development are central. AWARD has developed and is implementing the so-called spiral model: a method of reflexive learning that adapts to the political and environmental context as well as to the specific stakeholder group. The spiral model ensures continuation in learning and caters to different needs of different interest groups.

The project currently focuses on public participation where the water management cycle forms the basis for public involvement and negotiation. This method allows for a targeted and gradual development of participation, using different stakeholder groups according to their interests and competence.

Following its success, the Sand initiative has become the first pilot Catchment Management Agency in the country, setting an example to be copied in other South African catchments.

### 2.7 Deltaic plains of Khulna-Jessore: Bangladesh

From the grasslands of South Africa, we travel to the fertile, deltaic plains of Khulna-Jessore in Bangladesh.

The Khulna-Jessore area is a densely populated and highly dynamic deltaic ecosystem where agriculture, fisheries and shrimp farming from the basis of people's livelihoods.



The area is characterized by numerous small rivers and polders that were built in the 1960s to prevent the intrusion of saline water. As a result, the sediment carried by the tidal water could not enter the area within the polders and started clogging up the rivers, causing waterlogging through drainage congestion. This posed a serious threat to agriculture and consequently jeopardized the very basis of the local inhabitants livelihood.

In the Khulna-Jessore case, as in cases of most waterlogged areas, the conventional wisdom has been to go for construction of large scale 'regulators' to solve the problem. In theory, these regulators are to stop tidal waters from flowing into the `protected area' and prevent sediment deposits on the riverbeds there, so that the area remains free from waterlogging. In practice, however, due to poor maintenance these regulators often cease to function properly and create more serious drainage problems, causing prolonged flooding of agricultural lands well beyond the rainy season. In addition, the centralized management of these structures often causes conflict between the different stakeholders in the area.

The Centre for Environmental and Geographic Information Services (CEGIS), a public trust based in Dhaka, was requested by the Bangladesh Water Development Board (BWDB) and the Asian Development Bank (ADB) to carry out an Environmental Impact Assessment (EIA) of various options for regulators. CEGIS soon discovered that the local population of the floodplain

was wary of any option involving a conventional regulator. They expressed a desire, based on their and other coastal areas experiences, to avoid large scale, centrally-managed structures.

Together with CEGIS, they drew up their own management option, labelled as 'Tidal River Management' (TRM). TRM is based on traditional, small scale solutions to waterlogging, which makes use of the area's dynamic ecosystem. The technique allows for the drainage of rivers and a 'planned' deposition of sediments, through the creation of tidal basins at appropriate locations,

Initially, the Bank and the Water Development Board were reluctant to include TRM as an option in the Environment Impact Assessment (EIA), stating that EIA procedures do not include developing alternatives to proposed options. However, by presenting arguments based on local people's vision and knowledge of the ecosystem, CEGIS was able to convince the client that the TRM option needed to be included.

The EIA concluded that the TRM options compared favourably on almost all counts. Eventually, the TRM option was accepted for part of the river system, and has achieved positive results. In the Upper Bhadra region, there is no waterlogging now. While only 25,000 ha of land in the region could be brought under cultivation prior to the waterlogging, currently 67,000 ha of land is under cultivation. BWDB is now considering the replication of the TRM option in other coastal areas of Bangladesh.

The implementation and management of different aspects of the TRM-option requires intensive participation of the local stakeholders. Also, it is necessary to have a system in place that can negotiate agreements with landowners to allow their lands to be used as a tidal basin, and to assure maintenance and operation of the tidal system. The Kulna-Jessore case shows how adoption of appropriate technology, as per people's insight, coupled with government co-operation, can provide a sustainable solution to a problem in water resources management which can even have the potential of replication and up-scaling at the national level.

# 3 Conventional Approaches to Water Management

# 3 CONVENTIONAL APPROACHES TO WATER MANAGEMENT

As we have seen in section 1.2, there are two conventional approaches to River Basin Management: the Techno-economic Approach and the Integrated River Basin Management Approach.

## 3.1 The Techno-economic, 'Business as Usual' Approach to Water Management

The dominant approach to water resources development until the early 1970s could be described as the 'sectoral' and 'top-down' approach. Sometimes, it is also referred to as the 'techno-economic' approach, the term we like to use. The approach is still being followed in several countries.

The techno-economic approach is a centralized, supply-based approach, relying mainly on large dams and distribution systems. It deals with water resources development through hydro-engineering technology, combined with considerations of economic efficiency. Debates and discussions are usually restricted to engineers and economic policy makers. Project proposals for developing water resources are often based on statistical models and made to help fulfil politicians socio-economic and political aspirations.

The most outstanding characteristic of the techno-economic approach is its emphasis on the supply side. The methodology focuses on impounding or canalizing and directing the maximum volume of surface water run-off at the minimum possible cost. Water is allowed to rush off from the mountain slopes and collected in large reservoirs behind dams. From here a regulated flow through the left and right bank canals supplies water to urban areas, industrial users and for intensive irrigation for crops in limited areas between the canal and the natural river course. Generating hydropower is another major function of these so-called multi-purpose dams. This is also centralized and supply-oriented, resulting in an unequal distribution, especially in the Third World countries.



This techno-economic approach is dominant in countries like India, China, Brazil, Southeast Asia and most African countries.

> The hydropower potential of the Se San River has made it the target for external development interests in large-scale hydropower. After construction of the first dam began in 1993, various studies by the Swedish International Development Agency (SIDA) and the Asian Development Bank (ADB) refined the options down to five dams in the upper Se San River Basin. In Thailand, the state has conventionally sought solutions by increasing supply through infrastructure projects such as the Kok-Ing-Nan diversion. In India, most valleys and streams are characterised by large dam constructions, either in the direct vicinity or in the up-stream areas of major river basins. In all these cases, initial studies and designs consistently ignored local needs and interests.

Almost all these nations practice sectoral planning and development of water resources. Departments and ministries are charged with the responsibility of providing irrigation, domestic water supply to urban and rural areas, or generating hydropower. Each department usually prepares plans with a

single objective plus one or two additional functions thrown in for improving the financial viability of projects. Canals,disributaries, water supply pipelines and hydropower grids are centrally planned and operated through a rigid hierarchical command and control system.

However even though the system is centralized, there is a multiplicity of authorities and agencies, and a lack of adequate national laws to bring together policies or strategies for water resource development.

And though never formally accepted, aspects like the rehabilitation of displaced persons, environmental impacts and the ecosystem's requirements are generally treated as 'soft elements', not important enough for serious decision-making.

> After the construction of the Yali Falls Dam in the Se San River, the environmental effects noticed by the communities along the river included unusual flooding, fluctuations in river height, and declining fish populations. These communities have not been compensated for the large scale environmental, social and economic impacts that remain almost four years after the first turbines were commissioned and a little over ten years since construction began.

The approach has been quite suitable to highly urbanized, industrialized nations, where demands for water and energy are centralized and all users live in and around urban metropolitan areas such as in North America and Europe. Equally an analysis of the planning, implementation and operation of this conventional techno-economic, project-based approach shows it is unsuitable for precisely those countries and areas where it is most used. These are developing countries and countries in transition, where thousands of villages are dispersed over large areas and small landholders with less than one to two hectares of land, each often living in mountainous areas or degraded forest lands. Proponents of the techno-economic approach such as water resources engineers, civil engineers, politicians, affluent farmers and industrialists have, unfortunately, very limited information on the importance of ecosystems, the goods and services provided by them and their interconnections with the rural population. Absence of information and unwillingness to be inclusive leads to highly biased and dogmatic views.



The transmission and distribution costs managed in a techno-economic way become high. Management and establishment costs are enormous. These large infrastructures end up catering to urban demands while leaving 50 to 70 % of rural communities outside the development – either because they are out of the reach of the canal network or because it costs too much to transport water over such large distances and difficult terrain.

**Short-comings of the Techno-economic Approach**

Aside from geographic considerations of suitability, the approach has several flaws which emerge very clearly when one examines its structure and functioning.

### Negative Ecological Impact

Water resource development, unlike other industries or service sectors, is embedded in a dynamic river basin system usually spread over millions of hectares of land. The basin has its characteristic sub-ecosystems, subsoil geology, geo-tectonic properties, input residues in the surface and underground water flows from industrial and civil pollutants. This complex structure forms the physical base of the development. A sound understanding of the physical system, and a respect for its integrity should underpin the development. Yet such understanding is rarely reflected in the planning and implementation. These generally focus on the average annual yield, and the average rate of siltation, the erosion and transportation of silt to the bottom of the reservoir each year.

Other characteristics of the basin, such as groundwater aquifers, natural wetlands and fisheries resources, are usually ignored.

> In Bangladesh consultants working for the Asian Development Bank (ADB) had suggested construction of a large regulator regulating in and outflow of water in the area as a solution to the problem of waterlogging. However, in the long run the regulator option would adversely affect the biophysical environment and consequently have negative impacts on the production of fish and paddy as well as other socio-economic factors. People of the area believed that the proposed regulator would aggravate the problem in course time due to the fact of absence of proper maintenance. They believed large volumes of sediment would deposit in its immediate southern vicinity, thereby causing waterlogging in vast areas to the North.

Since such ecological considerations have largely been excluded from management planning and implementation most river ecosystems and valleys have been severely damaged by human interventions. River basins have been substantially destroyed by the impacts of dams, barrages and huge canal networks. This seriously hampers the ability of river basins to provide food, shelter and security to resident populations.



### Unjust Social Impacts

Different communities have different needs that must be recognized in planning and implementation. Unfortunately the techno-economic approach completely fails to recognize the needs and knowledge of these communities or their role in decision-making and management.

Due to their sheer physical size and scope, large infrastructure projects take up huge areas of land. In such places, land-use and livelihoods naturally have to undergo a transformation in order to make room for the project. The disregard for resident communities has created an entire social class of environmental refugees who have been 'dam-displaced' against their will. Damage to their rights, entitlements, and security of livelihood remain uncompensated. Bureaucratic delays and corruption further add to social trauma. The displaced communities are relocated arbitrarily, with no consideration given to the attitudes of the host communities. In many cases the resettled households are driven off as unwanted aliens, and they end up going back to the lands close to those submerged by the reservoirs.

The new ecological context compared to the original one, and the type of livelihood creating activities the displaced practiced, is also not taken into consideration. The techno-economic approach is that it disrupts the lifestyle of upstream and downstream populations. In the case of Se San, the dam constructed in upstream Vietnam, makes it impossible for the downstream users to continue traditional flood-plain farming, fisheries or even transport.

Unfortunately many of these matters continue not to be taken seriously. They are often considered to be a 'nuisance' or 'impediments' to the progress of projects of essentially technological and alleged economic importance. Institutions capable of carrying out research, conducting negotiations with stakeholders, developing systems for transmitting and publicizing information, such as translating facts into relevant languages or managing the media, are poorly equipped or conspicuously absent.

Thus the rights and interests of many of the people who will use the projects are ignored during the planning, implementation and operation phases, even though they must pay by giving up all their possessions.

In addition a large proportion of the population is completely outside the reach of the distribution system. The considerable investment in large scale infrastructure have lead to a general food sufficiency and reasonably adequate supplies of domestic water in urban areas. However the drinking water and domestic needs of most people and the water needs of large areas of agriculture fed by rain remain substantially unfulfilled.



> In the Bhima Basin 51% lies outside of all government water supply schemes; Of the remaining 49%, government canals irrigate barely 4.7% and another 15% is irrigated through private sources like lifts, pumps and wells. Water intensive crops like sugar-cane are planted on 3% of the cultivated area yet consume 22% of the total water available for irrigation. The urban population of about 42% receives adequate and assured water supply ranging between 70 and 265 litres per capita per day.

Continuing 'business as usual' the needs of vast areas and populations are likely to remain unmet. The International Fund for Agricultural Development (IFAD)[3], for example, in 2001 estimates that poverty will continue to be predominantly rural (over 60%) in 2025, and will be concentrated in difficult areas such as the remote mountainous province of La Union in Peru. The distance from the centres of demand causes a general lack in public services, including, for example, refinements for irrigation infrastructure, which hampers the distribution of water.

### Economic and Financial Shortfalls

The financial performance of such projects does not stand scrutiny. The projects are expensive to construct and maintain, and the people who make use of the project at the end bear the brunt of the expense. Water must then be subsidized, especially for agricultural use, in order to make it affordable.

The water charges and hydropower rates are nearly always far less than the marginal costs of service delivery. This is mainly because they are not revised for several years in spite of high costs and price inflation.

[3] Source:Rural Poverty Report 2001, IFAD, 2001. See also http://www.ifad.org/poverty/

Revenues collected rarely cover the operation and maintenance charges of the projects. The obvious consequence is that the systems deteriorate with irrigation efficiencies of 40% or less and transmission and distribution losses exceeding 35%. These are widespread and therefore go unnoticed. Revenue loss is often due to systemic corruption, which has its roots in the links between politicians and bureaucracy. This means the consumer or irrigator pays the full price, while a good part of it goes into private pockets.

The economics therefore of this 'business as usual' are 'holed' in three places: corruption and inefficiencies during project construction; leakages during service delivery, and leakages during revenue collection.

**Conclusion: Weighing up the Techno-economic Approach**

In the face of such tremendous flaws, why did this sectoral, techno-economic approach become 'mainstream'?

Until the early 1970s this approach worked very well in developing economies, mainly because sustainability was not an important issue. Populations who suffered were not emancipated enough to demand their rights. Neither were civil society organisations or politicians sufficiently aware or active. They did not galvanize movements for asserting community rights in the development and management of natural resources, nor in the need to use the available natural resources in an environmentally sustainable way.

The techno-economic approach reflected the level of awareness then existing about water resources. There was also relatively less pressure on natural resources in general from the human population, while the scale of human intervention was smaller and less pervasive.



> In India, the priority in the 1960s and 70s was to ensre food security for the growing population. this fuelled the Green Revolution, which was characterized by indiscriminate use of pesticides, fertilisers and irrigation. In that area, mega dams indeed delivered the goods and were considered to be the "tempels of modern India". On the longer term however, we can now see the destructive impacts of the large scale chemical pollution and water extraction.

The approach partly satisfied the perceived needs, though large areas still remained deprived. In retrospect one cannot blame the technocrats of those days, as society itself expected them to find technical fixes for all needs, no matter what the environmental or externalized social costs of such develoment.

However today it is deplorable that in most countries, an ecologically non-sustainable and socially inequitable legacy of the mid-twentieth century continues to persist as the 'mainstream' approach to water resource development. Water management based on large projects and elaborate distribution systems is no longer an appropriate answer to the needs and requirements of water systems. New insights and contemporary social and ecological problems urgently require alternative approaches to be included within water management techniques.

## 3.2 The Integrated River Basin Management Approach

It is in this context that other systems of water management are envisaged. In the process of conceptualizing alternatives, it is clear that large water management projects do and will continue to operate, especially in places where they are well suited, cities and metropolitan areas, for example. However, the areas out of reach of these projects, close to 50% of the population, will continue to experience a lack of water, food, economic well-being and development. What is sought in any new approach, therefore, is not a complete abandonment of the old system, but rather, the inclusion of new systems in the process of management that set out to avoid to increase the vulnerability of poor people and the environment.

Integrated River Basin Management (IRBM) took root after the international conference at Mar del Plata in 1977. The basis of this second conventional approach was subsequently embodied in literature coming out of the three World Water Conferences at Marrakech (1997), The Hague (2000) and Kyoto-Shiga (2003), as well as several other events like the UNCED 1992, WSSD (2002), the Bonn Freshwater Conference (2001) and the annual Stockholm Water Weeks.

**Origin of the IRBM concept**

The need to manage fresh water in a holistic manner has been recognized for several decades, but the concept has undergone a considerable evolution.



Ecologists see integration as amalgamating all the sub-ecosystems, linked inalienably along a river basin, which function in an independent manner within the geographical and physical parameters. Alternatively water resource engineers and government departments think of integration in terms of sectors, users or departments, such as, irrigation, hydropower, water supply and sanitation, urban development, inland fisheries. This is mainly for administrative convenience and the co-ordination of duties and responsibilities. They believe the co-ordinated planning and development of all sectors through inter-departmental discussion and decision-making is the right approach.

An important step towards integration was taken at the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. Its program of action, the so-called Agenda 21[4], strongly advocates an integrated approach to development, management and use of water resources. It rejected the sectoral approach stating that: 'the fragmentation of responsibilities of water resources development among sectoral agencies is proving to be an ever greater impediment to promoting integrated water management than had been earlier anticipated'. It recommended all governments integrate all sectoral plans and programmes related to water within the framework of national economic and social policy. It was a matter of paramount importance for actions in the 1990s and beyond.

Agenda 21 proposes that water management should cater for multiple users and objectives. This implies integrating the needs for drinking and domestic

[4] See Chapter 18, on the protection of the quality and supply of fresh water resources

supply and sanitation with the requirements of agriculture, fisheries, industrial and urban development, hydropower generation, water transport and recreation. The recommended changes were in sharp contrast to the centralized and bureaucratic framework previously adopted. They demand a transformation in the administration of water resources, including creating platforms for stakeholder dialogue, the inclusion of civil society and local community organisations in decision-making cells and for setting up a mechanism for publicly resolving conflicts and redressing grievances. These were to be brought together under a comprehensive legal framework to support the integration of various previously independent sectors.

The need for sustainable water management has been reaffirmed in international conventions. Most recently the UN's Millennium Development Goal (MDG) number 7 identifies sustainable access to safe drinking water as one of the goals under the overall MDG 7 to 'Ensure environmental sustainability' by 2015. By including drinking water under the environmental MDG, the UN recognizes the interdependence of natural systems and basic services.

Heightened interest in sustainable water management offers a chance to begin thinking of new ways of managing river basins. International aid organisations are reconsidering water policies and putting greater emphasis on development principles that reflect environmental, social, and cultural values.

Importantly, these visions recognize the underlying principle of respect for the integrity of natural ecosystems. Maintaining adequate ecological flows and fresh water quality was paramount. This adhered to the idea that there is no appreciable difference between the interests of human health and sanitation and the maintenance of natural ecological integrity. The protection of natural and artificial water bodies, as a holistic life support system, is expected to form the basis for a system of sustainable water management.



**IRBM in practice**

Integration, however, is obstructed by political interests, inter-departmental bottlenecks, bureaucratic processes and corruption. These block the change in attitude required to achieve ecological sustainability and social justice. Most political positions, for example, are rigidly biased towards a continuation of the prevalent techno-economic approach.

Despite this there are several countries that have started moving along this path towards Integrated Water Resource Management (IWRM) and, on an operational level, IRBM. For once there is sufficient political will, integration usually starts snowballing whether initiated by the government or by civil society.

Subsequently different interest groups realize the tremendous mutual benefits to be derived from integration. Different stakeholders learn more with each round of negotiations, discussions and debates. Deep-rooted issues can be addressed as these procedures become routine. These can include: the equitable sharing of water; forgoing monopoly position or appropriation rights, surplus or deficits in water availability, and anticipating and planning for droughts and floods.

## Defining IRBM

As a result of the increasing popularity of the integrated approach, a myriad of IRBM definitions has evolved. A single definition is difficult to pinpoint, but all suggests that the driving force behind the emergence of an alternative strategy for resource development is a concern for sustainability. Linking the health of ecosystems with human well-being is its primary concern.

To guide the analysis and recommendations put forth in this document, we will use the definition used by used by South Africa as a basis for its national water policies and legal framework:

*IRBM is 'Simultaneously a philosophy, a process and an implementation strategy to achieve a sustainable balance between the utilization and protection of all environmental resources in a catchment, and to grow a sustainable society through stakeholder, community and government partnerships in a management process'.*[5]

It is important to make a distinction between IRBM and IWRM. IWRM covers a larger area including the integrated management of all water resources in a country or a region. This implies that there should be:

- Links between general land and forest management,
- A consistent and common structure for laws, policies and procedures, in all basins within a country;
- An institutional framework consisting of enforcement agencies, which cut across ministries, agencies and river basins;
- Authorities, arbitration cells and tribunals for resolving disputes within and between river basins;
- A state plan for allocating resources between administrative units and/or sub-basins, and academic and research institutions.



Definitions of IRBM are supported by a series of common guiding principles including:

A. Water development must adhere to ecological principles, assessing and integrating the links between processes and activities that cause biopysical and ecological changes in catchments;
B. No management approach is sustainable without active participation in decision-making from all users, in order to achieve outcomes that are understandable and acceptable to all stakeholders and which allow for the sustained use and protection of water resources;

[5] Adapted from Pollard,S 'Operationalising the New Water Act: Contributions from the Save the Sand Project - an integrated catchment management initiative', in Physics and Chemistry of the Earth 27 (2002),941 - 948 Compare:
*World Wildlife Fund:* Integrated river basin management (IRBM) is the process of coordinating conservation, management and development of water, land and related resources across sectors within a given river basin, in order to maximize the economic and social benefits derived from water resources in an equitable manner while preserving and, where necessary, restoring freshwater ecosystems.
(http://www.panda.org/about_wwf/what_we_do_/freshwater/what_we_do/river_basins/irbm.cfm
***Global Water Partnership*** (GWP): IWRM is a process, which promotes the co-ordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner withhout compromising the sustainability of vital ecosytems. (Integrated Water Resources Management, GWP Technical Advisory Committee Background Papers, No. 4,2000,http://www.gwpforum.org/gwp/library/TACN04.PDF)

C. The genuine participation of women is essential if basin management is to be sustainable and equitable. This participation, both formal and informal, is required during the management, planning, conservation and use of water resources.

It is important therefore to examine how the IRBM approach functioned when it first started to gain popularity. And why, despite all the conceptual discussion about integration, economic growth and technology continue to be dominating factor in management decisions.

**Inadequacies of Conventional IRBM**

River Basin Organisations (RBO) which act as the co-ordinating agencies of IRBM, tend to be monopolized by government departments with practically no participation of civil society. Though in the later stages of the process, there may be 'consultation' with community-based organisations and NGOs, that in itself cannot be called an open and transparent negotiating platform. Thus, though it claims to be an integrated approach, more often than not, the conventional IRBM approach ends up by being a co-ordinating platform for the technocratic representatives where apex level consultation does not translate into stakeholder participation.

IRBM continues to be characterised by a centralized approach based on hydrological models and large scale interventions in river systems. Initial design parameters are set by hydrological engineers and are aimed at satisfying the demands for technological and economic well-being. Local participation both in cities and rural areas, remains limited to consultation in the later phases of fine tuning policy and project design.



Conventional IRBM decision-making continues to deny large parts of a river basin's population the opportunity to present and negotiate alternative management options. Communities, especially the poorer ones, are still looked upon as problems to be tackled, rather than key actors in finding solutions.

The focus continues to be on large scale interventions in the river basin. This approach remains 'supply-based' and water management continues to be a costly affair requiring huge amounts of investment exceeding government revenues during planning, implementation and maintenance. This in turn deprives the financially weaker sections of society of the benefits of the resource. They simply cannot afford it.

> In Cochabamba, Bolivia, the fast expanding urban areas are demanding increasingly more water resources. A series of water conflicts therefore has arisen in its Central Valley between different stakeholders, mainly the traditional irrigation organisations and the state and private drinking water companies. On one side, state agencies, supported by the legal and institutional establishment, were forced by the growing population and urbanization of rural areas to take more of the rural water resources. By failing to look for a negotiated option, their top-down attempts were confronted by local organisations, which defended their customary user rights as the main pillar of their livelihoods and as essential social and cultural values.

Although the final design and implementation of the project may integrate many previously independent sectors on a macro-level, it still runs contrary to objectives of sustainable development and social equity. Water management executed through conventional IRBM continues to create huge benefits for some and severe deprivation for others.

**Conclusion: Weighing up Conventional IRBM**

Centralized 'integrated' projects result in benefits for certain urban and rural communities. It has the potential to reach to more stakeholders than the techno-economic approach. At some places they have increased food production and water availability. Initially the IRBM approach was designed as a step towards an holistic approach to water resource development, as practiced today, taking into consideration the ecological integrity and the socio-economic contexts of the systems in which it intervenes. However experience shows that integration rarely reaches far down the project and certainly never reaches the sub-basin or micro-catchment level. The direct, active and continued involvement of large proportions of the population is still not regarded as essential.

# 4 Negotiated Approach to Water Management

# 4 NEGOTIATED APPROACH TO WATER MANAGEMENT

As seen in the previous chapter, though not necessarily intending to do so, conventional approaches continue to use top-down planning. Rarely are the interests and capacities of immediate stakeholders, those living in the sub-basin or micro-catchment, taken into account. In such approaches, the creation of a master plan is the starting point for management interventions. A master plan formulated by bottom-up negotiation on the other hand, is the culmination of a much more inclusive, just and altogether more thorough, process.

Originally IRBM recognized the importance of stakeholders participation and negotiation as the only way of ensuring sustainability. Despite this recognition, IRBM today, only includes negotiation on policies at the very top level. Participation by grassroots level communities is usually absent.

The 'Negotiated Approach to IRBM', outlined here, is a re-affirmation of the original principles of IRBM. But significantly it also brings the issues of sustainability, social equity and the thinking behind systems to the fore-ground and reiterates a commitment to use negotiation to fulfil these goals. Such a commitment has been sidelined in the conventional IRBM thinking.

The negotiated approach builds on the premise that there are already many local examples and cases existing today, which have the potential to solve water problems, not just at the local community level, but also at the larger level of the river basin. International agencies may pay increasing attention to them but they are very often condescendingly termed 'minor alternatives' having only a marginal and local significance.



The negotiated approach to IRBM constitutes a further step towards the realization of the goal of sustainable development of water resources. The term 'sustainable' implies that the approach seeks to unify the interests of ecological well-being with the long term interests of the human populations who depend on these ecosystems. The demands of social equity and justice, both integral parts of the agenda of sustainability, require an approach that has a genuine concern for social welfare. What is now required is to transform current practices in IRBM into an approach from the bottom up, involving communities at every stage, building negotiation and dialogue that allow for decisions through consensus.

**Differences between Conventional Approaches and Negotiated IRBM**

The bottom-up negotiated approach is often criticized for being too time consuming. Yet the techno-economic, large dam approach is notorious for running over time. Usually an important reason behind such delays is the massive opposition to these projects at every stage. It is argued, therefore, that if efforts were made for thorough, negotiated planning time would be gained. This would avoid delays and ensure the participation of all concerned.

In the Bhima case, the combination of the construction and the negotiation phases in the Kolwan valley has in the end been less time-consuming. The main reason is that in most infrastructure development projects, an enormous amount of time is spent after the construction fulfilling all the social requirements connected to the project because there is not the experience with these processes. This often leads to a large amount of protests, which significantly delay these processes. By starting negotiations from the beginning, even including it in the planning, these delays can easily be avoided.

The planning process too is altogether different between such top-down and bottom-up approaches. In the former, the level of water demand, upon which the project will be calculated, is assessed in a reductionist manner. A certain accepted minimum is agreed upon for instance, in India it was agreed that 125 litres per day per capita for urban areas and between 70-100 litres per day per capita for rural areas is the minimum requirement. The total demand is then calculated by extrapolating this figure to the whole population.

Conversely ascertaining demand by negotiation from the bottom up is a much more holistic and practical process. It takes into account factors such as the distance of the final user from the source, the cost of transportation and unique ecological conditions that may influence availability. It allows for the active inclusion of groups that are often marginalised from decision-making, such as landless people and women.

In the Ocoña basin in Peru the main activity is farming. During negotiations the NGO AEDES helps the different population groups such as the farmers and women to organise themselves and to negotiate their basic needs. Different levels of organisation have been established, such as the District Settlement Tables (Mesas de Consertación), and the Associations of Organic Crop Growers and of Medicinal Plant Growers at the provincial level. The demand for water by the different groups and organisations is determined through negotiations.



Experience has repeatedly shown that large scale projects, planned in a top-down way, involve a huge financial cost. Such a large scale system tends to supply services, which, by their very nature can only be appropriated by the affluent, since market forces influence their availability. Negotiated IRBM is, however, strictly demand-driven. It gives priority to basic needs.

The first important consideration in a revised IRBM approach is to establish management and decision-making powers at an appropriate level allowing for the inclusion of the interests of the immediate stakeholders regarding the use and conservation of a natural resource. When the social and ecological aspects are appreciated and integrated into water planning, it becomes clear that solutions cannot be found at an abstract global or international level and that realistic actions are often only possible at the level of the sub-basin or micro-catchment.

The Sand River case in South Africa showed that negotiation at national, provincial and catchment levels encompass similar principles for involving civil society, but that the practical aspects, mechanism and subjects of negotiation vary markedly. To be able to build a broad framework for negotiation, the project has concentrated on negotiations at the catchment level first, allowing for both the knowledge of river basin management and the negotiation capacity of the different groups of stakeholders to be built up incrementally.

## 4.1 Local Action as a Requisite for the Negotiated Approach

Local communities have sought their own solutions to water management problems and needs. Many of their approaches intuitively adopt an integrated approach to water, reflecting a daily reality, in which the use for water and other natural resources linked to the basin cannot be put into different compartments. Even though the operation is often small, it indicates an awareness of the interactions between human and natural systems on a lower order basin or catchment.

In fact, local initiatives do not restrict themselves to a small section of a larger basin or a 'micro-watershed'. This document shows several examples of local strategies that reach out to basin and national levels. In all these cases, scaling up the approach is interwoven with work on a local level, allowing the local vision to remain intact and be integrated in basin policies.

Communities do not already have all the answers and resources for achieving the entire millennium objectives (MDGs) by 2015. Neither can all water requirements for growing food for the large urban population areas be met through a negotiated approach. However the serious flaws of today's river basin management approaches can be overcome effectively by building on local actors' actions and vision, so supporting local people in their search for ways of distributing water equitably between people and nature, and using and disposing it efficiently and wisely.

Many of their approaches intuitively adopt an integrated approach to water, reflecting their daily reality, in which the use of water and other natural resources linked to the basin is not compartmentalized. While academic researchers have to make a conscious effort to think in an interdisciplinary manner, holistic thinking often comes naturally to local communities. Experience shows that local negotiations do not distinguish between 'water for food', 'water for drinking', 'water for nature', or 'water for industry'.



> In Thailand state authorities have sought solutions for water conflicts by increasing supply through infrastructure projects. The community culture approach to water management offers the muang faai alternative, the traditional weir and channel systems of northern Thailand. This approach demonstrates the effectiveness and complex inter-relations between ecology, culture and the fair allocation of such systems, because the collective contribution of labour was seen as a basis for community solidarity.

The approach calls for the implementation of the subsidiarity principle. This principle holds that any decision is best taken and implemented at the lowest possible level. Thus, local, micro-watershed levels should be a priority for decision-making. Only where absolutely necessary should decisions be taken at higher and higher administrative levels. This allows local actors to develop context-specific basin management strategies and to influence regional and national decisions, with the ultimate end of developing a bottom-up process of policy development and management.

Due to the proximity of the resource, management actually takes place on the most appropriate level, the level of the resource itself. The scale of operation is often small but it has an awareness of the links between human and natural systems on a lower order basin or catchment. Local interests and the integrity of the ecosystem are not treated as mutually exclusive.

In Bangladesh the conventional regulator option could result in newer water logging problems at different places in the ecosystem. The Tidal River Management option offers a solution that builds on ecosystem characteristics and benefits the local interests of the farmers and the fishermen. It allows for more transparent and inclusive decision-making and management, important criteria for achieving a sustainable use of the resource.

Local action, by definition is limited in scale; therefore local action, which may be beneficial at one place, may be counter productive for another place, or detrimental for the system as a whole, for example by shifting cultivation and causing ground water abstraction. But when local action is coupled with fair and transparent negotiations it creates a powerful synergy.

In Thailand, increasing demand for water initiated interest in the construction of a storage reservoir, among villages in Nam Rim Watershed. A key issue has been where to build the reservoir. The Royal Irrigation Department designed a plan for a dam, which would benefit villages in one part of the watershed with the option to intensify irrigation. However, 80 families of the upstream Ban Huak village would have their fields flooded, and another number of families would have their homesteads flooded by such a reservoir. After some negotiation, the District Officer came with an alternative dam positioned above Ban Huak, irrigating a double amount of land and negatively affecting only three families. The villagers of Ban Huak suggested two options:



1) If the dam would be built as suggested in the first option, those who would benefit from it should deposit sufficient money in the bank to compensate up to 80 families 70,000 baht per family in case all would be impacted. If some were not impacted, the money would be returned. If more than 80 were impacted, Ban Huak agreed to bear the cost;

2) If the dam is built above Ban Huak, those benefiting should help clear 40 rai (1 Rai = 1600 $m^2$) of land in compensation for the 30 rai belonging to the three affected families.

The second option was agreed to. This example suggests that local communities do not resist state assistance or infrastructure projects. Further, it shows that negotiation between beneficiaries and those affected by a project can occur based on social relations between the communities.

Today water management tends to emphasize the weakness of local action, but denies its strength. By recognizing the potential of local actions and vision and allowing more responsive policies, central decision-making can become more sustainable and effective.

**Defining Local Action**

It is essential in the debate on policies to analyse how river basin management strategies based locally compare with the centralized systems and master plans that currently dominate international agencies and state authorities.

Meanwhile, it is difficult to distinguish between action at a local level and others. Local, national and global are terms that primarily relate to the

proximity of the decision-maker to the action. In order to compare the merits of locally based approaches, the following characterization of local action has been developed for the current project:

- In the context of river basin management, 'local' refers to sub-basins, districts and villages. Local actions extend along the flows and drainage lines of river basins from the point of origin up to the eventual discharge through the estuaries into the sea.
- These areas are characterized by a mix of attributes, including, for example, rural-urban, industry-agriculture, poor-rich, forest-agricultural-wasteland, and riverine and non-riverine areas. Local action takes place within the larger context of policy and management, which can either support or undermine efforts for sustainable local water management.
- Local action includes all efforts taken by communities, civil society organisations, water users associations, and municipalities, to protect, conserve, utilize, recycle or regenerate surface and ground water and that which is suspended as soil moisture, for supporting their own livelihoods and all other life forms within their environment.
- Local action implies the creation and establishment of institutions involved in co-operative or community harvesting techniques, collecting maintenance and repair costs, and developing procedures for collective decision-making to satisfy both the need for food and environmental security.

Local action may take a more radical form if communities feel that their ethics regarding water use are being threatened. For example in local people's reaction to the involuntary displacement of entire communities due to large scale interventions in river systems. These actions can stop dam projects in their tracks, changed the allocation of funds, and even caused shifts in national and water management policies.



**Engaging Local Action**

Civil society organisations have spearheaded the assimilation of local action into mainstream initiatives. These organisations have combined their skills with international support systems with their strong links with local communities. They have used this position to start to inform water management experts, governments and policy makers of the innovative strategies local communities have been developing to manage their resources on a small scale.

CSOs recognize the potential of these innovations and now envisage a process of 'scaling up'. This could ultimately lead to a completely transformed system of resource use and development, in which decentralized management fosters the health of ecosystems and equity in distributing resources.

Yet many planners and policy makers consider local communities' management systems incapable of being scaled up. Therefore it is necessary to showcase initiatives that demonstrate the key elements of local initiatives and show concrete, viable actions. These can demonstrate how they can generate mutual benefits on the level of basin or national water management. Recognizing the potential of local resources management to meet the challenges of integrated water management allows for local knowledge to be incorporated.

## 4.2 Negotiation

The nature and role of negotiation in natural resource management is covered by a huge amount of literature. Important here is that negotiation means 'to confer with another or others in order to come to terms or reach an agreement'.

The objective of negotiation is to involve all stakeholders in an active, participatory process in order to optimize solutions for distributional equity.

Negotiation occurs at and between the local, regional, national, and international government. But negotiation cannot afford to ignore the importance of communication and decisions taken through informal structures. Most forums where negotiation currently occurs overlook the fact that water use is governed by a number of social networks. People are always members of multiple social institutions and their access to resources is influenced not just by formal governmental policies. Equally important is their position in a wide range of informal networks not necessarily linked to the official negotiating platforms. In Bolivia, these are the irrigation committees that together form ASIRITIC, and in Thailand it is the social network that evolved around the muang faai.

> The structure of the SSPN in Cambodia provides important lessons in network building. An important feature of the network is that its formation has been an organic process, evolving out of the local institutional and cultural context in response to community needs and capacity. The SSPN's local structure has evolved out of the broad-based participation of key village representatives, and local government officials, as well as guidance from a strong locally based Se San Steering Committee. The participation of local government officials is an important element in creating a trusted and recognized structure from the perspective of the district and provincial government. All the members of the Se San Steering Committee are local indigenous people with long experience of working in provincial government agencies, local NGOs and other community-based groups in the Province. In this case formal and informal institutions come together organically.



Negotiation starts from the premise that management policies should build on existing local practices of integrated land and water use. Knowledge of such local practices is used as a starting point because it is recognized that these initiatives have the potential to meet and resolve the challenges posed by integrated resource management. The NCSCC started its research on existing local practices, while the Centro A.G.U.A. began analysing the history of irrigation in the area. This was a start to understanding the increasing complexity of the land use and water access dynamics resulting from processes such as urbanization.

### Negotiation and Participation

Participation is not the same as negotiation. What distinguishes negotiation from participation is the fact that in the former, the stakeholders participate in an active process, identifying problems, delineating their positions, interests and suggested solutions, and coming to some sort of agreement with their negotiating counterparts for the best possible solution. Conversely participation forms part of the most conventional techno-economic approaches. Stakeholders will participate in development such as by airing grievances or sharing opinions. When local communities sign petitions to the

government to halt the progress of dam building or other large scale interventions, this may also be termed participation. On the other hand when the same communities take part in discussions with members of the government and actually have a part to play in the initial design and as well as the final decision-making, then this is negotiation. Participation therefore does not imply the same dynamic and active process that negotiation does.

It is vital to understand that the process of negotiation in general, and specifically negotiation as it is meant to be practiced in IRBM, involves the participation of all stakeholders.

> In Bolivia the two local water organisations ASIRITIC and ASOCATI were relatively weak negotiators. They needed not only information and support for the discussions but also institutional support for building their capacity. They also needed some facilities to get the chance to bargain more on an equal footing with other powerful actors. Centro A.G.U.A. has been supporting both sectors, providing information and facilities, strengthening their participation in negotiations, and sharing common concerns in support of further agreements. This shows that negotiation is more than 'sitting around a table' and suddenly becoming aware of a solution. It involves an active struggle, maybe even a conflict, between the stakeholders, before the best possible solution is reached. The irrigators in Tiquipaya do not have an effective participation in the formal organisational structure because of what has been described above, but also because of the difficult relationships between the main stakeholders. In Thailand the upper watershed users formed the Nam Rim Watershed Network only after serious conflicts over water and land resources.

**Negotiation and Gender Equality**



Access to a resource such as water is dependent on a variety of social structures, both formal governmental provisions as well as informal community arrangements. Informal arrangements are ones where women tend to exert control. In Asia and Africa, many researchers have suggested that it is women who play a crucial role in water management, a fact often neglected by irrigation and water supply departments. Women's roles in informal arrangements offer a promising start for identifying realistic ways in which water users organisations can become more equitable and effective regarding gender. In the context of the Negotiated approach to IRBM, a truly representative sample of stakeholders must be present at negotiating platforms since distributional equity is such a major concern. Women must therefore play a role in negotiations and decision-making.

> The SSPN in Cambodia has strong participation and representation from women. Two of the Se San Committee members are women with professional experience of gender issues in the province. This has helped the project to make sure that gender issues and representational balance are addressed.

**Financing Water Management and Development**

Financing water management and development is a huge task. The centralized and techno-economic approach to management is capital-intensive, placing significant strain on a country's economy. As a result financing a project is often off-loaded onto local bodies, many of which are simply unable to meet this challenge.

As a general economic principle all users have to share the costs of making water available and providing it at the site or location of use. It is necessary to clarify that water charges or prices must reflect the full cost of providing water in the long run, constituting the full cost of augmentation, storage, protection, conservation, purification, transportation and distribution, as well as the safe and sustainable disposal of treated wastewater. Local people's representatives would have to have the power to regulate water use in times of shortage by assigning special scarcity prices.

The specific prices would therefore reflect the cost of the service and not the cost of water as a commodity. This means that the cost of water should reflect only its value gained through such processes as impounding, treatment and purification through public or private investments. The water itself is a free, public and social good. Unfortunately in the Third World, commercial loans and private sector investment are both in decline, while the demand for water is rising. Based on current estimates of the rate of population growth, the UN estimates that by 2015, 1.5 billion more people will be in need of drinking water and 2 billion will require sanitation. Meeting these demands will require a gigantic effort at all levels of governance. Specifically, the Report of the World Panel on Financing Water Infrastructure (2003)[6] recommends that the managerial capacity, especially at the operational level, is a factor of critical importance, and every possible effort should be made towards increasing it. Meanwhile it recognizes that corruption is a major cause of revenue losses.



A comprehensive assessment of options starting from the bottom up must, therefore, form a mandatory and integral part of any water resource development project, and only those options with the lowest marginal social costs should be selected. Transparency, adequate independent monitoring by water-users associations and NGOs need to be supported.

**The Benefits of Negotiating**

Ideally the range of stakeholder rights and interests in negotiations is diverse. With reference to natural resource management this means that human interests and the integrity of the ecosystem are equal. These two sets alone provide a hugely diverse range of interests to be catered to. So long as people with diverse interests are involved in looking for the best solutions, it is likely that a conflict of interests and positions will arise. Conflict, or the threat of conflict, is thus a precipitating factor for negotiations to occur. In many cases, conflict between stakeholder interests may actually be the catalyst required to start the negotiations. The satisfactory resolution of this conflict to all involved is the central concern of a negotiating platform. Where conflict between the stakeholders has not occurred, negotiation becomes a way to prevent it.

[6] Winnepenny, J. *Financing water for all: report of the World Panel on Financing Water Infrastructure*, World Water Council, Marseille, France, 2003.
See also:http://www.worldwatercouncil.org/download/CamdessusReport.pdf

Negotiation can also crystallize interests and identities. Often a particular stakeholder will not begin negotiations with clearly defined interests. The process itself very often leads the stakeholder to a consolidated position. For marginal groups, especially, such a consolidation can be a highly emotional experience.

Lastly, negotiations imply a fully transparent disclosure of information. If one assumes that all stakeholders never know enough to act in the best manner, then the negotiation process itself can be a way of accessing information. It is about people coming together, with opinions, supported by facts.

## 4.3 Negotiation and Appropriate Technologies

Different techniques have intrinsic biases embedded in them. In this respect, the negotiated approach opposes the notion that management techniques are neutral in value. In Bangladesh, the option of the tidal basin as opposed to the technique of the regulator is a locally driven technology, negotiated by the population themselves. In India various schemes for water storages and soil conservation have been implemented and proven successful.

**Inappropriate technology: The Yali Falls Dam**

The Se San case is reflected by a clear rejection of a specific and inappropriate technology. The Yali high dam in Vietnam is seen as undesirable since it violently jeopardizes the sustainability or even survival of downstream agriculture and populations due to prolonged and untimely inundations and floods. The efforts towards identifying appropriate techniques are thus restricted to either coping mechanisms, or organised actions for mitigating disasters. In addition, the people affected by the Yali dam have started to discuss alternatives to the present situation. Accepting the existence of the dam, they are now looking at appropriate technology from the perspective of mitigation of existing impacts, considering a more appropriate way of operating the structure, which should at least allow for the 'mimicking' of the river.



Technology is not 'result-neutral' either. When different techniques are used for achieving similar objectives, the socio-economic and ecological impact is substantially different in each case. The scale of operation, the levels of sophistication, the degree of capital intensity and affordability, and the amenability to operation and maintenance have relevance to the outcomes and impacts on different stakeholder groups.

**Combining Existing Capacities and Modern Technologies**

The idea of 'appropriate' technology, or appropriateness, emerges from a selection process between a set of technologies, that would best suit specific ecological and socio-political circumstances, the economic stage of development of the communities in question, and the needs felt most at any given moment.

The technology in question should not necessarily be the most scientifically advanced option, especially if it is not affordable, acceptable or justifiable by society, or if it transgresses the minimum thresholds for preserving the riverine ecosystems. In some cases, the search for appropriate technologies implies that available traditional techniques be adapted, brought up to date, and upgraded, especially if such techniques do not provide adequate solutions to

currently emerging demands. In other words, a technology needs to be appropriate in terms of objective functions and the local circumstances.

**Adapting the tradition of Sacred Groves, Bhima**

In Kolwan valley effective use was made of the traditional technique of constructing temple –tanks that held water at considerably high levels so that practically non-polluted water could be stored. A modern `pipe and distributary' system has been added to modernize the system, which then provides pure drinking and domestic water supplies to hamlets and villages, which don't reside at the bottom but on the ridges or higher ledger of the valley or catchment. These are cost effective structures, locally constructed in stone masonry managed by the community, and maintained through contributions collected locally.

In addition a large number of check-dams, gully –plugs, contour trenches, gated weirs on the main-stream, excavated rock-tanks, farm level percolation ponds and analogue afforestation techniques have been combined to optimize the surface and ground water resources through an integrated water balance plan.

Basic needs are usually best met through the use of locally driven technologies that are generally small scale and relatively inexpensive. Taking into account existing capabilities and needs of all members of local communities, including women, will result in the prioritisation and implementation of storage, distribution and delivery systems that are most suited to all community members.

**Dissatisfaction with Proposed Large-scale Structures: Khulna Jessore**

The Khulna Jessore case in Bangladesh offers a typical example of the potential of appropriate technology. Embankments and polders constructed to protect the land from tidal inundation in the 1960s had resulted in drainage congestion. To solve this problem, the Bangladeshi government in 1998 launched the Khulna Jessore Drainage Rehabilitation Project (KJDRP). After consultation with the local population, facilitated by CEGIS, two options were compared: a) construction of a regulator and b) Tidal River Management(TRM).



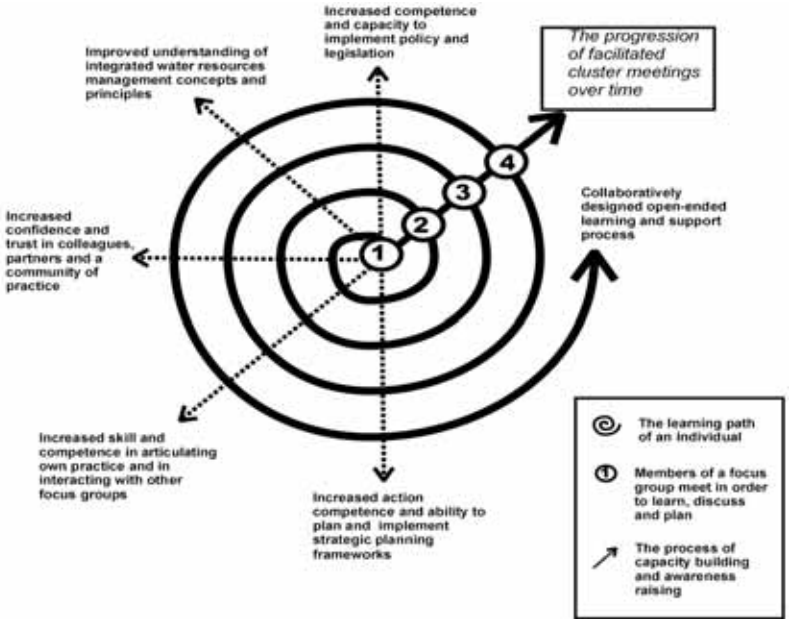
The TRM option had emerged as a result of a series of consultations between the local population and the NGOs and was based on the principle that an upstream tidal basin could generate enough tidal flow along the river to wash away the sediment coming in with the tidal water.

The true merits of the TRM lay in its social acceptability and improvements in the quality of life of the general people.

## 'Software' Technologies

Here, the term 'technology' is used two ways. First: in its conventional sense, implying the use of mechanical or civil engineering devices, structures, and physical systems. Second: as tools and methodologies for planning and design, information sharing and supporting negotiations and dialogues as techniques. For the sake of convenience, the former may be viewed as 'hardware', while the non-material techniques can be understood as 'software'. Reviewing the practice of all cases, the software techniques are of greater importance, since they fill existing gaps in management and planning and thus are critical for achieving active participation, equity in benefit distribution and for designing strategies that respect ecosystem requirements.

In the Sand River Catchment, special tools were used for tailer-made awareness raising and capacity development of key stakeholder groups in order to develop their understanding of concepts and practices associated with IRBM. AWARD developed appropriate learning support materials, base on the assumption that the level of knowledge and negotiation skills that are needed to participate meaningfully differs between stakeholder groups. A spiral model is used in order to avoid approaches that lack continuity, ensuring that there is an open-ended methodological framework rather than a rigid recipe for implementation. Learning in this framework is practice-based and situated within the realities of the catchment.




Source figure: *'Spiral framework', taken from Du Toit, Preparing People for ICM: a Proposed Learning Alliance for the Implementation of a New Legal Framework for Water Management in South Africa.* May 2005.

- The following important principles for learning in this approach are:
- Awareness and learning take time and are a continuous process;
- Awareness and learning are best informed by actual practice;
- Different interest groups have different needs and preparedness to learn is informed by these needs;
- All interest groups have prior knowledge and perceptions that influence learning;
- Different groups may have well developed and defined practices that determine actions, and;
- Learning is more than just about technical information. Skills development and an understanding of social and political processes are integral to meaningful learning.

This approach is an action/reflection one, the learning and understanding grow within a particular context as a direct response to local realities. The approach is, simultaneously, an opportunity to implement new policy, and an opportunity to learn from the implementation process though reflexive practice.

The level and type of economic and technological development preferred by a community, and the needs felt most at a given moment, have guided project partners in their acceptance or rejection of certain techniques, not because of the intrinsic value of the technique, but of the conditions for implementation and the outcomes. Sometimes, the idea of using an intermediate technique, or making more efficient use of an existing traditional technique was considered more effective in achieving a sustainable and equitable management of the micro catchment.

**Looking for Effective Use of Modern Technologies in Cotahuasi**

AEDES initiated a process of sustainable management of the Cotahuasi basin, back in 1996. Based on Agenda21, it made an inventory of the biodiversity in the area, and developed a strategic plan for the management and economic development of the Cotahuasi district and the province of La Unión. The possibility emerged of starting to use Information and Communication Technologies to support each activity. Since 2001, Cotahuasi has been equipped with a Telecenter, which provides access to internet, capacity building for local people.

The use of ICTs has contributed significantly to the commercialization of organic agricultural products. Also, women's groups have started to use the internet to improve women's health and to establish contact with like-minded organisations outside the basin. In addition, AEDES has been able to develop a GIS database, which facilitates the development of a zoning plan and has provided information that supports local negotiation processes over the use of land and water. Simultaneously the system provides the round tables with valuable input for their planning exercises and allows them to develop proposals that are acceptable to regional and even national decision-makers.



## Rights-based Approach to Technology

Project partners consistently consider, as a priority, the impact of technologies on the rights of communities and the risks they have to bear. Thus, the negotiated approach runs contrary to the conventional techno-economic approach, which tends to treats risks merely in terms of higher monetary costs, and rights as an issue to be determined either by law and policies, or by the market. The negotiated approach emphasizes the need to select technologies that favour the protection of community rights and entitlements, and minimizes the social and physical risks to the communities in question.

**Finding Innovative Solutions to a Wide Range of Problems in the Bhima basin**

In the case of the Bhima Basin, a package of diverse hardware and software techniques has been designed. While some have been applied, some are being deliberately opposed or avoided. In the Kolwan valley, for example, the farmers have been completely dissuaded from digging deep bore wells for irrigation. In addition, the experiences in surrounding catchments suggested that when private deep bore-wells were dug, even after completing the soil-water conservation works, the farmers had started mining ground water for sugarcane cultivation, thereby lowering the levels of the water tables and drying out the surface-dug wells. Therefore, the farmers from 16 villages came together and jointly decided not to dig any deep bore wells, except for drinking water supply. After getting the farmers to negotiate and agree at the micro-catchment level, Gomukh has been advocating and lobbying for the banning of private deep bore wells for irrigation purposes in all the arid areas of the Bhima river basin.

A consensus seems to be developing in other parts of the river basin to use deep-water wells strictly for drinking and domestic use and surface dug wells for irrigation.

Local users and field-based civil society organisations have in practically all case examples opted for, and convinced others, to adopt appropriate technologies. Based on their field experience, they conclude that, whichever technique disregards social risks and the distribution of costs and benefits, or goes against the main characteristics of the riverine ecosystem, the outcomes will be counterproductive.

A concrete example of the success of Gomukh to up-scale appropriate technologies concerns the replication of a revived spring tank tradition. The first six pilot tanks were financed by the German aid agency GTZ in 2001, allowing 6000 people in Kolwan valley improved access to drinking water. An awareness raising campaign through community demonstrations and lobbying generated the interest of the district government that sanctioned the rehabilitation of 40 tanks, representing an investment of about 1.9 million dollars. Now, the Maharshtra state government is supporting the rehabilitation of similar tanks over an area of 6.000km, reaching 600.000 people in the entire state.

### 4.4 Negotiated IRBM Based on the Ecosystems Approach

A primary requirement of successful 'integration' is recognition of the links between people and their environments. These links can be culturally determined, like in India where all origins of rivers are considered pious and sacred. Protection of these origins is protection of the hydrological cycle.

The people obtain benefits through eco-businesses such as organic agriculture and living-experience tourism. These direct benefits motivate the population to participate in the integral management of the ecosystems in the Cotahuasi sub-basin.

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The negotiated approach promotes consideration of ecosystems as defined by the Parties to the Convention on Biological Diversity (1992) in February 2004[7]: *"An ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way."* This approach recognizes that humans are an integral part of most ecosystems. It is thus designed to achieve a balance between people's immediate needs and the interests of long term sustainability. It bridges a concern for environment with an interest in human livelihoods and well-being.

The Bhima basin is facing problems related to excessive ground water abstraction, which results in a falling water table. consequently, almost all the watersheds within the Bhima are under stress. In view of this situation, the farmers in Kolwan valley decided to abstain from sinking anhy more irrigation bore wells. This decision, brought about through negotiations, included several trade offs and compromises, but in the long run it has proved to be beneficial for the communities as well as the ecosystems. Ground water tables in the valley are rising and this has resulted increased fodder availability and consequently a substantial rise in milk production.

An ecosystem approach essentially represents systems thinking. The foundation of such thinking is the recognition that any system is made of connected and interdependant parts. Following eco-systemic thinking means that a concern for social justice becomes a central aim. Thus, the interests

[7] Convention on Biological Diversity, Decision VII/11, UNEP/CBD/COP/7/21 Decisions adopted by the Conference of the Parties to the Convention on Biological Diversity at its seventh meeting. See also http://www.biodiv.org/decisions/default.aspx?m=COP-07&id=7748&lg=0

of local communities cannot be sidelined.They are an 'integral part' of the system. The Se San case is an example of this where sudden dam releases affected water levels, turbidity, sediment loads, fish population, flood plane agriculture and eventually the entire riparian community.

Since local communities already design management strategies based on such thinking, it is imperative to assimilate their wisdom within the broader spectrum of water management and development.

In cases of extreme events such as droughts, floods, both natural or as a result of dams, declining groundwater tables, sudden water contamination, trans-boundary disputes, or unfair appropriation practices, local actors have to cope with their changing environment. Because these ecosystem changes are directly felt at a local level, the people there have been able to assume an adaptive and responsive and often innovative approach to such changes. On the other hand people living in urban centres, psychologically distanced from the ecosystems that support their societies, have lost that flexibility. This poses a serious threat to their capacity to cope with sudden events and ultimately to adapt to long-term changes, which is especially relevant in the current century of rapid climate change.

> During the 2004 drought in India, Kolwan valley was the only valley that stayed green and did not need to be serviced by water tankers. Gomukh had worked on water conservation strategies with the communities in the valley developing policy and management mechanisms that include and encourage local actions. Also many surrounding villages benefited from the capacity of the villagers to react to this sudden change in their living environments.



Consideration of the ecosystem within the negotiated approach is key to meeting the needs of IRBM. A better understanding of the catchment as a whole, and an understanding of the interactions and interests of the people whose livelihoods depend on these, means stakeholders will be in a better position to negotiate a common vision, assert their rights and accept inevitable trade offs.

The fundamental premise is that by understanding linkages and developing a sense of the 'whole' (i.e. the linkages between socio-ecological systems) people also develop a sense of ownership and responsibility. By adopting an ecosystems approach the emphasis changes from one of self-interest in a vacuum to one of a contextualized self-interest or, at best, an interest in the whole. In the South African case, out of adopting a systems approach, strategic choices have been made. For example, the conversion of commercial forestry to a conservation-based land use has been made on the basis of the catchment-wide benefits. Likewise, the operating rules for agricultural schemes have been designed to ensure that the Reserve (the minimum amount of water to meet basic needs each catchment resident is entitled to) is met downstream.

### 4.5 From Negotiation to Up-scaling

Sustainability in river basin management can be achieved if all relevant actors recognize the need to examine the policy and investment decisions at the national and basin level, as well as their relevance and implications at the local level. In this way, they can find ways to bring all levels together.

It is essential to feed policy discussions by analysing how local river basin management strategies relate to centralized systems and master plans that currently dominate the practices of international agencies and state level authorities. For this, civil society case-holders have often had to persuade, and at times force, the authorities, where appropriate, to be flexible and open to suggestions.

> Gomukh representatives once persuaded the district CEO and the district magistrate to walk for half a day through farms and forests. They were shown a beautiful spring tank at the origin of the river basin, to convince them of the need to construct a series of rock tanks in the upper watersheds for regulating downstream flows. This suggestion was not only accepted and financed, but it has now become a part of a budgeted state policy.

Bringing the levels together has to begin with an open discussion between all of the stakeholders about the ends and means of water management. Theories and concepts of hydrology and engineering have understandably been an integral part of this new way of thinking. However, they cannot dominate the debate as they have done in the past. Other voices have to be included, and water planners have to become truly accountable to diverse human societies and to nature as well. An open discussion also is attempting to create a reasonable level playing field between all stakeholders, where everyone is equipped to take part in the negotiations.

> The Thai example illustrates the differences between the approach of the state and of the community. The NCSCC laid the basis for negotiation through research on these differences, the implications of the current water management schemes, and the current local practices. Thus it created a locally derived and locally-owned body of knowledge about water management in Nan, allowing local people to have a stronger position in negotiations.



Bringing the levels together has another relevance; river basins have extremely diverse political, cultural and economic contexts. Centralised, master plan, approaches by definition cannot respond effectively to this diversity. Such approaches generalize solutions, ignoring the diverse realities of their areas of influence. On the contrary, local action, by definition takes into account that diversity, though it may not be able to oversee all the implications and necessary actions on a larger level. The traditional weir and channel systems in Thailand are a case in point.

Local actions therefore must be recognized for their potential to contribute to sustainable river basin management, and should not be treated as an extension of the government agencies for implementing centralized policy and project decisions. The vision behind local management is considered as too locally specific and therefore not integrated in basin level policy discussions. Thus the experiences gained on local levels are too often lost in the design process of basin management plans. In fact, many local actions are initiated in areas where centralized decisions have no impact, or as a reaction to the negative consequences of these decisions on people's livelihoods. Local action therefore needs to be appreciated as a valuable source of input in policy formation and in the designing of management strategies, also when management policies of entire basins are being discussed. Discussion and negotiation with different stakeholders on different policy levels is thus crucial in the process of scaling up the vision and the approach.

## Horizontal and Vertical Up-scaling

`Up-scaling' is a term used for moving an initiative beyond the local level. Horizontal up-scaling, also called `replication', increases the number of people involved in the initiative and allows for a growing geographical area of influence. Here, negotiation allows for the inclusion of the vision and needs of all those that are becoming involved. Vertical up-scaling links local initiatives to higher-level policy and public institutions. Negotiation takes place between a group of local actors that have unified their vision and proposals for action, and stakeholders from other areas in the basin plus representatives of central policy institutions and decision-makers. Often vertical and horizontal up-scaling go together. Using an approach on a different scale regularly implies involvement of institutions at a different policy level (vertical) and at the same time it implies reaching more people at a larger geographical area (horizontal). Up-scaling means that the principles of a vision remain intact, but that the practical matters may need to be changed. Meanwhile, the bottom line will remain the same: participation, sustainable use of resources and social equity. Up-scaling is a key issue for the partners in this project because they all strive for bottom-up river basin management, allowing their local vision to become an integral part of policies and institutional frameworks at a higher level.

Up-scaling a vision requires several characteristics from the organisation involved, such as changes in organisational capacity, so that the organisation can handle unforeseen consequences of operating at a larger scale. Sufficient financial resources and qualities such as good communication skills, strong management, skilled personnel and the creation of structures that allow for flexibility, participation and accountability on a large scale, such as transparency and a system for resolving management conflicts. These requirements are not always recognized. Taking these into account during negotiations will boost the chances for successful up-scaling.



Between 1989 and 1995 Gomukh demonstrated participatory planning, capacity-building, and poverty alleviation successfully at the single village level in India. The major criticism from the establishment was that such experiments were not replicable at the macro-scale to cover even sub-basins, let alone the larger river basin. It was argued that success at a single village was possible only when a high profile and charismatic social leader or organisation was able to inspire social transformation on the one hand, and acquire financial and technical support from donors, on the other. To counter and disprove such criticism and apprehensions Gomukh took up 16 villages in the Kolwan Valley for simultaneous planning and development between 1995 and 2002. In the year 2002, Gomukh ventured to scale up the model to 25 villages with an area covering 16000 hectares, in the Shivaganga valley of the Bhima basin. Interestingly, the area covered by the Shivaganga project is equal to some of the medium and large-scale dam projects in India. This scale of activity could hardly go unnoticed, and Gomukh is being recognized today as a lead organisation at the district and state levels, showing that it can be done. Currently, The Council for Equitable Water Rights, and Gomukh are involved in planning comprehensive watershed development activities for Chikotra valley, with an area of 32,000 hectares and a population of approximately 90,000 people.

Many of the challenges of up-scaling are a result of the participatory character of the process. The involvement of different stakeholders means the involvement of different organisational cultures and interests and might lead to conflicts among stakeholders. On a larger scale the relationships with researchers and government might become more politicized. The challenge is to maintain participation and accountability. Many attempts in scaling up also lack good monitoring and evaluation. These should start with having baseline data and control sites and a good overview of local circumstances, so that overall trends can be identified with reasonable degree of accuracy.

AEDES' long-term objective is to scale up the experience in the Cotahuasi Sub-basin to the whole of the Ocoña Basin, to the entire Southern Zone of Extreme Poverty and to the high provinces of Arequipa. The work done in the Cotahuasi Sub-basin is already being replicated in other upstream areas of the basin. Focus is on up-stream areas, to enable stakeholders to negotiate with the down-stream organizations and water users on \integral management of the basin. Thus, replication will increase political clout, to achieve policies and interventions that improve livelihoods and respects the knowledge and vision of the marginalized, up-stream communities. AEDES has been supporting local Water User' Boards, which represent irrigation groups and support them in carrying out their activities. To allow these Boards to influence decision-making on a regional and national level, AEDES is fomenting a platform for the integral management of water resources, in the Ocoña Basin. After successful First and Second Assemblies of the Ocoña Basin Water Users' Boards, the next step is to now fully include them in the Institute for the Promotion of Water Management (IPROGA)

# Conclusions

# 5 CONCLUSIONS

The conclusions offered here are based on the seven case documents presented and finalized at a meeting of all project partners, held at Dordrecht, the Netherlands, in July 2004. They also draw on the discussions that took place since 2002 during various meetings and exchange visits to the areas where project partners are working, such as India, Bolivia, South Africa, Bangladesh and Thailand. This final chapter thus captures the immense variety of socio-economic and ecological circumstances encountered in the three continents, while simultaneously retaining the focus on the generic elements in the larger context of developing the 'Negotiated approach to IRBM'.

Based on experience with community management, it is clear that inputs from grass-root level stakeholders have often been catalysts for bringing about paradigm shifts at national policy levels. Local actors can put forth their views on national schemes, which would be relevant and useful to local communities, suggesting modifications and innovations which achieve the best possible benefits, making the final policy plan more sustainable and equitable What is claimed here, therefore, is that the serious flaws of today's river basin management approaches can be overcome effectively by building on local actions and vision.

## 5.1 The Merits of the Negotiated Approach

The negotiated approach, being decentralized and flexible, is effective in making water available at the grassroots level to areas where the mainstream system often does not reach. It provides access to water for domestic purposes and protective irrigation by developing systems that can be owned, maintained and managed by the local communities for satisfying various needs. Thus, the negotiated approach contributes to achieving the UN's water related Millennium Development Goals.



The negotiated approach empowers local water users, through the creation of formal and informal water management institutions and the formalization of existing knowledge and vision. Simultaneously, it sets out to make wise use of ecosystems. Thus, in addition to helping to achieve the Millennium Development Goals related to water provision and environmental sustainability in 2015, it ensures that these achievements will be maintained after the MDG deadline.

**Community Ownership**

Negotiations and participation lead to ownership of the initiative because local communities are continuously involved and engaged in processes that directly affect their livelihood. An important implication of this approach is that the community opts for development solutions which are the least socially and environmentally disruptive.

Further, recognition of their insights, knowledge, and respect for their opinions, leads to a feeling of ownership.

**'Participation Fatigue'**

When institutions and procedures for negotiation are self-driven, sustained, and transparent, they do not lead to what is called 'participation fatigue'. It is only when government departments and project proponents treat participation as 'one-off' consultations, or when departments hold them for procedural compliance, that the periodic participation exercises cause boredom and disinterest.

In addition negotiations do not necessarily guarantee satisfying all needs, and they do not always naturally consider ecosystem characteristics and limits. But when much time and attention is paid to details about who will negotiate and how, and what the agenda will be, and which discussions will follow or lead which decisions, then the process can be very meaningful and productive.

**Effective institutional Set-ups**

The Negotiated Approach pays significant attention to the development and implementation of appropriate `hardware' techniques like small water impounding structures, land shaping techniques, appropriate water lifts and pumps, which are cheap and easy to operate and maintain. The Approach enables communities to internalize participatory processes as part of the broader objectives of improving the quality of daily life.

The implementation of these interventions allows for the establishment or strengthening of co-operative organisations for management and operations, and for the equal sharing of benefits. These co-operatives, in turn, make scaling up possible. Water user groups can combine and form representative affiliations which can meet periodically and negotiate the sharing of water, regulated releases from structures along the drainage lines, and adopting improved techniques of crop production and management practices. The negotiated agreements between farmers and processors of food crops, help in establishing links with forward markets, which procure better prices and increase income. As the physical benefits build up co-operation continues along with progress towards sustainable livelihoods.



## 5.2 Negotiated Approach and Up-scaling of Local Initiatives

The Negotiated Approach to river basin management has been applied and proved to be effective at diverse locations. It is no longer merely 'experimental' and 'marginal'.

All project partners can translate their practical experience in fieldwork in parts of river basins to a broad basin perspective in their policy analyses and advocacy activities. The documented Negotiated Approaches to river basin management strongly indicate that local initiatives can form the basis for scaling up and application in policy and legal frameworks at river basin and national levels.

In fact, the Negotiated Approach includes local people as well as urban and industrial stakeholders. It considers the interests of upstream and downstream actors, including small and large farmers.

These multi stakeholder processes result in:

- The creation of physical infrastructure such as water impounding structures, channels, delivery systems for domestic, agricultural and industrial use, soil and water conservation measures. The 'hardware' created through the Negotiated Approach is appropriate technology as it respects both the interests and management capacities of local actors as well as the needs of ecosystems.
- The establishment of formal institutions at all levels as well as informal social organisations with an increased social awareness of natural resources that are able to disseminate information, and understand and evaluate variable social and ecological factors. These institutional structures establish platforms for discussions, negotiations and informed decision-making. They increase the transparency of financial management, and create the procedures necessary for scaling up local actions to the basin level.
- The formalization and inclusion of local knowledge and vision, which, in turn, is a primary condition for the development of the capacities of local communities and representative groups to engage effectively in negotiation processes and participate in decision-making at various levels.

## 5.3 Economic, Financial and Time Efficiency of the Negotiated Approach

The majority of the project partners have started to take a closer look at the economic and financial sustainability of their initiatives. Based on their first experiences with financing, the following first conclusions can be inferred:



**Substantially Lower Costs**

The Negotiated Approach delivers at substantially lower costs than conventional approaches. The first evidence from the cases suggests that local initiatives developed along the lines of the Negotiated Approach reduce vulnerabilities and deliver local services sooner and at a substantially lower cost. Relatively small scale local actions bring down the overhead costs and investment needs per household or hectare. The creation of infrastructure and delivery systems draws on local contributions of labour, materials, and skills, through direct community involvement and commitment.

In order to be able to compare the cost effectiveness of the conventional approaches with the Negotiated Approach, it is necessary to reconsider the ways in which global or even national organisations calculate costs. Such a comparison should link the enormous overhead and transaction costs incurred by centrally- operating institutions with their mostly sectoral focus and proven inability to reach large parts of rural and marginalised populations. It should consider the fact that local approaches are holistic, generating mutual benefits between sectoral goals, and that they build on local resources that are often available at a very low cost.

**Internalizing and Compensating**

The Negotiated Approach creates processes that allow community representatives to discuss and negotiate varying needs and shares at the village or sub-basin level. Thus, communities are capable of internalizing the social and environmental costs of resource development. Given sufficient time and support, communities are capable of sharing and distributing benefits and cost burdens that go beyond mere water resources management in an equitable manner.

Given that the people affected and the beneficiaries both live and work in close proximity, they can interact directly and arrive at feasible agreements on compensation and rehabilitation.

**Effective Use of Time**

The Negotiated Approach takes time but is eventually more time-effective. The time scale required for building physical infrastructure is governed by the availability of the finances, materials and technical skills. When these are available the time required for installing and establishing such physical assets can be easily anticipated. On the other hand, social engineering, the empowering of historically deprived communities, and generating an awareness are processes which take relatively more time. However some of our project partners have achieved demonstrable results within a period of as little as two years.



**Cost Effective through Comparative Advantages**

Each location has a comparative advantage, endowed either by natural, historical or cultural factors. Unlike the top-down approach, local initiatives take advantage of their specific circumstances, and therefore generate economic gains against lower investment costs.

**Financial Diversification is the Key to Sustainability**

Diversifying the sources of funding is proving to be an important means of reducing financial risks. It enables the community organisations to maintain their independence.

Initiatives are developing different strategies towards reaching financial sustainability. The mobilization of local resources, which increases self-confidence and independence, is the basis for these strategies. Interventions at community-level therefore often start with the identification and development of income generating activities.

Simultaneously local or central government agencies are called upon to take on a substantial part of the financing responsibility. Foreign aid agencies come next as they bring international recognition and a higher degree of legitimacy. Finally NGOs also get assistance from corporate sector funds and development banks.

Certain key activities and characteristics of the Negotiated Approach, such as the capacity building of local actors, the time needed to achieve measurable

results through negotiation, the scale of operation and the diversity of small scale actions developed simultaneously, are very important for the voluntary organisations. Funding agencies, however, prefer tangible projects that deliver actual goods and services. Given the effectiveness of the Negotiated Approach, these donor preferences should be reconsidered.

## 5.4 Negotiated Approach and Ecological Sustainability

### Tackling Communities Real Life Complexities through Negotiation

The Negotiated Approach combines the ability of negotiation to include all stakeholders with the merits of the ecosystem approach that treats river basins as integral ecosystems. Thus, it reflects the real-life experience of local communities who face social and environmental challenges as a complex whole, and not as sectors or academic disciplines. Land rights, livelihood, forest and biodiversity, surface and ground water, the impact of upstream structures, urban politics and natural events like droughts and floods are all taken as parts of an holistic problem with various facets.

Combining the ecosystem approach with negotiation adds to the robustness of social as well as ecological systems. Local actions often rely on intuitive wisdom to react and respond quickly to unexpected and undesirable surprises and events due to their intrinsic flexibility and their direct relation to the natural resources surrounding them. The ability of communities to cope, are based partly in historical experience, and partly on survival instincts.

While the Negotiated Approach builds on local communities' appreciation of the importance of natural ecosystems, it also accepts that, in times of acute environmental crises such as droughts, these same communities automatically shift their priorities towards satisfying human needs for sustenance and survival. These coping strategies need to be understood and appreciated by mainstream communities.



### Negotiating for the Entire Basin

Negotiation substantially enhances IRBM since it treats basins as an integral ecosystem, where all subsystems and man-made sectors, located within different river regimes, are viewed as being interlinked and interdependent. Consequently, no problem or sector can or should be dealt with in isolation.

This inference reflects the real-life experience of local communities who have to face problems as a complex whole, and not as discreet sectors or exclusive issues. For example, land rights, livelihoods, forest and biodiversity, surface and ground water, the impact of upstream structures, urban politics and natural events like droughts and floods are all taken as an holistic problem having a variety of symptomatic facets.

This approach strengthens the robustness of social as well as ecological systems, thus making them less vulnerable and more resilient and creating better coping mechanisms. In times of droughts, floods and other abnormal stresses on the river basin the impact of such extremes is cushioned, since the community instinctively, and often ingeniously, responds to them, instead of waiting for the official system to swing into action.

## 5.5 Negotiated Approach and Social Justice

### Conflict Resolution through Negotiation

The importance of participation and negotiation as a tool for the resolution of conflicts is now well established. In many cases the local actions are provoked by conflicts over water or other natural resources. However the existence of a mechanism for dialogue within the community, and networking, helps to resolve the conflicts through negotiation. In fact, through negotiation, communities even internalize the conflicts and find solutions acceptable to all.

In many cases the local actions are provoked by conflicts over water, or by natural or man-made calamities, and they continue till well after the issue is resolved. Negotiations can also be used for creating level playing fields between stakeholders. Local initiatives essentially choose development options which are socially least disruptive and which do not cause human displacement. When the situation requires it, the locally preferred option may also cause minor displacement. In such cases however the local community decides to internalize the displacement by adjusting or compensating land and water rights, or by providing access to other resources like fodder, fishing rights, and forest produce.

Negotiations can be used as a vehicle for reducing the prevailing imbalance of power. Striving to correct this is an important though difficult objective. Creating larger groups, either affiliations, unions or specific interest co-operatives are options for improving power relationships.



## 5.6 Negotiated Approach and Appropriate Technology

### Combining Traditional Systems with Modern Know-how

Through the analysis of local knowledge, characteristics of the ecosystem and modern know-how, the Negotiated Approach can bring traditional systems up to date by combining them with modern technology. This allows for the development of appropriate technologies that answers to social needs, local capacities and respects or even builds on distinct characteristics of the ecosystem.

### Options Assessment Key to Decision-making

There is a need for the assessment of options and the inclusion of local communities to ensure sustainable decision-making. The negotiated approach accepts 'options-assessment' as an important basis for decision-making, and does not consider mere participation within a 'project-framework' as adequate.

Consequently, decisions regarding the choice of technology, the location of structures for water-impounding or distribution, rates to be charged for operation and maintenance, the inclusion of the needs of historically deprived communities, the continuation or modification of traditional agricultural and other practices, are all issues to be negotiated before any major decision is taken regarding any projects at the river basin level. It has been demonstrated that local communities are more effective if they are involved

in identifying and quantifying their own needs, assessing the available options, and implementing them at their own pace, rather than being brought into the picture after major projects have been formulated and finalized.

**Cutting costs through Grass-root Level Practices**

The technical and delivery systems that are preferred by local communities can be given priority once the existing capabilities of local communities are taken into account in the planning process. Such technology is usually appropriate to the unique local environmental, social and economic context and in many cases, is already being used. Installing electric water pumps in South African villages while the state still has to finish bringing electricity to the area, and which rust away after one breakdown because nobody understands how to repair it, is an example of non-appropriate technology. Building on the traditional weir systems in Thailand however is much more appropriate to the local context. Thus the final cost of the resource is much less, unit for unit, than if an elaborate and formulaic technology is imposed which ignores the local context.

## 5.7 Negotiated Approach and Community Organisation

**Increasing Community Organisations' Influence**

Adopting the negotiated approach has enabled community organisations to gradually increase their influence through multi-stakeholder negotiations.



The strength of local actions and initiatives lies in creating networks of volunteers, like-minded organisations, 'friends' in academia and administrative organisations, media figures, doctors, lawyers, advocates, poets and priests, and in rare cases even politicians. These informal, non-financial relationships are the greatest assets of local initiatives. They also act as links and mediators between the establishment and local communities.

**The Negotiated Approach Separates the Politics from the Party**

Unlike agencies confined to the straight jacket of a particular sector, NGOs can mobilize and make the best use of community resources through sustained efforts at public relations. NGOs play an important role in helping local actors to articulate their demands, providing a platform at local, national and international levels for creating awareness, lobbying and advocacy and preparing the path for negotiations, and people's empowerment.

In most cases the credibility or sustainability of local organisations is maintained by staying away from political parties and electoral politics since it is common experience that elected representatives have to follow a party line that may not be in the interest of the community. The negotiated approach therefore makes a distinction between taking political positions regarding policies on the one hand, and electoral party politics on the other. In rare cases however, lobbying either the party in power or the opposition parties can prove beneficial, especially if it is to do with budgetary allocations and law or policy reform or implementation. In any case a formal mechanism for conflict resolution with a mandate from the central and local government is essential

and requires support from professional lawyers and activists who are able to involve themselves in the community activities and are willing to represent the cases of local communities through policy-making, reforms, or actual litigation.

### 5.8 Follow-up

The results of the individual cases, as well as the analysis of the broader issues related to each specific approach, show that local actions and visions do make a contribution to sustainable river basin management, are able to negotiate to give and take, and should therefore be recognized as full-fledged elements of any water policy design and decision-making process.

In view of the conclusions stated above, we recommend following *actions to further develop* the Negotiated Approach and strengthen the position of local organisations working with it:

a. Expanding the network of practitioners of the Negotiated Approach to further develop the knowledge and experience base;
b. Presenting the Negotiated Approach at basin, national and international policy forums to obtain status and recognition;
c. Creating an international network where water-related agencies committed to the Negotiated Approach, including banks and donor agencies, policy experts and practitioners, can come together to understand and strengthen their roles and responsibilities towards replicating and scaling up the concept in as many river basins and sub-basins as possible.



In financial terms, such activities would require:

d. The support of lobby and advocacy, as well as information sharing activities to discuss the Negotiated Approach. These efforts will allow for the internalisation of the approach in mainstream IRBM thinking and thus contribute to bridging the gap between top-down and bottom-up management
e. The allocation of budgetary provisions by governments for scaling up the Negotiated Approach through regular policy processes. Plus the creation of a substantial international revolving fund to support negotiated initiatives.

The analysis presented in this publication is based on seven case studies and the experience and knowledge gathered over the years by a project team of 15 water management experts. Part of the discussions focused on issues on which the team has strong intuitions, but recognizes that further research is needed:

f. The project team believes that the Negotiated Approach is more cost effective in achieving sustainable development compared to the techno-economic and IRBM approach. There is a strong assumption that the Negotiated Approach can achieve poverty alleviation and can increase livelihood security with lower financial and human resource costs.
   A comparative cost-benefit analysis of the three approaches, based on a limited set of case examples, is needed to test these assumptions.

Such an analysis should include and compare economic, social and environmental costs;

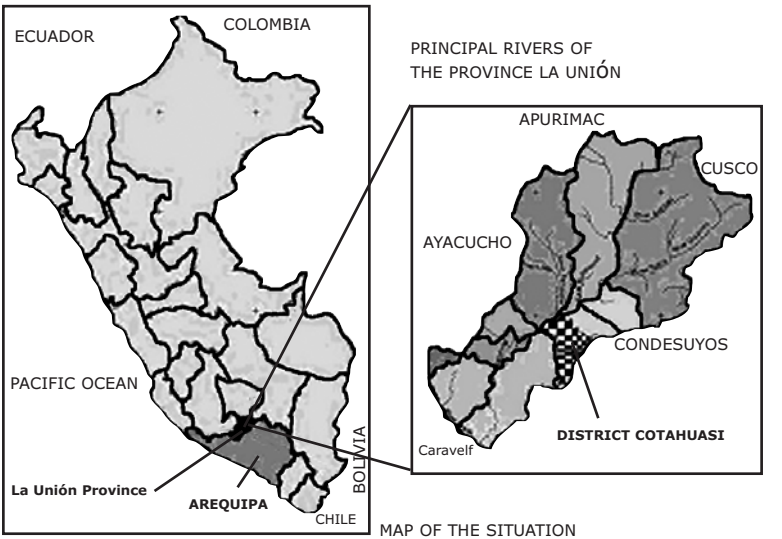
g. The ecosystems approach is one of the fundamental elements of the Negotiated Approach. To substantiate the claim that local actors are more conscious of the need to preserve essential ecosystem goods and services, a comparison has to be made of achievements, in terms of wise use, conservation and protection of ecosystems, between the three river basin management approaches described in this project;

h. Until now, financing of the project partners activities has been mainly through development co-operation. Most initiatives face serious challenges to achieve financial sustainability of especially the local institutional structures that are being created. Expectations are that financial sustainability will only be achieved by combining state and fiscal resources with local resources. An analysis of current successful models for financing, of potentially viable innovative financing arrangements, and a discussion on current obstacles, will help organisations to include such strategies in their future work and with that become less dependent of development and external financing.

# Appendix

# Case-study 1
# The Management in the Cotahuasi Basin, Arequipa,Peru

## 1 Basis Statistics




MAP OF THE SITUATION
OF THE PROVENCE LA UNION IN PERU

*Source map: AEDES and Instituto Geográfico del Perú*



| | |
|---|---|
| *Main river basin*: | Ocoña River and watershed, of which Cotahuasi is a sub-catchment |
| *Altitude*: | Ocoña: 0 to 6337 m. Cotahuasi: 950 to 6093 m.a.s.l.[1] |
| *Total river basin area*: | Ocoña: 15667 km², Cotahuasi: 4473 km² |
| *Average annual rainfall*: | Between 80 and 1000 mm. per year |
| *Description of the area*: | This sub-basin in a mountainous area contains three morphological zones: mountains; the high Andean plateau and the eroded river basins. There are 6 climate types; the region has 12 life zones, with a very rich biodiversity of flora, fauna and agrodiversity. |
| *Population*: | Ocoña: 70.000 people in 1993; Cotahuasi: 17.500 people |
| *Main income activity*: | subsistence agriculture, cow and lama breeding |
| *Average household income*: | US$ 51 per month |

## 2 Main Challenges in the Cotahuasi Sub-catchment

The province of La Unión is a remote area in the mountains of Peru, where malnutrition, poverty and illiteracy are common. Cotahuasi district is considered as part of the 'mancha de probreza' (stain of poverty) of Peru. The region counts various environmental problems like land degradation and

[1] m.a.s.l is 'meter above sea level'

desertification. The water management is organized by a national law and is not adjusted to the local circumstances with its own specific characteristics.

Due to political happenings in the 80's, the social texture in the province has been destructed. The NGO AEDES has come to the region to help improving the quality of life for its inhabitants and to look into possibilities for sustainable development of the Cotahuasi watershed and possibly the larger Ocoña River Basin. One of the main characteristics of the Cotahuasi watershed is its large biological diversity.

## 3 Stakeholders

*Case holder*: AEDES, Specialized Sustainable Development Association: a non-governmental organisation that supports and stimulates organised participation in the local management of natural recourses by women and men with different cultures, with the ultimate objective to improve their quality of life.

*Stakeholders*: MCPLU (Mesa de Concertación Provincial de la Unión, a round table at provincial level, which is in charge of the execution of the local Agenda 21), MCD (Mesa de Concertación Distritales, round tables at district level), population of La Unión Province as the main target group, irrigation commissions and committees, farmer organisations, PRONAMACHCS (National Project for the management of watersheds and the protection of the ground), ATDR (Administración Técnica de Riego)



## 4 Case-study

AEDES has several activities with local communities in the basin, and gives priority to empowerment and capacity building towards sustainable development, for example through the strengthening of the organic agriculture activities in the area. Medicinal plant production in the high parts of the Cotahuasi Sub-basin, eco-tourism, and setting up a protected nature area to prevent mining and other unsustainable activities are all part of AEDES' activities.

Since water management is a key element such development, increasing attention is being paid to the use of available water and the appropriate management of the watershed. Also preservation of the traditional relationships between people and water, such as the water fests, and the strengthening of the institutional base of organisations in the river basin belong to the work of AEDES.

AEDES strives for replicability of its approach to empowerment, yielding insights regarding ways in which water management forms a part of sustainable livelihoods and ways in which legal structures can support the development of bottom-up river basin management initiatives.

Experience gained in Cotahuasi will be used to develop a similar approach in similar sub-basins in the upper Ocoña watershed. At present, the eight

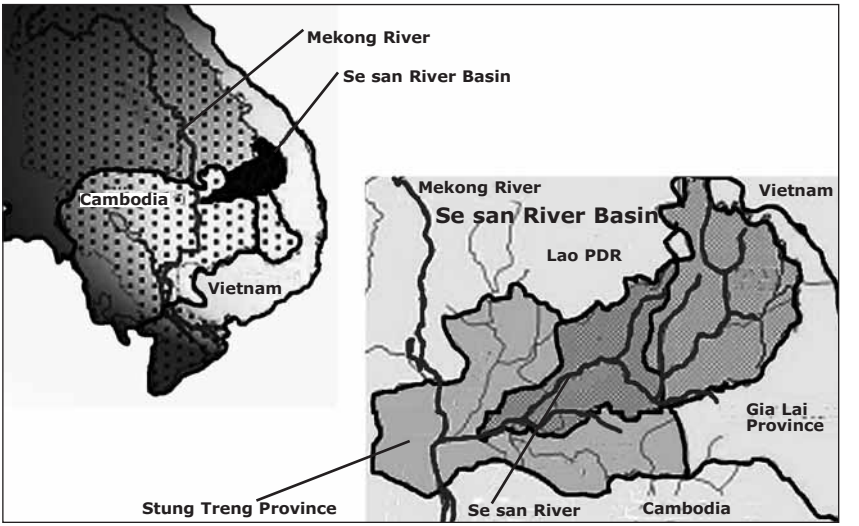
provinces are increasingly able to negotiate their position vis-à-vis stakeholders in the lower basin.

## 5 Some Specific Conclusions from this Case-study

- Feasibility of water management of basin level activities is higher when linked to a bigger objective like sustainable development;
- It is easiest to solve conflicts at the lowest possible level, through the platforms established at that level. Some issues are to be discussed at a specific level, whereas others are general issues that are applicable to the basin level negotiation platform;
- In the negotiated approach, not only discourse and prescriptions are to be discussed. Besides sketching the desired picture, practical mechanisms to implement measures getting you to this desired stage should be on the table, and political will to enforce them is as important;
- Water management should not be considered in isolation but always linked to the rest of the natural resources, and especially to biodiversity;
- The *Platform of the Junta de Usuarios* of the Ocoña River Basin functions as a sort of Confederation of a large number of water user associations in the basin. As a result of their large membership, it is increasingly able to negotiate the interests of water users in the basin vis-à-vis other stakeholders.

# Case-study 2
# The Case of the Se San RiverBasin, Cambodia

## 1 Basis Statistics




**The Mekong River, Cambodia and Vietnam**

Source map: AMRC

| | |
|---|---|
| *Main river basin:* | Se San River, which is one of the largest tributaries of the Mekong River. |
| *Altitude:* | The Yali Falls dam in Vietnam lies at 515 m.a.s.l. |
| *Total river basin area:* | 17.100 km² (Ratanakiri Province is 12.500 km²) |
| *Average annual rainfall:* | 2,000-3,000 mm. |
| *Description of the area:* | Forested lowlands with seasonal varieties in river heights. Nine different ethnic groups live in the province, in villages mostly along the river. The Se San River Basin is one of two extremely remote international sub-catchments of the Mekong River Basin located in Ratanakiri Province. |
| *Population:* | 72.000 people (Ratanakiri Province) |
| *Main income activity:* | subsistence, rain fed agriculture, livestock rearing, fishing and non-timber forest products |
| *Average household income:* | 109 US$ per month in 1996, 46 US$ per month in 1999. |



## 2 Main Challenges in the Se San River Basin

The Se San River flows from Vietnam to Cambodia, before flowing into the Mekong River. Hydropower developments in Vietnam (the Yali Falls dam, and five other dams that are planned to be built on the Se San River) have created a very real and acute threat to the majority of the local indigenous communities in the catchment.

Following the operationalisation of Yali Falls, Se San's flow regimes have changed dramatically, causing unusual flooding events and increased dry season flows. More recently, Ratanakiri has become the frontier for proposed industrial plantations, hydroelectric projects, and logging concessions.

The needs, customs, and traditional livelihoods of the province's 50,000 indigenous inhabitants are consistently ignored. The Environmental Impact Assessment carried out by the Vietnamese for the Yali Falls dam never investigated the downstream impacts beyond the Vietnamese border.

The basic rights and legal underpinnings of local indigenous communities' access and use of resources within the basin are ambiguous. Mostly, these rights are not formally recognised. Furthermore, within Cambodia there is no existing national framework for river basin development and management that could represent local community wishes. Lastly, the Se San is an international river basin where the threats to sustainable development of the basin lie within the national jurisdiction of another country. The Mekong River Commission has neither authority nor the institutional mandate to arbitrate on cross border developments, and can only intervene when requested to do so by a member government.

## 3 Stakeholders

*Case holders*: 1) AMRC, the Australian Mekong Research Centre, which works at the research/advocacy interface in close support of local partners' needs in the Mekong Region. AMRC's mission is to provide a policy level research, analysis and capacity building resource in support of development paths that maintain the integrity, diversity and symbiosis of local livelihoods, cultures and ecosystems.
2) The Se San Protection Network, SSPN, a community-based network organisation representing over 50,000 people living in the Cambodian provinces of Stung Treng and Ratanakiri, in the Se San Basin.



*Stakeholders*: SSPN, MRC (Mekong River Commission, the river basin authority), EVN (the Vietnamese government agency responsible for hydropower development), National Mekong Committees, local government, SEARO (Oxfam America South East Asia Regional Office) and Oxfam Great Britain, NGOs such as TERRA (Toward Ecological Recovery and Regional Alliance).

## 4 Case-study

In reaction to the sudden changes in river flows, and after having asserted that these were caused by major up-stream interventions on the Se San River, communities along the Se San formed the Se San Protection Network (SSPN). The Network's main short-term objective is to negotiate for the restoration of the Se San River flow and a compensation system for the damage done. In the longer term, it hopes to limit further construction of hydropower dams in the Se San River.

As a starting activity, the SSPN has been documenting the impacts and developing its own visions for the catchment. AMRC has supported the SSPN

in their efforts to influence the Mekong River Commission, allowing for the development and articulation of their vision on the future development of the Se San River Basin. Support includes the development of baseline analyses, synthesis of activities, workshops with NGOs and policy makers, participation in drafting policy proposals, and the linking of the SSPN with similar organisations in the region. Also, it facilitates the two-way communication between the SSPN and the project.

To date, there have been some indications from the MRC that there is an increased will to engage with civil society in a more substantial and meaningful way. The key determinant in whether this will be possible will be the response of the National Mekong Committees, and other national implementing agencies with projects in river basins.

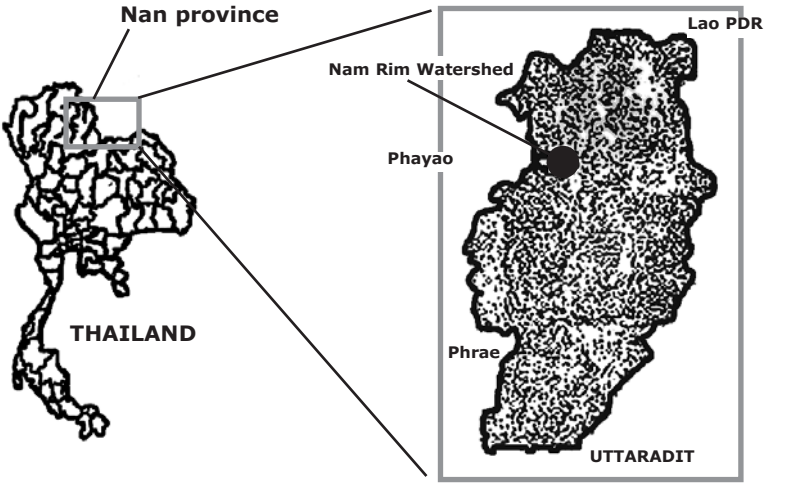
Using their own investigations as leverage, the SSPN gradually started to approach decision-makers, beginning at the local, provincial level. Following a slow, but determined process, the Network has been gaining access to national policy makers. Recently, it managed to table a list of questions to the Vietnamese Presidency, through the Joint Vietnam Cambodia Se San Committee. Progress is slow, but increasingly the issue of the Yali Falls is appearing on the national and regional water management agenda.

## 5 Some Specific Conclusions from this Case-study

- The SSPN has been essential to create solidarity between different indigenous groups across a large area, and the network has empowered communities to voice their concerns and demands in an open and unified manner;
- The participation of provincial and district government officials in the network and in research has been valuable for galvanising local political support for the advocacy work, and can help to broaden trust in the validity of research findings. Thus is has played a role in the up-scaling of SSPN's advocacy work;
- Negotiated approaches need to build up trust that comes with sharing power in decision-making processes, and bureaucratic cultures within governments that are receptive to negotiated approaches are therefore key;
- The building of an international coalition network has provided the SSPN with strong technical, advisory, analytical and advocacy resources. The international coalition in turn could utilise the local network to raise community concerns at the international level;
- Networks that have grown organically are the most valuable and effective ones;
- Until all actors (including donor agencies) recognize and are accountable for their roles in the origins of a conflict, including the indirect support/funding of the dam, no just and equitable outcome is possible.

# Case-study 3
# Water Management in the Nan River Basin: Key Issues of Negotiation, Thailand

## 1 Basis Statistics




*Source map: AMRC*

| | |
|---|---|
| *Main river basin*: | Nan River, one of five tributaries of the Chaophraya River, and the longest river in Thailand. Nam Rim and Nam Yao are tributaries. |
| *Total river basin area*: | Nam Rim watershed: 71 $km^2$ |
| *Description of the area*: | The upper part of Nam Yao and Nam Rim is mountainous. It gradually goes into valleys that people use for paddy cultivation, the area where the Nam Yao and Nam Rim meet. Nan River is a large fertile plain area that people use to produce commercial crops such as tobacco and several kinds of vegetables. The forest areas are largely degraded; some is classified as natural forest, some as community forest. In the upper catchment people have also created lychee orchards. |
| *Biggest water users*: | Nam Rim Catchment: rice farmers, dry sea son cropping; Nan River Basin: Central Plains farmers, Electricity Generating Authority of Thailand, Bangkok industrial and domestic users, upper Nan rice farmers |
| *Main income activity*: | agriculture |



## 2 Main Challenges in the Nan River Basin

The water in the Nan River is a scarce good; not enough to service all people and needs. The government has conventionally dealt with this scarcity problem through infrastructure projects such as dams, reservoirs and

diversions, which cause on-site displacement and other off-site social and environmental impacts. River-bank land (Suan Don Loum) for example is of great significance for livelihood and vulnerable to increased water flows from a diversion such as the planned Kok-Ing-Nan diversion.

State authorities tend to consider communities as local actors, capable only of managing traditional weirs, assuming the wider river basin and infrastructure management as a bureaucratic responsibility. Water is considered state property and a state responsibility. This vision is expressed in the recently established 25 River Basin Committees (RBC), with unbalanced representation between state and community/civil society representatives. There is no articulation between these new institutions and pre-existing water management such as local weir and channel irrigation systems. Also, to date the main functions of the RBCs have been heavily project-oriented, so that representatives from different parts of the basin compete for development funds rather than co-operate over water allocation.

Civil society groups fear that the centralised management and blueprint solutions will seriously undermine traditional water management systems, such as the weir and channel systems. At the community level, the main concerns are over government proposals for investment in large scale infrastructure as a serious threat to their natural resource base and hence livelihoods.

## 3 Stakeholders



Case holders: Australian Mekong Research Centre (AMRC) and the Nan Civil Society Coordination Centre (NCSCC). The AMRC works at the research/advocacy interface in close support of local partners' needs in the Mekong Region. Its mission is to provide a policy level research, analysis and capacity building resource in support of development paths that maintain the integrity, diversity and symbiosis of local livelihoods, cultures and ecosystems.

Stakeholders: NCSCC, Nam Rim Watershed network, a union between the water user group based on allocation of water from Nam Rim Weir, and communities in the upper watershed; Civil Society Organisations such as the Hak Muang Nan group; Nan River Basin Committee; governmental institutions and departments such as the Department of Water Resources.

## 4 Case-study

Noticing the increased changes in water management policies, the NCSCC grew concerned with the implications these might have on the Nan River, town and province. In order to get a better grip on the situation, the Centre started to research the local perception and practices of water management in 24 villages along the upper catchment of the Nan, an ethnically and ecologically diverse area, with a diversity of land uses and associated water management practices.

The research identified four in-depth study issues involving negotiation over water in its catchment context within and between villages, and between local and state actors. The four issues revealed a large number of conclusions on very specific water management practices in the area, thus a

locally derived and locally owned body of knowledge about water management in Nan was developed.

The increased knowledge of the area and the main preoccupations of the area's inhabitants have generated opportunities for the NCSCC to become involved in various public and academic fora. These involve river basin management, infrastructure development issues and the drafting process of the water law and the establishment of the River Basin Committees.

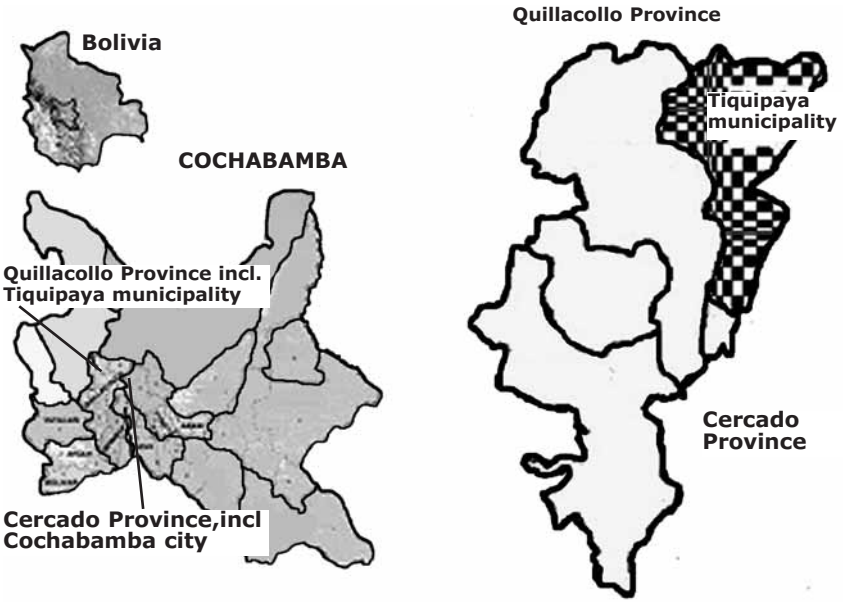
Several meetings were held among the 24 communities, which were used as a base to discuss establishment of a strengthened network involving the elevant communities and local organisations to further underpin future work on water facilitated by NCSCC.

## 5 Some Specific Conclusions from this Case-study

- River basin management on existing mechanisms, processes and values is of crucial importance. Otherwise, management arrangements imposed by state agencies will prove to be incompatible with local culturally embedded practices;
- Villagers' interest in participation arises from direct interest in outcomes, not from a standardised institutional form of participation;
- River basin specific organisations are not necessarily the most strategic points of intervention. Other key groups and networks, such as the NCSCC, may play an important role given modest resource to become involved in water and river basin specific issues;
- Research is significant as much for the process of involvement as for the nature of the results and findings. The inclusive process of study by a civil society organisation has attracted interest at community and local government level, while the report of the findings gives a legitimacy that advocacy and critique does not afford at the policy level;
- By documenting a range of ways in which water and river basin manage ment are actively negotiated at a local level, the study gives NCSCC a much more nuanced understanding of key river basin management issues. It also gives them a basis to challenge the bureaucratic approach to infrastructure planning and river basin administration currently in place as `mainstream' practice.

# Case-study 4
# The Tiquipaya Watershed at the Central Valley of Cochabamba, Bolivia

## 1 Basis Statistics




*Source map: Centro A.G.U.A.*



| | |
|---|---|
| *Total watershed area*: | 100 km$^2$, the irrigated area at the valley 1000 - 1500 ha |
| *Average annual rainfall*: | 450 mm., concentrates between December to March |
| *Description of area*: | Mountainous area with slopes to over 20%, and a major city located in the valley. 66% of the river basin is considered rural, 34% urban. |
| *Biggest water user*: | irrigation (85%), 15% for drinking water and other uses |
| *Population*: | Tiquipaya municipality: 37.791 people, Cochabamba city: 455.711 people. About 500 inhabitants in the catchment |
| *Income generating activities*: | agricultural production. |
| *Average household income*: | within 200 US$/month to 500 US$/month (2002 census) |

## 2 Main Challenges in the Rocha River Basin

The upper catchment of the Rocha River Basin is the area of water supply for the basin. Most water demand for irrigation and drinking water are in the lower, urban catchment area. The valley is urbanising rapidly, as a consequence of immigration from diverse areas of the country. Population pressure

(growing rate of 11% per year) causes an increased demand for water and land. Simultaneously, agriculture is intensifying in some areas and staying extensive in others, as a strategy to stop urbanisation.

Water-related problems are increasing. The valley is confronted with water pollution due to inadequate treatment facilities, droughts in the dry season and floods in the rainy season, an overexploitation of groundwater, and erosion and siltation because of the deterioration of the catchment area.

Plans for a new national water law keep being blocked by powerful stakeholder groups in society. The irrigation systems have established strong water rights and rules for irrigation management, but at the level of the valley (multiple users) they do not count with formalised, legal arrangements for water allocation. A collective vision to water management and the future of the region is lacking. Informal arrangement between farmers or communities and a sectoral approach by government institutions dominate water use. Lacking appropriate mechanisms to resolve conflicts, confrontations between water users are occurring regularly, such as the violent conflict over the privatisation of the drinking water company Aguas del Tunari, which led to a genuine 'water war'.

## 3 Stakeholders

*Case holder*: Centro A.G.U.A., institute for research on irrigation management and irrigated agriculture.



*Stakeholders*: Coordinadora del Agua y la Vida, a platform which co-ordinates the management of the water in Cochabamba; the organisations of water users (water supply committees); drinking water companies (SEMAPA, EPSA-MACOTI); the local government and community organisations; ASIRITIC (Asociación de Sistemas de Riego de Tiquipaya y Colcapirhua), the irrigator's association in Tiquipaya which represents six irrigation systems; CGIAB, an institutional platform interacting with State agencies and water users organisations; Fundación Solón, a non-profit organisation which works on the analysis of both land and water policies, and a bridge between the government, decision-makers and farmers' organisations.

## 4 Case-study

Centro A.G.U.A. looks at the decision-making process, water management practices, and institutional policies in Tiquipaya. It investigates the role and strategy of the different actors and water users organisations at the local level, but also looks at issues regarding policy-making and decision-making at regional and national levels. It analyses the way in which these organisations participate in the overall water management in the Cochabamba valley, and the way in which they enter in a negotiation process.

Centro A.G.U.A. supports strategy development of local communities by analysing water-related issues, and sharing information. Their relatively neutral position in the valley, and their growing knowledge about diverse aspects of the local situation, is increasingly being recognised by a wide range of stakeholders.

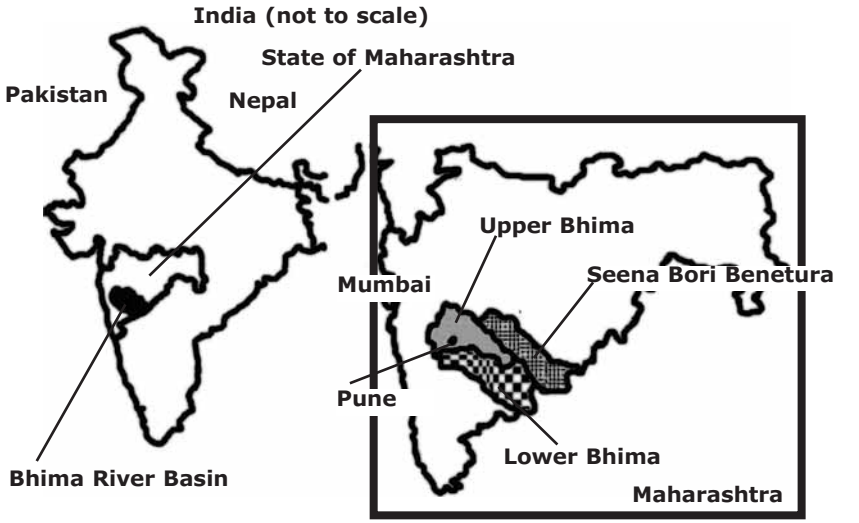
The Centro A.G.U.A. position as a centre of expertise allows them to facilitate negotiation processes (www.negowat.org) and thus open up space for local organisations, such as ASIRITIC, to effectively participate in negotiations about water allocations and investments.

## 5 Some Specific Conclusions from this Case-study

- Lack of institutional or legal arrangements for water management can lead to conflicts between water users. Such conflicts, in turn increase people's willingness to get involved in decision-making in water management. Simultaneously, conflicts can help create the appropriate space for communities and water users to effectively participate in negotiations over water management;
- Unstructured discussions lead only to violent conflicts, not to opportunities and equity for all water users;
- Centro A.G.U.A. has been successful in addressing the need of stakeholders for action research and analysis of critical issues (social and economical chances, land use planning, implications on technology, water resources development, etc), this information is becoming useful for the ongoing negotiations;
- There is a need for support other than informational support. This is the lobby of the intermediary organisation with different actors, aimed towards building consensus on a more integrated approach on both water management and watershed management, and at getting facilities for sustaining the negotiations, such as funding, support in logistics of negotiation meetings, institutional set-up, etc. This will help to achieve a high degree of commitment and participation, as a condition to establish a real dialogue with legitimacy and power for making decisions, as well as building capacities for further steps.

# Case-study 5
# Bhima River Basin, India

## 1 Basis Statistics




*Source map: Gomukh* and *Maharashtra Water and Irrigation Commission Report, Government of Maharashtra, Volume II, 1999*

| | |
|---|---|
| *Main river basin*: | Bhima River, tributary of Krishna River, length 325 km |
| *Altitude*: | Highest 1005 m.a.s.l. (Bhimashanker), lowest 457 m.a.s.l. (Solapur) |
| *Total river basin area*: | Bhima Basin: 4.8 million hectares; Krishna Basin: 30 million ha, Kolwan Valley: 8.000 ha. |
| *Irrigated area*: | 636.000 ha, which is 14% of the cultivable area in the Bhima basin, of which 4.7% is irrigated by dams and 10% through private sources by way of dug wells, bore wells and minor lifts (pumpsets) on rivers, streams etc. |
| *Area under forest cover*: | Forest area: 7.7%, Forest Cover (density >0.5[2]): 4.0%, Degraded forest (density <0.5): 3.7% |
| *Average annual rainfall*: | 2500 mm in the upper reaches, 500 mm in the lower reaches of the basin, most rain falls in the four months of the monsoon season. Kolwan Valley:1200 mm. |
| *Description of the area*: | The Bhima originates in a mountainous, high rainfall area with cliffs and steep slopes, the lower reaches are composed of moderate slopes and flat lands with maxi mum temperatures up to 45ºC. The upper basin still has prime multi-tiered evergreen forest, whereas the middle and lower reach-es suffer from deforestation and heavy soil erosion as a result. The remaining areas |

[2] Density 1= 280 trees/hectare

| | |
|---|---|
| | with fertile soil cover are used for agriculture. |
| *Biggest water users*: | Sugar cane plantations use up 60% of all public and private irrigation sources. Area under sugarcane cultivation: 124000 Ha. =19.5% of the irrigated area and 3.85% of the cultivated area |
| *Population*: | 12.33 million people (1990, 30.90 million people expected in 2030), Kolwan valley 15.000 people. Population Pune City = 3.5 Million (2001 census) |
| *Main income activity*: | Agriculture, including paddy cultivation |
| *Average household income*: | Average rural household income (2004)= Rs 30,000 (US$ 525) Average urban household income = Rs 287,520 (US$ 5030). |

## 2 Main Challenges in the Bhima River Basin

Though the state of Maharashtra has about 75% of the basin area of the Bhima and receives abundant rainfall, the inter-state tribunal award and national policy restricted Maharashtra State from using this water. It had to release this water, without obstructing it, to the riparian states of Karnataka and Andhra Pradesh in order to satisfy the water requirements of these low rainfall regions.

Mainstream policies of centralised water impounding has favoured the construction of big and medium sized dams, whereas the actual demand for water for drinking and domestic use is decentralised and dispersed. These dams have had major negative impacts on livelihoods and environmental qualities.



The inadequacy of the current planning process is so serious that more than 80% of the basin area and an equal proportion of the rural population living in villages still remain completely outside the purview of irrigation systems developed so far. Inter-basin transfer of water for example takes water from the water scarce regions of Bhima (less than 1000 $m^3$ per year per capita) to the highly surplus west-flowing coastal river basins (annual per capita availability greater than 16000 $m^3$). The majority of the water resources harvested in major to medium irrigation dams are used for irrigating sugarcane fields (in which half of the elected Members of the Legislative Assembly from the Bhima Basin hold a major political and economic interest), which constitute only 3% of the cultivable land. On the one hand, there is a severe shortage of drinking water for the majority of the rural population and on the other hand, the sugarcane fields are flooded with water. Also, 20% of the annual average yield of Bhima water is used to generate hydropower, which might cause conflicts in the near future. On top of all this is the severe deterioration in the ecological integrity of the Bhima Basin, due to pollution of untreated sewage and industrial effluents, deforestation, over abstraction by tube wells etc.

## 3 Stakeholders

*Case holder*: Gomukh, a non-governmental organisation involved in direct field interventions related to land and water issues in the Bhima Basin.

*Stakeholders*: National and regional government; local communities; NGOs, irrigation committees; Self Help Groups; private sector.

## 4 Case-study

To ensure equitable distribution of the available water resources in the river basin, the need of the hour is to initiate a meaningful dialogue between the stakeholders of the Bhima waters. Gomukh has been developing several activities throughout the basin, varying from active involvement in river basin management in areas neglected by government agencies to activities of social and environmental restoration in areas in which government interventions have had major negative impacts. For example, Gomukh has expanded the areas under organic farming by providing protective irrigation, formed 65 Women's Self Help Groups, enlarged the areas of 'Sacred Forest Groves', and created a network of paddy cultivators to enhance local production. The challenge is to integrate all seemingly stand-alone activities into one vision for the entire basin, and negotiate this vision within the Bhima Water Partnership and other relevant, government co-ordinated, institution and policy design processes.

Gomukh identifies past and ongoing initiatives in which negotiation has been a major element in decision-making, and facilitates the build-up of wider coalitions within the Bhima Basin to strengthen negotiation positions of local actors. Basically, it facilitates the enlargement of the negotiation process (outside the state of Maharashtra), allowing local negotiations to spill over into regional and eventually basin and national negotiations. The experiences Gomukh has built up in part of the basin, the Kolwan Valley, serve as a model for the rest of the basin. In the recent severe drought (2003-4), the Kolwan Valley stayed green within the further dry basin. This was the reason that the heads of all major ministries, departments, mass media persons and ex-bureaucrats attended the First Bhima Basin Multi-stakeholder Conference in April 2004.

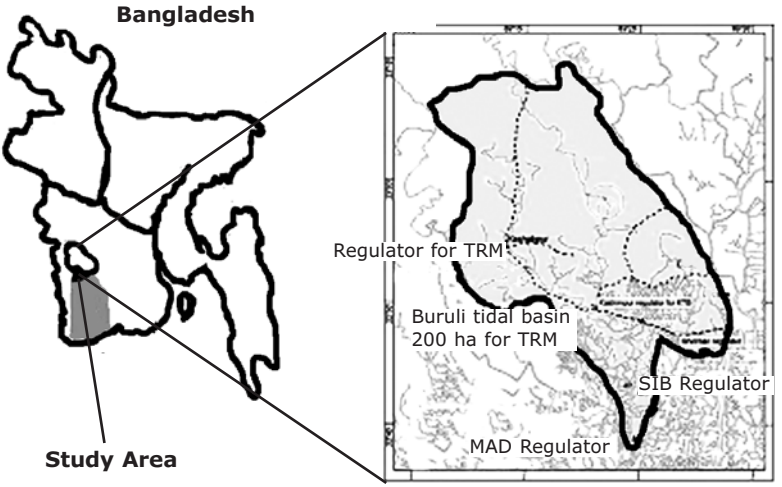


## 5 Some Specific Conclusions from this Case-study

- Since local stakeholders take part in the processes, they feel a sense of responsibility and accountability towards the created assets;
- The local negotiated approach in the Kolwan valley satisfied basic needs – water and food security, health and sanitation, and did so at a substantially lower cost and within a considerably shorter period of time than government efforts before;
- Local initiatives essentially choose development options which are socially least disruptive and which do not cause human displacement. When the situation requires it, the locally preferred option may also cause minor displacement. In such cases however the local community decides to internalise the displacement by adjusting or compensating land and water rights, or by providing access to other resources like fodder, fishing rights, forest produce, etc.;

- IRBM requires a basket of techniques that can together bring about necessary changes. Not all techniques are appropriate for the region, in this case deep wells cause groundwater tables to drop. People of the (sub)basin have discussed the problem and agreed not to bore deep wells for irrigation, a solution only effective if reached through negotiation and adopted by every inhabitant of the area.
- Natural disasters can enhance the negotiation process, such as drought in this case, with the project area being the only green area in the surroundings, which attracted officials to the negotiation table.

# Case-study 6
# The Case of the Khulna-Jessore Drainage Rehabilitation Project (KJDRP) in Bangladesh



Map of KJRP Projec Area

*Source map*: *CEGIS*

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|---|---|
| *Main river basin*: | The study area includes parts of the basins of three different rivers: the Bhadra, the Hari and the Sholmari. |
| *Altitude*: | Around 2 meters above sea level |
| *Total river basin area*: | The total study area, including the basins mentioned above, is 127.800 ha |
| *Average annual rainfall:* | 1,751 mm |
| *Description of the area*: | The project is located in the districts of Khulna and Jessore within the coastal area of Bangladesh, which constitutes one of the largest deltaic regions of the world. The water regime of the area is characterized by the saline water of the Bay of Bengal that comes in from the south through a number of tidal rivers and by the sweet water carried by rivers from the northern part of the country. For the purpose of crop cultivation polders were built to prevent salinity intrusion into the area. Fishing is an important occupation in the area, brackish water shrimp farming is common in some parts. |
| *Population*: | Over one million |
| *Main income activity*: | Agriculture, fishing, shrimp farming |
| *Average household income*: | Around US $ 800 per annum |

## 2 Main Challenges in the Khulna-Jessore Area

The polders in the districts of Khulna and Jessore (constructed in the 1960's) were quite effective in keeping the protected areas relatively free from the problem of surface water salinity, allowing extensive crop cultivation. However, the sediment that came with the tidal waters could not enter the area protected by polders anymore and got deposited on the riverbeds, lifting them. The clogging of the rivers meant that the water accumulating within the polders due to rainfall and flow of water from upstream could not easily drain out through these rivers, causing a serious drainage congestion. Vast areas were waterlogged, where agricultural activities could not be undertaken, and many homesteads were inundated.

The problem in the area caused by the waterlogging had many different dimensions. The waterlogging would affect the biophysical environment and consequently also affect the production of fish and paddy as well as the other socio-economic factors, thus being not only a physical drainage problem, but also a problem relating to sustainable water resources management in the area. The challenge is to solve the drainage problem in a manner conducive to the life and livelihood requirements of the inhabitants of the area, ensuring that the adopted measure is environmentally sustainable.

## 3 Stakeholders

*Case holder*: Center for Environmental and Geographic Information Services (CEGIS): a public trust providing the Government of Bangladesh with research support in matters relating to water resources management.



*Stakeholders*: Bangladesh Water Development Board (BWDB): the main government agency responsible for water resources management in the country; Asian Development Bank (ADB): the agency funding the project for the rehabilitation of drainage in the Khulna-Jessore area; Water Management Associations (WMAs): the institutions of the local people voicing their needs and suggestions with regard to water resources management.

## 4 Case-study

An initiative by the name of Khulna-Jessore Drainage Rehabilitation Project (KJDRP) was taken up by Bangladesh Water Development Board (BWDB) to solve the drainage problem of the area, with funding from ADB. Engineering consultants were engaged, who came up with the solution of dredging the rivers and simultaneously building a large regulator downstream of the area which would let water flow out but not in.

The people of the area, however, felt that the proposed regulator would not solve the problem and would rather aggravate the problem in course of time. Their argument was that large volumes of sediment would deposit in the southern vicinity of the regulator, thereby causing waterlogging in vast areas to the north. This prompted ADB to ask for an independent Environmental and Social Impact Assessment (EIA/SIA) of the regulator option, which was done by CEGIS.

While initiating the fieldwork for conducting the EIA/SIA, CEGIS found that the local people had an alternative option to suggest for solving the problem of drainage congestion in their area. Their preferred option was to keep the tidal rivers open and create tidal basins at appropriate locations to ensure sufficient tidal flows to keep the rivers deep enough for effective drainage of the water from the area. Finally, the BWDB agreed that this alternative option should also be considered in the EIA/SIA. The people were, however, not able to articulate their option in terms of where the tidal basin should be located or what should be the physical dimensions of it. Therefore CEGIS developed it further, with input from the Surface Water Modelling Center (SWMC), calling it the Tidal River Management (TRM) option. The EIA/SIA conducted by CEGIS concluded that the TRM option would be most suitable in solving the problems of the area in a sustainable manner.

The TRM option has now been implemented in the Hari River system. The Water Management Associations (WMAs), which were formed at an earlier stage to look after the interests of different hydrological zones within the area, would have a major responsibility in making the option a continued success. To make the whole effort more beneficial to the common people, the functioning of the WMAs with regard to managing their water resources and liasing with concerned government institutions need further streamlining. Issues like financial needs of the WMAs and mandates for operation and maintenance require to be addressed more adequately.

## 5 Some Specific Conclusions from this Case-study



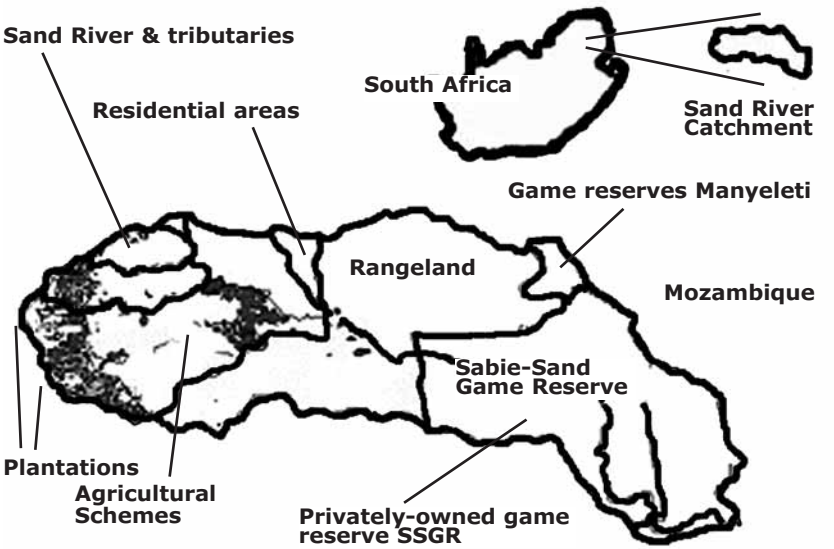
One major conclusion of the case-study is that it is important to utilize local knowledge in designing programs for water resources management. This helps in adopting a technology that is appropriate for the life and livelihood needs of the people and also sustainable from the environmental standpoint.

The case-study shows that a negotiation process pursued by community level stakeholders, which is supported by appropriate institutions, can succeed in making concerned authorities honour popular demand.

Another important conclusion of the case-study is that strong people's institutions, with appropriate mandates and adequate financial backing, need to be in place for carrying out responsibilities of managing water resources at the local level which is conducive to the welfare of general people.

# Case-study 7
# The Save the Sand Project: an Integrated Catchment Management Initiative in South Africa

## 1 Basis Statistics




*Source map: AWARD*

| | |
|---|---|
| *Main river basin*: | Sand River, a sub-catchment of the Sabie River catchment |
| *Altitude*: | 1800 m.a.s.l. to 450 m.a.s.l. |
| *Total river basin area*: | Sand River sub-catchment: 1910 km², Sabie catchment: 7096 km² |
| *Irrigated area*: | 2583,1 ha (4.05%) |
| *Area used for forestry*: | 11927,3 ha (6.25%) |
| *Average annual rainfall*: | Varies from 2000 mm to 550 mm over a very short distance of 80 km. Intra-seasonal drought is common. |
| *Description of the area*: | The majority of the Sand catchment falls into the lowland savannahs and is severely degraded. The source is situated in a humid mountainous region, with little natural and mostly planted (pine tree) forests. The bottom part of the catch-ments houses privately owned game reserves and a national park. |
| *Biggest water users*: | Irrigation and forestry (47% and 16% respectively) |
| *Population*: | 400.000 people |
| *Main income activity*: | Commercial activities, tourism (Kruger National Park), forestry, agriculture, civil service posts |
| *Average household income*: | About US$ 50 a month. |

## 2 Main Challenges in the Sand River Basin

Due to the history of apartheid and the large displacements of people into the catchment area, population densities are extremely high (up to 300 people/km$^2$). In the dry catchment are people have limited access to arable land and water resources. Gross inequities exist between water for the rural poor and for sectors such as tourism, agriculture and forestry.

New policy instruments (National Water Act, 1998, Water Services Act, 1997) refer at an ideal state where all residents of a catchment are in a position to negotiate water allocations and resolve resource-based conflicts in an equitable way. The new policies include explicit protection of the right to water for people and a minimum environmental reserve.

However, the current social situation and human capacities in the Sand River Catchment inhibit the implementation of an integrated and participatory approach to the management of the Sand. Communities have been historically divided by apartheid policies, and participation in resource management was virtually non-existent. There is still a large gap between policy and practice.

## 3 Stakeholders

*Case holder*: AWARD, Association for Water and Rural Development, a non-profit organisation that promotes and supports equitable and accessible community water services and resources in the Sand River Catchment.



*Stakeholders*: Numerous focus groups and their associated clusters of individuals, these include: local government, traditional leaders, water committees, DWAF (Department of Water Affairs and Forestry) extension officers, the Bushbuckridge Water Board, Community Development Fora, and schools.

## 4 Case-study

The Save the Sand Project (SSP) is a national pilot project for Integrated Catchment Management and Land Care, supported by the national government. The SSP includes many activities related to the management of the catchment, such as the restoration of degraded areas and the development and implementation of rainwater harvesting techniques. One of the main tasks of the SSP is to facilitate participatory development and implementation of the management of the Sand Basin.

After developing a preliminary management plan, the SSP now informs, builds capacity and creates interest of all actors to participate in the planning process and to negotiate their views and needs with other actors. One of the major elements of the project is the development and implementation of a methodology that creates the capacity of all stakeholders to actively participate in the management of the Sand, and which may be replicable in other areas or projects that set out to develop and implement river basin management plans in a truly participatory way.

AWARD facilitates a number of priority groups of actors that have a critical role to play in the implementation of Integrated River Basin Development principles in the Sand Catchment.

Each group has the opportunity to a) articulate their own vision and practice in relation to river basin management, and b) negotiate their vision and implications for their vision amongst themselves. Currently, SSP is supporting the creation of the Sand Catchment Management Agency, in which 14 representatives of different stakeholder groups will be nominated.

## 5 Some Specific Conclusions from this Case-study

- The Ecosystem Approach offers a useful framework for strategic choices regarding land and water use practices in the catchment. Local people already often think in systems;
- Negotiation must hold the possibility of real power for those involved – otherwise it stands simply as a token for 'community involvement'. Details of involvement and negotiation, such as who, when and why, must be identified and communicated in order to make participation meaningful;
- The intermediary based in the area can change practice and meanings of communities and people;
- A national obligation to adopt IRBM remains nothing more than an intention until it is given meaning at the local level through implementation.
  A too ambitious law or act makes no difference in daily practice if active implementation is not sought.