

UNEP Collaborating Centre on Water and Environment

**UCC-Water**



**Roadmap Case Book:**

**Experiences from Developing National  
Roadmaps for Integrated Water Resources  
Management**

**September 2007**

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# 1 Introduction

The availability of freshwater, both in terms of quantity and quality, is severely limited in many parts of the developing world. This has a negative impact on the possibility of achieving broader societal goals, for instance, poverty reduction, health improvements and environmental sustainability. Improved water management is essential for such goals and consequently the World Summit for Sustainable Development (WSSD) in Johannesburg in 2002 adopted a target to, “develop integrated water resources management and water efficiency plans (IWRM Plans) by 2005 with support to developing countries. IWRM is an internationally acknowledged framework for water governance and can be defined as, *“a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare, in an equitable manner without compromising the sustainability of vital ecosystems”*<sup>1</sup>.

A survey of the progress towards this WSSD target was presented by Global Water Partnership (GWP) at the 12<sup>th</sup> meeting of the Commission for Sustainable Development (CSD-12) conference in April 2004. The survey estimated that about half of the more than 100 countries included in the survey had only just started the process of formulating plans for improvement of water resources management. While at the CSD-13 conference the following year, it was recognised that considerable progress was being made, it was clear that many countries still had a long way to go.

Consequently, it was decided that steps needed to be taken to further assist those sub-regions and countries lagging behind in preparing such plans. The IWRM 2005 programme responded to this need, by providing assistance to governments upon request, in order to achieve the “Acceleration of the implementation of the IWRM 2005 target ensuring that environmental aspects are adequately incorporated in the strategies/roadmaps produced to achieve this target”.

This objective was to be achieved by assisting countries through sub-regional meetings and training courses or directly upon request in devising and drafting individual “roadmaps” that outline activities necessary for the transition from an IWRM vision to an IWRM plan. Assistance was given in the form of financial and technical support, with Danida<sup>2</sup> as the key financing partner. The sub-regions involved were South East Asia, Central Asia, Southern Africa, Central Africa, West Africa, North Africa, the Caribbean, and Central America, as well as two South American regions (Andean and Cone). As part of the programme, a total of 58 countries participated in a detailed survey aimed at assessing the status of IWRM in respective countries (see annex 1). A total of 19 individual countries were supported directly in developing national IWRM roadmaps of which eight have been selected for this casebook.

The point of departure for the 2005 programme was the establishment of, or involvement with, sub-regional networks interested in IWRM related activities in Africa, Asia and South America. In particular, focus was placed on sub-regions, including shared basins; and thus institutions responsible for water resources

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<sup>1</sup> Global Water Partnership (2000): Integrated Water Resources management, GWP TEC Background Paper no 4 ( [www.gwpforum.org](http://www.gwpforum.org) )

<sup>2</sup> Danish International Development Agency

management at sub-regional level. As part of the ongoing work programmes of the sub-regions, national-level assistance was provided to selected countries.

The following section (2) covers an outline of the objectives and processes involved in making the roadmaps; detailing how the roadmaps are designed to support the IWRM planning process. Section three seeks to capture the experiences of the countries involved in the programme by highlighting the key outcomes and lessons learnt. A total of eight case examples are used to help illustrate these experiences (see table 1 below).

**Table 1: Case studies**

Country & Case Title	Case Description
<b>Argentina:</b> Building consensus on a national IWRM process	The importance of reaching concurrence in a federal country where independent jurisdictions (states) have original domain over water resources
<b>Cambodia:</b> Multi-stakeholder drafting of National IWRM strategies and roadmaps	How the process of developing the roadmap brought stakeholders together and opened up lines of communication
<b>Columbia:</b> Steps towards building an IWRM process	Addressing weaknesses in the management framework to promote sustainable water resources development
<b>Grenada:</b> Drawing a roadmap towards IWRM	When IWRM was being built into the national water policy, the value of broad stakeholder involvement was recognised
<b>Kyrgyzstan:</b> Building an IWRM process using existing structures	Appreciating the strengths and potential of experience sharing with existing management frameworks
<b>Lesotho:</b> Creating a participatory platform for an integrated approach	How establishing a strong foundation with common understanding is critical for building and sustaining momentum
<b>Liberia:</b> Supporting the IWRM process after 14 years of civil crises	Promoting the sustainable management of water resources is key to improving socio-economic conditions
<b>Philippines:</b> Working together to secure sustainable water for all	Facing up to need for holistic water management built on consideration of equity, the environment and economics

Section 4 consists of the eight country case stories, together with an opening note briefly describing both their relevance and structure.

The intended audience of this case book is the policy makers and managers who can benefit from the experiences gained during the course of the programme. More specifically, the intention is that it will assist them in understanding some of the most common problems experienced in IWRM planning, as well as the options for overcoming them. Much of the material produced by the programme has been made publicly available on the UCC-Water website.

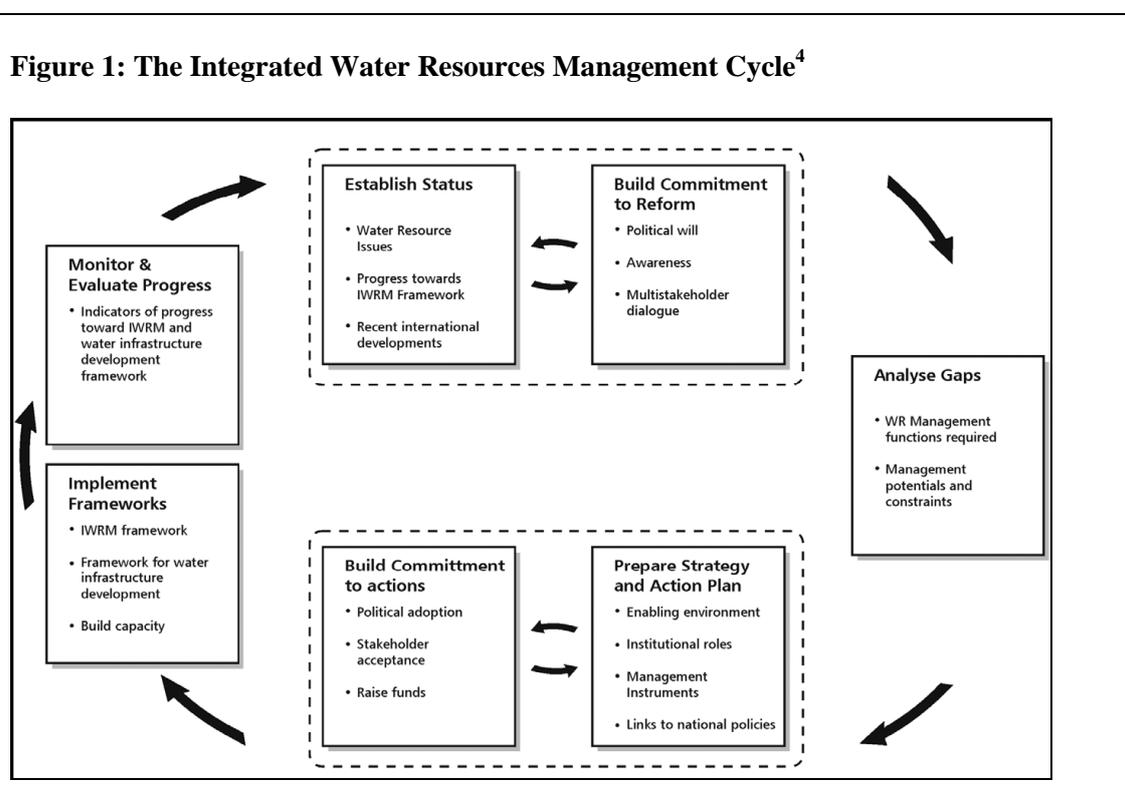
## 2 Roadmaps towards IWRM

The target for “developing integrated water resources management (IWRM) and efficiency *plans* by 2005 with support to developing countries” was adopted by the UN World Summit for Sustainable Development in 2002 in Johannesburg. In recognition of the difficulties many countries have been experiencing in IWRM planning, UNEP initiated a support programme in 2005 in order to accelerate the implementation of the IWRM 2005 target.

The preparation of “IWRM plans”<sup>3</sup> has been perceived as a difficult process in many developing countries. Therefore, an informal process of developing roadmaps that comprises of practical short and long term actions for moving towards IWRM implementation was introduced. Hence, roadmaps were conceived as a pragmatic, step-by-step approach to IWRM reforms in countries where IWRM concepts are newly established.

A roadmap is a tool to accelerate IWRM implementation, with the exercise focused on the process leading from a vision about IWRM to an actual IWRM plan.

In figure 1 (below) the IWRM process is illustrated as the “Integrated Water Resources Management Cycle”. The cycle starts with the planning processes and continues into implementation of the frameworks and action plans and monitoring of progress.



<sup>3</sup> According to Global Water Partnership (GWP), an “IWRM Plan” is perceived as a dynamic framework that will encourage better planning and decision-making on an on-going basis.

<sup>4</sup> From GWP (2004) TEC No. 10, p. 19-22

- **Establish Status and Overall Goals.** The starting point of the IWRM process is the critical water resources issue seen in the national context. Chart the progress towards a management framework within which issues can be addressed and agreed and overall goals be achieved.

- **Build Commitment to Reform Process.** The political will is a prerequisite and building or consolidating a multi-stakeholder dialogue comes high on the list of priority actions. The dialogue need to be based on knowledge about the subject matter and awareness raising is one of the tools to establish this knowledge and the participation of the broader population.

- **Analyse Gaps.** Given the present policy and legislation, the institutional situation, the capabilities and the overall goals, gaps in the IWRM framework can be analysed in the light of the management functions required by the urgent issues.

- **Prepare Strategy and Action Plan.** The strategy and action plan will map the road towards completion of the framework for water resources management and development and related infrastructural measures. A portfolio of actions will be among the outputs, which will be set in the perspective of other national and international planning processes.

- **Build Commitment to Actions.** Adoption of the action plan at highest political levels is the key to any progress and full stakeholder acceptance is essential for implementation. Committing finance is another prerequisite for taking planned actions to implementation on the ground.

- **Implement Frameworks.** Taking plans into reality poses huge challenges. The enabling environment, the institutional roles and the management instruments have to be implemented. Changes have to be made in present structures and building of capacity and capability also taking into account infrastructure development need to take place.

- **Monitor and Evaluate Progress.** Progress monitoring and evaluation of the process inputs and outcomes serve to adjust the course of action and motivate those driving the processes. Choosing proper descriptive indicators is essential to the value of the monitoring.

For the IWRM 2005 programme, the national roadmap exercise focuses on the process leading from a vision about the future development related to water resources use, conservation and protection to the actual IWRM plan. Roadmaps are concerned with accelerating the IWRM process from the IWRM status towards building commitment, analysing gaps and preparing a strategy and action plan. They were developed to support the above process by providing a framework for both posing and identifying answers to the following questions:

1. **Where is the country in the IWRM planning process?**
2. **What are the constraints to the planning process?**
3. **Which actions should be taken to reach the IWRM plan?**
4. **What will the actions require?**

An IWRM roadmap is not usually intended to be an IWRM plan. However, as can be seen from the case studies in the book, the roadmap development process can result in a roadmap with sufficient stakeholder support and operational detail to be used as a plan. The fact that some countries chose to use the roadmap concept differently to suit their individual circumstances should be welcomed..

## **2.1 Where is the country in the planning process?**

### **Where is the country in the planning process?**

The entry point is to assess where the country is in the IWRM planning cycle. This is a first step to be able to identify the planning constraints and the specific actions needed in order to accelerate the formulation and implementation of an IWRM strategy and plan.

At this point the key questions are:

- Which are the major water resources management and water issues challenges? (status)
- Which are the short- and long-term goals for development, the associated water management and the water issues to be addressed? (vision)

A key entry point should be water governance issues: *“the range of political, social, economic and administrative systems that are in place to develop and manage water resources and the delivery of water services at different levels of society”*, which is important because it is what enables better decision making on an ongoing basis on all aspects of water resources development, management and use.

Alternatively, an entry point could be focusing on specific water challenges associated with development goals. This type of “problem-based” approach more readily leads to an action strategy based on tangible and immediate issues and can help win broad public support.

Regardless of the initial approach, roadmaps should ideally go beyond the actions needed to solve only current problems or to achieve immediate objectives. They should aim at institutionalising changes that will promote more strategic and coordinated decision-making on an on-going basis.

## **2.2 What are the constraints to the planning process?**

The next step is to assess which factors control the pace of the planning process. Here, various constraints may be identified at different levels.

The immediate constraints are usually related to lack of awareness, understanding and political will, as well as lack of capacities.

Examples of constraints:

- Awareness – and priority – at the political level of water issues is limited.
- Local government lack capacity to manage pressures on water resources.
- Investments in the water sector are low, and do not get sufficient attention in the national budgeting procedures.
- Information and data to support sound management of water is generally lacking.

Behind such immediate constraints one will often find major challenges related to the fundamentals of IWRM - “the three pillars”. The *enabling environment* of appropriate policies, strategies and legislation for sustainable water resources development and management; the *institutional framework* through which the policies, strategies and

legislation can be implemented; and the *management instruments* required by these institutions to do their job.

Flawed demarcation of responsibilities between actors, inadequate coordinating mechanisms, jurisdictional gaps or overlaps, and the failure to match responsibilities with authority and capacities for action are all major sources of difficulties with implementing an IWRM approach.

### **2.3 Which actions should be taken to reach the IWRM plan?**

The next step is to assess what actions are needed to deal with the constraints and to move forward in a realistic and pragmatic way.

Although it is logical that creation of policies and institutional frameworks should precede the use of specific management instruments, the steps are not fully sequential in the real world. Parts of the later steps may be started before policies, laws and organisations are in place. Institutional change, requiring new legislation, is typically a time consuming activity. It is often better to start somewhere, working as far as possible with existing arrangements, rather than waiting for the more wide-ranging reform measures to be enacted.

Change can be difficult and is often resisted as it makes people feel insecure even if they understand the need. Often good laws or revised procedures can fail as they are not understood or accepted by officials or citizens. Institutional reform needs to be implemented with a participatory and consultative approach, involving the formal and informal sectors, to develop understanding and ownership of the change process.

For the development of roadmaps to accelerate IWRM implementation it may be advisable to focus on the above mentioned immediate constraints. Therefore, priority may go to actions related to

- Detailed problem assessments and knowledge base development
- Awareness campaigns
- Capacity building
- Information sharing and resource mobilisation

While each country must decide how to prioritise actions - depending on its current situation and what it wants to achieve in the future - experience provides some basic lessons:

- Trying to initiate too many projects too quickly can provoke resistance. A more effective approach is to decide on priorities and a measured sequence of actions to suit those priorities.
- Avoid unrealistic proposals that might be good ideas, but have a very limited chance of success (e.g. something that is not politically or socially acceptable).
- Raising awareness, sharing information and meaningful participatory debate are key elements of any reform process.
- IWRM reform is a dynamic, iterative process and the only certainty is change itself.
- Give priority in the short-term to actions that are relatively simple to implement and help develop impetus for change through quick and visible gains.

## 2.4 What will the actions require?

Once target areas for change have been broadly identified, the challenge becomes mapping out a more detailed plan for action (= the actual roadmap). This involves examination of:

- What is feasible given the current political, economic and social context?
- What types of change should be prioritised? Do some changes need to happen first to make others possible?
- What are the relative costs and benefits between various change options?
- How do the changes work together as a mutually reinforcing package?

In determining the order for change, it is advisable to think in terms of short-, medium- and long-term objectives. After screening actions for feasibility, the next step is to look at their relative merits - in terms of political opportunity, economic efficiency, environmental sustainability and social equity. Ideally, action packages should consist of measures that complement and reinforce each other and work well with existing policies and institutions. Indeed, part of the reform process may be aiming to improve policy coherence.

A roadmap can comprise a table of grouped “actions” within different categories (e.g. awareness raising, capacity building, stakeholder mobilisation) with overall related information on objectives, timeframe, responsible executors and source of financing<sup>5</sup>. Furthermore, for each “action”, a short 1-2 page project outline may be developed comprising the following key information:

- *Action*
- Objectives
- Rationale (background)
- Approach
- Timeframe
- Responsible executor
- Expected outputs
- Costs (necessary resources - internal/external)

## 2.5 How to conduct a roadmap process?

The question here is how to move from the idea of developing a roadmap to actually creating one? What is the process and who are involved? The issue is very country specific. However, a general outline that has been helpful in many cases is proposed in table 2.

**Table 2: A roadmap process with stakeholder participation**

Roadmap	Process	Stakeholders
Step 1	<i>Assessment</i> of IWRM status and vision; constraints to IWRM implementation; and actions needed	Broad involvement
Step 2	<i>Draft formulation</i> of roadmap including	Management team

<sup>5</sup> A roadmap example from Kyrgyzstan including short project outlines may be downloaded as presented in Annex 1. It illustrates the approach mentioned. Activities relate not only towards preparation of IWRM planning, but also to IWRM implementation activities more broadly.

	short project outlines	
Step 3	<i>Consensus</i> building and support	Broad involvement
Step 4	<i>Final draft</i> roadmap including short project outlines	Management team
Step 5	Roadmap <i>authorised</i>	Government officials
Step 6	Roadmap <i>promoted</i>	Government and donors

A suggested break down of roles and responsibilities in formulation of a roadmap:

- **National government** has a lead role. It is the ‘owner’ of the process, and it mobilises funding and provides the macro-economic policy framework.
- **A Steering Committee** guides the process. It is usually high level officials, which mobilises support across sectors. It guarantees quality output and monitors implementation progress.
- **Management team** manages the day-to-day roadmap development. It is a group of qualified professionals who deal with implementation and capacity building
- **Facilitating institution** with a broad involvement including for example national NGOs, the private sector, academia, the media and regional and country partnerships. It provides a platform for dialogue, information sharing and advice.

To be effective, the roadmap development must balance two often-conflicting demands. They must win broad-based support from stakeholders to be effectively implemented. But they should not fall into the trap of endless consultation at the expense of action. The key to balancing these demands is to ensure broad participation by diverse stakeholders in a well-organised, time-bound fashion at appropriate stages of the process and include mechanisms for conflict resolution.

However, it should be recognised that building stakeholder support and participation for the development of integrated water resource management is a continuous process, not one that simply stops when the initial strategy is completed.

## 3 Working towards IWRM

This section covers the key outcomes and lessons learnt from the IWRM 2005 programme, as exemplified by the eight cases within this casebook. It is hoped that policy makers and managers conducting similar work can learn from the experiences gained during the course of the programme to the benefit of themselves, the organisations they work for, and the people they are trying to serve.

### 3.1 Key outcomes

The key outcomes of the process of developing the roadmaps as part of the IWRM 2005 programme have been:

1. **Networks supported and enhanced:** Existing sub-regional and national networks important for the long-term success of IWRM have been utilised and supported (e.g. such as ECOWAS and GWP regional networks). And in some cases, new networks and organisations have been established or even re-established (e.g. the ad hoc committee in the Liberia). These networks have been used as a vehicle to help introduce and establish the IWRM approach and the roadmap process. In turn their status has been further enhanced as organisations that have a clear purpose and an important role to play in water resource development.
2. **Capacity built:** Almost all of the stories in the case book make some reference to how the process of developing the roadmap contributed to national education and awareness. More importantly still, this capacity building relates not only to government institutions but also to civil society. Furthermore, participation in the various training and experience sharing seminars has positively contributed to national processes. This is particularly true in the cases of Lesotho, Grenada and the Philippines, where the establishment of a common understanding is seen as being the key to sustainable solutions.
3. **National reports and roadmaps prepared for 19 countries:** These reports and roadmaps not only contain details of why and how sustainable water resources management must be achieved, as well as the important next steps towards the agreed goals. They have also been instrumental in establishing; 1) common agreement on key issues that need to be addressed (rather than only the symptoms), as in Philippines; and 2) baselines on management and resource status from which progress can be measured, as noted in Cambodia. While it has never been the intention of the IWRM 2005 programme for the roadmaps to substitute IWRM Action Plans, in both the Liberia and the Kyrgyzstan cases, for example, it is noted that if no Action Plan was developed, the roadmap would probably have sufficient support and operation detail for implementation purposes.
4. **Progress tracked and reported:** A bi-product of the programme has been the completion of the most detailed survey of the status of IWRM planning and implementation in developing countries ever to be carried out. Indeed, many of the 58 countries from 10 global sub-regions used the questionnaire that formed the basis of the survey as a means of establishing the status of water

resources management in their country. However, the survey not only provides a country and regional status, but also a baseline for measuring future progress at a later date; as well as for the identification of priority areas for both the individual countries and the donor community to focus efforts and assistance. Findings from the survey have already been shared with the international community at the 4th World Water Forum in Mexico 2006, and World Water Week in Stockholm in both 2006 and 2007. The methodology of the survey has also provided important input to the IWRM indicator development work being undertaken under the UN World Water Action Programme and the outcome is one of the key inputs to the official UN-Water status report on IWRM prepared for the UN Commission on Sustainable Development (CSD-16).

### **3.2 Lessons learnt**

Many lessons have been learnt during the course of the programme. Amongst the most interesting is the importance of:

- 1. Local ownership:** The Cambodia case highlights the importance of localising work as much as possible so as to maximise the dissemination of knowledge and resulting impact. In this case all the local workshops were conducted in the Khmer language. In Liberia, after some initial help from external consultants, the country was both encouraged and felt emboldened to take complete ownership of its roadmap and draft water policy, as well as the implementation processes. This was partly due to the programme using time and effort to train government staff. However, beyond knowledge-sharing, capacity building, and ensuring sufficient support, an additional noteworthy benefit of localising the project as much as possible was noted in the comparatively low cost of the work.
- 2. Experience sharing:** Countries at similar stage of development, with similar water issues and with broadly similar cultures can benefit from experience sharing. The value of learning from other implementations of IWRM plans, both generally and regionally, is noted in the case from Argentina where lessons from neighbouring Brazil were found to be of direct relevance. Work in Central Asia included the joint drafting of a synthesis report, policy dialogues and awareness raising work between Kyrgyzstan, Uzbekistan and Tajikistan. This work helped to act as a catalyst to the opening of discussions regarding transboundary water issues.
- 3. Linking into other processes, plans and projects:** Every country has a long history of water management that needs to be understood and appreciated in order to maximise the benefits and impacts of introducing IWRM. Just as importantly, when formally introducing IWRM processes to a country it is critical to establish the content, status and potential of existing processes, plans and projects. For example, when work with Grenada started, the country was in the process of establishing a national water policy; and Lesotho was in the middle of a long term water sector improvement project. In both these instances the time and effort used in establishing the current status allowed the roadmap process to get off to the best possible start. Furthermore, in order to

promote continued reform, it is valuable to establish relationship with future processes, plans and projects. For example, this has been done in the case of Liberia, Togo and Cote d'Ivoire, where a European Union funded project will support IWRM plan development and implementation.

- 4. Participatory processes:** Participatory processes tend to be much longer and much more arduous than non-participatory ones. As noted in the case of Columbia, different stakeholders have different visions and different needs. However, as exemplified by the Philippines case, taking the time to involve a broad range of water related stakeholders creates a shared perspective of IWRM that can result in better grounded, long term solutions. The right kind of participation allows everyone (not just government) to come with their concerns. And as these cases help to demonstrate, people will also often come with serviceable solutions to their concerns. Encouraging participation also helps to activate people. For example, in Grenada the poor needed to be taught why they should care about IWRM. Participation ensures ownership, support and success. And as noted in the Argentina case, while momentum can be difficult to build up, it can also be difficult to stop.
- 5. Adaptable approaches:** While the primary objective of creating IWRM roadmaps is very clear and concrete, the process requires flexibility that takes into account local conditions and requirements in order try to ensure sustainable reforms. For example, as already noted in section 2, while it was not initially the intention of the IWRM 2005 programme to facilitate IWRM plans, in many instances sufficient stakeholder support and enthusiasm resulted in roadmaps with sufficient operational detail to be used as a plan, or the as a . The fact that some countries chose to use the roadmap concept differently to suit their individual circumstances should be welcomed.

## 4 Case stories

The cases collected below have been selected with the objective of illustrating the process and outputs of the IWRM 2005 programme. The intention is that these cases will assist others in understanding what went on, with a view to understanding some of the most common problems experienced in IWRM planning, as well as the options for overcoming them.

The case studies have been produced in a common format to allow for easy comparison, with the following themes considered:

- **Problems** of water resources management that need to be addressed
- **Context** in which the problems and solutions need to take place
- **Decisions and actions taken** in order to execute the roadmap process
- **Outcomes** of the decisions and actions taken
- **Lessons learnt** that will be of value to others involved in similar situation
- **Relevance of the case to IWRM** i.e. how the case exemplifies the problems and solutions associated with IWRM
- **Contacts and references** to be used if more information is required

## **4.1 Argentina: Building consensus on a national IWRM process**

### **Abstract**

Argentina submitted its first IWRM plan, the National Federal Plan of Water Resources, during the National Congress of Water in Tucumán, on May 16<sup>th</sup> 2007. This plan is based on an agreement among jurisdictions<sup>6</sup> and sectors for the definition of actions aimed at improving the water availability, in amount and quality, at managing and having influence on the demand, and at mitigating extreme impacts. Therefore, the Federal Water Council (Consejo Hídrico Federal (COHIFE)), which consists of the water authorities of the Provinces and the Autonomous City of Buenos Aires and the National Subsecretariat of Water Resources (Subsecretaría de Recursos Hídricos de la Nación (SSRH)), agreed on the basis for the development of the National Federal Plan of Water Resources (Plan Nacional Federal de Recursos Hídricos (PNFRH)) during the year 2006, and took actions intended to the consolidation of it in the year 2007.

This process concluded with a first version of the plan, which combines the planning efforts of the jurisdictions with the basic input of the local stakeholders that had to balance the requests of each basin, from its local, provincial, regional and national situation. An extensive process of consultations, involving 20 provincial, six regional (clusters of provinces) and one national consultation workshops was carried out to establish consensus on the plan. This plan should be understood as a continuous process that firmly began in 2006, was consolidated in 2007, and should be continuously improved in the future by all the jurisdictions in the country. The consensus reached on different topics such as drinking water, erosion control, irrigation and drainage, flood management, among others, maximises the possibility of adhesion to the plan and the implementation of these water policies within the different jurisdictions. The overall water policy statements have been agreed on. Now, whether they become sound and effective tools for water management depends on the commitment of the authorities responsible for applying them and updating them in the future.

### **Problems**

Water management in Argentina has a political and institutional structure with particular characteristics that make it different from the other countries. The federal nature of its political organisation is particularly shown in the constitutional definition on the provinces' original domain of natural resources. Within this context, the agreement reached in 2003 between most of the provinces and the nation on the Governing Principles of Water Policies, was a significant step forward. These principles are the foundations to adapt the existing norms and institutions, sharing a common vision for the water management in the entire country, and considering the hydrographic basin as the basic planning unit.

As regards the hydrological characteristics, Argentina has a great variety of climates and a varied geography: a vast Atlantic coastal region, with marine richness; a

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<sup>6</sup> The term "jurisdictions" refers to the 23 provinces, the autonomous city of Buenos Aires and the federal government

mountain range – Los Andes – to the west, which is remarkable not only for its mining potential and having the highest peaks in the American continent, but also for having permanent glaciers and continental ice; vast plains in the central/middle east (Argentina's Pampa), suitable for agricultural activity; valleys with agriculture with irrigation and important agribusiness activity; step arid plateaus in the south, appropriate for the breeding of sheep, exploitation of wind power, oil and natural gas. The great variability of eco-regions, shaped by the abundance or shortage of water resources determined, throughout the Argentinean history, changes in the population distribution, giving rise to the occurrence of big agglomerations with 90% of urbanisation rate. The supply of water resources can be expressed as an average flow of around 26,000 m<sup>3</sup>/s. Although this figure may seem generous, it is necessary to clarify that the spatial distribution is unbalanced, 76% of the country is arid or semi-arid, having average rainfalls lower than 800 mm per year. In this context, the main water issues are: floods and droughts, pollution, irrigation, sanitation, energy, navigation and climate change, among others.

The results of the national event of May 2007 enabled the identification of problems per region:

- Northwest Region (Provinces of Salta, Tucumán, Catamarca and Santiago del Estero): shortage of water, squandering of water, floods and droughts, conflicts between uses or between users, pollution of the resource, and needs for prevention of other risks.
- Littoral Region (Formosa, Chaco, Santa Fe, Misiones, Corrientes and Entre Ríos): low coverage of drinking water and sanitation, pollution of superficial and underground resources, inefficient management of underground resources for lack of knowledge, floods, inefficient use of water for irrigation, conflicts between water uses and users.
- Cuyo Region (La Rioja, San Juan, San Luis and Mendoza): shortage of water for human consumption in border towns, squandering of drinking water, river floods, impact on river flow management by hydroelectric power production, conflicts between uses or jurisdictions or due to environmental impacts.
- Central Region (Buenos Aires, Autonomous City of Buenos Aires, Córdoba and La Pampa): poor quality of the water in the Northwest region of the Pampa plains, shortage of coverage in sanitation networks and treatment plants, floods in rural and urban areas, diffuse pollution due to agrochemical products, industrial pollution and pollution due to urban settlements, overexploitation of underground water, inefficient use, and degradation of wetlands.
- Patagonia Region (Neuquén, Río Negro, Chubut and Tierra del Fuego): shortage of coverage of drinking water networks and sanitation, risk of loss of water source flow, need for prevention of risks due to extraordinary events or to climate change, pollution of water resources, conflicts between uses or jurisdictions or due to environmental impacts.
- National level: management based on insufficient hydrological information, conflicts and inefficient use in inter-jurisdiction basins, floods and pollution due to inappropriately located activities, management developed with insufficient human resources and equipment.



Fig. 1: Maps of Argentina

Table 1: Characteristics of Argentina

Physical data	
Area (km <sup>2</sup> )	2,766,890
Irrigated land (km <sup>2</sup> )	15,500
Total internal renewable water resources (IRWR) per capita (m <sup>3</sup> /year)	7,274
Total water withdrawal per capita (m <sup>3</sup> /year)	822
Total withdrawals as a percentage of IRWR (%)	11
Water used by sector (Agr/Ind/Dom) (%)	75/9/16
Socio-economic data	
Population (mill) (2006)	40.3
GDP (USD per capita) (2004)	15,200
Urban population (% of total)	89.9
GDP composition by sector (Agr/Ind/Ser) (%)	9/36/55
Labour force by occupation (Agr/Ind/Ser) (%)	NA

Sources: EarthTrends; CIA World Factbook; UNDP Human Development Report (all 2007).

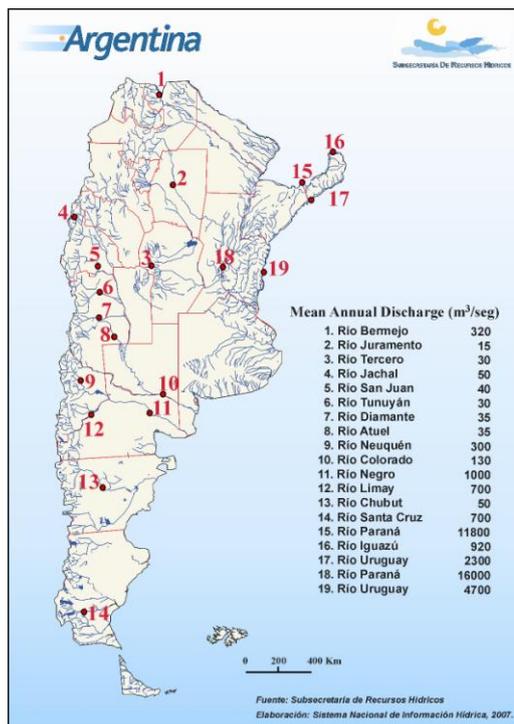


Fig. 2: Mean Annual Discharges Regions



Fig. 3: COHIFE

### Decisions and actions taken

The IWRM 2005 programme was implemented through the Sub-secretariat of Water Resources of the Ministry of Federal Planning, Public Investment and Services, building on activities during 2006 and 2007 to establish a national IWRM plan. This Plan is based on an agreement among jurisdictions and sectors for the provision of actions aimed at improving the provision of water, in amount and quality, at managing and having influence on the demand, and at mitigating extreme impacts, considering the premise that water is an element that is vital for the development of life. From the institutional vision, water is taken as structuring for the implementation of sector policies, considering water planning in each one of the jurisdictions, and at a basin level as is defined in the Governing Principles of Water Policy.

The main *activities* under the IWRM 2005 programme were the following:

- 2006:  
Development and consensus building of the basic document for the development of the National Plan
- 2007:  
February-March 2007: Provincial, regional and national workshops<sup>7</sup>:  
- Twenty provincial workshops, led and coordinated by the provincial representatives of COHIFE were carried out. More than seven hundred people related to water resources, coming from provinces with very different conditions, from arid regions to wetlands, from big urban areas to small rural towns,

<sup>7</sup> With co-financing from UCC-Water

participated in these workshops. Representatives of productive sectors, users, managers, service providers, representatives of City Councils, NGOs, and higher education and research institutions also took part in the workshops.

- Subsequently, five regional workshops were carried out according to the organisation of COHIFE. These workshops were organised with the coordination of the National Sub-secretariat of Water Resources.
- Finally, and closing the process, a national workshop was carried out at the head office of the National Ministry of Federal Planning, Public Investment and Services in order to gather the results of the Provincial and Regional Workshops, constituting basic input for this National Federal Plan of Water Resources. These workshops facilitated an exchange of experience on the management of water resources and contributed to the joint definition of main issues and immediate possible actions to be taken.
- In commemoration of the National Water Day (March 31<sup>st</sup>), the closure of the process event was carried out and the outcome/results obtained were presented with the participation of national and provincial authorities, international experts and experts linked to the management of water resources. Besides, the experience that led to the development of the Brazilian National Plan of Water Resources (2006) as an important regional point of reference for our process was also presented.

April 2007: Approval of Roadmap 2007

May 2007: Presentation of the National Federal Plan of Water Resources in the National Congress of Water.

## Outcomes

The concrete outcomes of the Argentinean programme activities comprise:

- Sub-regional *synthesis report* including national sections with focus on challenges, constraints, opportunities and action needed for IWRM planning and implementation<sup>8</sup>
- National *assessment on IWRM progress*<sup>9</sup>
- National *policy dialogue and awareness raising* at all administrative levels, and IWRM learning-by-doing with participation of many different stakeholders (20 provincial workshops, 5 regional workshops and one national workshop were conducted)
- Completed *IWRM national roadmap*<sup>10</sup>
- *Needs assessment and further actions to implement the IWRM reforms* as identified in the national roadmap

The roadmap covers the period 2007

- *Activity 1:* Definition of the Inter-organisation Work Groups and Processing Groups. Result/Outcome: work group constituted (at provincial and national-federal level) *Period:* April-May
- *Activity 2:* Processing of available information and proposals of the work January-March 2007 (i) More specificity in the final problems, better analysis of the obstacles of solutions and in actions (ii) Definition of immediate actions. *Results:*

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<sup>8</sup> UCC-Water (Nov. 2006). Report for South America.

<sup>9</sup> Filled-in questionnaires are included in the sub-regional report: UCC-Water (Nov. 2006). Report for South America

<sup>10</sup> Roadmap is included in the national report: Subsecretaría de Recursos Hídricos (April 2007). National Water Resources Plan; Activity report.

*proposal for immediate actions to be included in the Provincial Plans and in the National Federal Plan. Period: June-August*

- *Activity 3: Workshop/workshops of consolidation of proposed immediate actions. Results: agreed immediate actions Period: September*
- *Activity 4: Awareness Campaign. Results: Involvement of different organisations in the development of the National Federal Plan. Period: April-December*
- *Activity 5: Implementation of the Information System. Results: Information on the process System. Period: April-December*
- *Activity 6: Development of the National Federal Plan, version Dec. 2007, considering the provincial plans and agreed immediate actions. Results: National Federal Plan Version Dec. 2007. Period: October-December*
- *Activity 7: Specific activities in execution. Results: National Networks, prioritised inter-jurisdiction Basins, Analysis of climate change impacts. Period: April-December*

### **Lessons learnt and replicability**

Among the lessons learnt from the IWRM 2005 programme implementation in Argentina are the following:

- It is of great importance to look for inspiration from other implementations of IWRM plans in general and, particularly, in the region. The case of Brazil is a relevant reference for the Argentine process and future steps to be followed.
- A participatory process means a “bottom-up” method that strengthens the backing of the plan for its implementation phase, particularly important in a country where the water belongs to the provinces (and the Autonomous City of Buenos Aires).
- This kind of participatory process provides also a place for all other stakeholders (besides governmental) to bring their concerns and ideas about water planning, otherwise ignored.
- The development of a plan in this way has led Argentina to strengthen the water institutions, in particularly the COHIFE, as a place for discussion between the different jurisdictions.
- At provincial level, the process was mimicked resulting in the starting of the developing of the provincial IWRM Plans.
- Participatory processes take much longer than non-participatory ones. This must be taken into account when the “roadmap” process is designed. Although Argentina has not been able to agree on a long-term strategy yet (because it needed more time), the present product is a consolidated one that can lead the path to the definite Plan that should be ready by December 2007.
- The inertia of the process is sometimes difficult to overcome, but once the “momentum” has built up it is also difficult to stop it and the process itself becomes a self-fuelling engine. At present, the representatives of the different stakeholders are all motivated and want to continue building the Plan. It is the responsibility of the Government not to abandon them, keeping the “momentum” flowing.

### **Relevance of case to IWRM**

- The Argentine case is a very special one with a federal state domain of the water resources. The planning of water in this inter-jurisdictional manner can be an example to countries that want more participation at the “root” level, and where

their organisation (Central or Unitarian) does not require to plan with the inclusion of all stakeholders and all jurisdictions.

- The process which considers previous applications (as Brazil's) can show two successful cases, improving and interacting between them. Both countries have considered trans-boundary issues related to IWRM and they can act jointly, creating space for synergies, at regional levels to fully define and implement IWRM regional strategies.
- This case can be shown as an example on how to overcome the difficulties inherent to a participatory process in an inter-jurisdictional and large country. In three months, twenty provincial workshops, with a total of more than seven hundred participants, five regional workshops, and a national one (this one, with over one hundred representatives), contributed to consolidating all the work in a first version of a national IWRM Plan. This task was done in a country with twenty four different jurisdictions and distances to the capital up to 2500 km. This could be done because of the international commitment, shown in the external finance of the process, added to the national pre-existent need, and will, to manage the water resources in accordance to IWRM principles.

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- Fabián López, Sub-secretary of Water Resources of Argentina  
[falopez@minplan.gov.ar](mailto:falopez@minplan.gov.ar)
- Andrés Rodríguez, National Director of Water Resources.  
[arodrig@isrh.unc.edu.ar](mailto:arodrig@isrh.unc.edu.ar)
- Javier Pascuchi, National Coordinator of Watersheds Management.  
[jpascu@minplan.gov.ar](mailto:jpascu@minplan.gov.ar)
- Silvia Rafaelli, Adviser in charge of 2007-IWRM Workshops.  
[rafaelli@ssdnet.com.ar](mailto:rafaelli@ssdnet.com.ar)
- Santiago Reyna and Gustavo Villa Uría, Advisers in charge of the edition of the Plan. [santiagoreyna@gmail.com](mailto:santiagoreyna@gmail.com) [gustavovillauria@yahoo.com.ar](mailto:gustavovillauria@yahoo.com.ar)
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- Henrik Larsen, Regional Coordinator, UCC-Water. [hel@dhigroup.com](mailto:hel@dhigroup.com)

## **4.2 Cambodia: Multi-stakeholder drafting of national IWRM strategies and roadmaps**

### **Abstract**

Floods and droughts are a severe constraint on development and poverty alleviation in Cambodia. At present, there are still few cases of direct competition for water, but there is an important aspect of conflict between the use of watercourses for waste disposal, and other uses that require uncontaminated water, particularly domestic water supply. The Ministry of Water Resources and Meteorology (MOWRAM) was established to “foster the effective management of the water resources in Cambodia”. However, there is not a coherent body of water-related law, regulatory instruments, or policy, and the implementation of laws is generally weak. Inter-agency relationships tend to be uncooperative, although MOWRAM has reached formal agreements with several ministries to delineate responsibilities. The Government is devolving responsibilities to provincial and more local levels. However, water resources management capacity (especially at sub-national levels) is limited, and capacity building, physical facilities, operational funding, and human resources development will continue to be required in MOWRAM, other water-related institutions, and the public service as a whole.

For the IWRM 2005 programme, UNEP provided guidelines and coaching on strategy making in IWRM, but all activities were implemented by Cambodian stakeholders in the Khmer language. Activities focused on: i) an assessment of the present water resources situation; and ii) drafting of an IWRM Strategy and Roadmap. The strategy document “Integrated Water Resources Strategy and Roadmaps in Cambodia” aims to synthesise directions identified in national plans and strategies and add a basin dimension, and to promote the approach of Integrated Water Resources Management (IWRM). The water sector roadmap identified specific implementation targets for 2010. A total of 41 detailed outcomes were defined. By placing the responsibility for the drafting of the IWRM Strategy and Roadmap directly with the national apex body in Cambodia, the political and administrative impact of the outcome was maximised, while manning the drafting task force with multi-departmental representatives created an opportunity to establish mutual acquaintances and contacts between ministries and departments. The approach has been low-cost, not least because it was implemented with very limited direct international technical assistance. By using local language, a wide number of stakeholders have been involved without language barriers, ensuring both local relevance and local ownership.

### **Problems**

Development and management of water resources in the Kingdom of Cambodia have long been recognised as one of the main thrusts in the economic and social development of the country.

- Floods and droughts are a severe constraint on development and poverty alleviation and a bad year like 2000 can cause huge economic losses, disruption and loss of life. A structural approach to flood mitigation would be in-affordable and would probably be disastrous for the Mekong-Tonle Sap fishery and ecosystem. A strategic approach is needed that combines structural and non-structural means of mitigating the impacts of floods, dry spells and droughts, and

assists the rural community – particularly in non-irrigable, rain-fed areas – to respond to extreme conditions without being plunged into indebtedness.

- At present, there are few cases of direct competition for water. In the wet season, water is abundant, and the main issue is excess. In the dry season, water shortages occur in many localities, but they do not appear, at the present time, to be exacerbated significantly by competition between users. The aspect of competition that is of greatest importance is between the use of watercourses for waste disposal, and other uses that require uncontaminated water, particularly domestic water supply and fisheries/food gathering. Cambodia's health statistics are very unfavourable and contaminated water and food is a significant contributor to morbidity and mortality, particularly among children.

In the development process, the country continues its efforts to ensure harmonious development of water and related resources and smooth coordination of water resources management.

The management challenges are related to issues such as:

- There is not a coherent body of water-related law, regulatory instruments, or policy. A draft Law on Water Resources Management (WRM) is before the National Assembly, and a National Water Resources Policy has been adapted by the Council of Ministers. Several sub-sectoral policies are at various stages of development or approval, and a framework law on regulation of water supply is in draft. The legal and regulatory environment needs further strengthening to provide a secure basis for private sector participation in the water sector, and to avoid the difficulties experienced in other sectors (e.g. forests, fisheries) with property rights, licensing, revenue collection, etc. Implementation of laws is generally weak, although advances are being made.
- Several Royal Government of Cambodia (RGC) line ministries have responsibilities for aspects of water resources exploitation, while Cambodia National Mekong Committee (CNMC) deals with Cambodia's responsibilities under the 1995 Mekong Agreement. MOWRAM was established in 1999 with a mandate to manage the Nation's water resources, but attends primarily to irrigation and drainage (I&D), river bank erosion and flood control. Inter-agency relationships tend to be uncooperative, although MOWRAM has reached formal agreements with several other ministries to delineate responsibilities. Water quality management (as well as other matters) is within the mandate of several ministries as well as MOWRAM, and clearer responsibilities are needed. The RGC is devolving responsibilities to provincial and more local levels, which will require allocation of increased financial and trained human resources, to lessen reliance on non-governmental support.
- RGC capacity (especially at sub-national levels) is limited, because of the loss of an entire cohort of people during the civil war, low public sector salaries, run-down infrastructure, etc. The RGC is implementing a variety of measures in civil service and governance reform. Capacity building, physical facilities, operational funding, and human resources development will continue to be required in MOWRAM, other water-related institutions, and the public service as a whole. The successful establishment of Phnom Penh Water Supply Authority (PPWSA)

as a public corporation exemplifies what is possible, and the RGC seeks greater private sector and/or beneficiary involvement in water services provision (water supply, sanitation, hydropower, I&D).

## Context



Figure 1: Map of Cambodia (CIA World Factbook (2007))

Table 1: Cambodia

<b>Physical data</b>	
Area (km <sup>2</sup> )	181,040
Irrigated land (km <sup>2</sup> )	2,700
Total internal renewable water resources (IRWR) per capita (m <sup>3</sup> /year)	8,750
Total water withdrawal per capita (m <sup>3</sup> /year)	60
Total withdrawals as a percentage of IRWR (%)	0.4
Water use by sector (Agr/Ind/Dom) (%)	94/1/5
<b>Socio-economic data</b>	
Population (mill) (2004)	13.8
GDP (USD per capita) (2004)	350
Urban population (% of total)	19.4
GDP composition by sector (Agr/Ind/Ser) (%)	35/30/35
Labour force by occupation (Agr/Ind/Ser) (%)	75/NA/NA

Sources: EarthTrends; The World Factbook; UNDP Human Development Report (all 2007)

## Decisions and Actions Taken

Cambodia has, with support from UNESCAP<sup>11</sup> and Global Water Partnership (GWP), already initiated water management reforms. The water vision is defined as follows:

- Access for all to safe, adequate, and affordable drinking water, hygiene, and appropriate price,
- Provide sufficient water for agriculture, industry and economic activities,

<sup>11</sup> United Nations Economic and Social Commission in Asia and the Pacific

- Tackle and minimise for all the threat of loss of life and livelihood as a result of water related hazards,
- Manage the water resources to maintain an unpolluted environment

Key goals are defined as:

- Open, transparent and accountable institutions and regulatory frameworks that will promote IWRM at all levels.
- To promote economic growth through use and development of joint water resources in a manner that significantly alleviates poverty.
- To ensure equity in the allocation of water resources and services across different economic and social groups to reduce conflict and promote socially sustainable development.
- The impacts of water related hazards, particularly floods and droughts, on the lives, property and livelihoods of Cambodian People and on public property, are minimised

MOWRAM's decision to start the action was motivated by the IWRM 2005 target of the Johannesburg Plan of Implementation. It coincided with the launching of the IWRM 2005 programme in South East Asia in September 2005, and a Memorandum of Understanding (MOU) between MOWRAM and UNEP provided technical support and supplementary funding of USD 40,000. UNEP provided guidelines and coaching on strategy making in IWRM, but all activities were implemented by Cambodian stakeholders in the Khmer language.

The activities were two-fold:

i) Assessment of present water resources situation

- Establishment of a stakeholder Drafting Task Force (DTF) facilitated by the national institution responsible for reporting on the programme progress
- Collection of data for clear and transparent presentation in national language
- Convening of a stakeholder workshop on “water issues, impacts and sector causes”. The workshop conclusions formed the basis for drafting of Chapter 1 by the DTF, including specification of area focus, priority issues, their impacts and identification of the major socio-economic sector causes.
- Convening of the stakeholder workshop on “water management weaknesses and stakeholder assessment”. The workshop conclusions formed the basis for the drafting of the final sections of Chapter 1
- Stakeholder hearing of draft Chapter 1
- Finalisation of Chapter 1

ii) Drafting of the IWRM Strategy and Roadmap

- Establishment of a DTF
- Convening of one or two strategy workshops among stakeholders, where:
- The outcomes of the assessment phase were presented as background, but not for renewed discussion
- The visions and goals for the priority issues and impacts were identified
- The targets for future socio-economic sector performance were established in quantitative terms, and linked to the visions and goals

- The future performance visions and criteria for the water management reform were established
- The future roles and responsibilities for implementing the strategy are defined and assigned to the appropriate stakeholders in the public, community and private sectors
- The roadmap of the IWRM reform process is established by setting dated milestones for when future stakeholder performances must be achieved

MOWRAM chaired the two multi-stakeholder Drafting Task Forces (DTFs), staffed with people who had overview, field experience, general respect among their stakeholder group and the ability to be agents of change. The intention was to have strong voices of opposing views to look for a compromise, rather than a group of consenting voices stating the obvious. Also, one thing is to be knowledgeable about the present, another to be visionary about the future. In particular, it would be important to bring in representatives from the economic development-planning sector in these discussions to ensure future impact on general national policies. The facilitator of the DTF should be an “honest broker” to ensure a balanced and achievable outcome of the strategy.

### **Outcomes**

The strategy document “Integrated Water Resources Strategy and Roadmaps in Cambodia” by the Department of Water Resources Management and Conservation proposes general directions for development of water resources in Cambodia for the next 20 years. It is intended to lend guidance to sustainable water resource development and management in Cambodia, and is addressing all relevant stakeholders. It aims to synthesise directions identified in national plans and strategies and add a basin dimension, and to promote the approach of Integrated Water Resources Management (IWRM) within at national and basin levels. The document provides a context and broad framework for a coordinated approach. Later, it will be translated into action through a range of national and regional instruments, including the Royal Government’s Strategic Framework for Decentralisation and De-concentration Reforms, The Strategy of the Royal Government for Growth, Employment, Equity and Efficiency, National Strategic Development Plan 2006-2010, Strategic Development Plan for the Water Sector 2006-2010, National poverty reduction strategies of Cambodia .

Eight key areas in IWRM of most relevance to Cambodia have been identified:

1. Economic development and poverty alleviation
2. Environment protection
3. Social development and equity
4. Flood and drought management
5. Integration through basin planning
6. Water resources information management
7. Regional cooperation
8. Water Governance improvement

The sector analysis considered:

- Agriculture and Irrigation
- Hydropower
- Navigation

- Fisheries
- Tourism
- Domestic and industrial water supply
- Flood management and mitigation
- Watershed management

For each sector, identification was made of development opportunities and constraints; cross-sectoral opportunities and constraints; and trade-offs, as well as priority areas for investment and cooperation. Finally, the water sector roadmap identified specific implementation targets for 2010. Forty-one specific outcomes were defined with respect to water resources management.

As such, the objectives of the drafting process were achieved. Cambodia now has a strategic document outlining the multi-stakeholder tasks to be addressed to implement the IWRM approach in the national and local water management.

The future challenge will be to maintain the momentum of the strategy drafting into concrete implementation in accordance with the contents of the Roadmap. In this respect, the establishment of an efficient monitoring system of the expected strategic outcomes and impacts will be a crucial tool to ensure an actual impact of the strategy. Such a tool still needs to be developed

#### **Lessons learnt and replicability**

Lessons learnt from the IWRM2005 case of Cambodia are the following:

- By placing the responsibility for the drafting of the IWRM Strategy and Roadmap directly with the national APEX body in Cambodia, the political and administrative impact of the outcome is maximised.
- The commitment and engagement of the participants in the DTFs was most encouraging and much work was done in weekends and after office hours. This facilitated an efficient, low-cost and context-sensitive approach and demonstrated the inherent capacities available in the Cambodian water administration and user groups. Furthermore, the indigenous stakeholder involvement – and the use of national language – facilitated a learning-by-doing capacity building, as well as a strong ownership to the outcomes.
- By manning the DTFs with multi-departmental representatives, an opportunity to establish mutual acquaintance and contact was established.
- The use of national language instead of English in discussions on the complex issues of IWRM may significantly reduce misunderstandings and misconceptions among stakeholders, who have limited command of foreign languages
- The approach has been low-cost, not least because it was locally implemented with very limited direct international technical assistance. By using local language, a wide number of stakeholders have been involved without any language constraints, ensuring both local relevance and local ownership. Consequently, it was possible to reduce the input of both national and

international consultants (and their “fingerprints” in the outcomes) to an absolute minimum.

### **Relevance of Case to IWRM**

An effective co-ordination mechanism is important for IWRM. A key issue is the creation of effective co-ordination mechanisms between different agencies in order to increase co-operation and co-ordination which in turn leads to less fragmented management responsibilities and improved effectiveness of water resources management. In many cases an “*Apex*” body at the national level may be desirable for the accomplishment of IWRM. It should at least be responsible for developing policies and strategies, and for co-ordination and national planning regarding water resources.

By placing the responsibility for the drafting of the IWRM Strategy and Roadmap directly with the national apex body in Cambodia, the political and administrative impact of the outcome was maximised, while manning the drafting task force with multi-departmental representatives created an opportunity to establish mutual acquaintance and contacts between ministries and departments.

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- Mr. Thach Sovanna, Deputy Director  
Department of Water Resources Management and Conservation  
#47 Norodom BVD. Phnom Penh  
Tel.: +855 23 217 174  
Fax: +855 23 217 174  
Email: thachsovanna@yahoo.com
- Mogens Dyhr-Nielsen, Regional Coordinator, UCC-Water, mdn@dhigroup.com

### ***4.3 Colombia: Steps towards building an IWRM process***

#### **Abstract**

Colombia has a well recognised environmental institutional framework as well as an extended legislative development regarding water resources. Besides it has a rich natural water supply. Growing pressure on water availability for the different uses has shown that water resources have limits regarding both quantity and especially quality. The country has committed itself to an ambitious programme for extending coverage of drinking water services and basic sanitation provision contributing to the Millennium Development Goals. It has also been made clear that the main challenges arise from water resources understanding, administration, and operation leading to the idea of establishing a new and different relationship between society and water.

Integrated Water Resources Management (IWRM) offers an excellent approach for making a better and more sustainable use of water resources. With the initiative of the The IWRM 2005 programme, developed in coordination with IUCN South America, a National IWRM workshop was developed in order to begin a process to produce a “roadmap” towards the implementation of an IWRM plan, as was agreed during the Johannesburg summit for sustainable development. The fact that the IWRM approach to water management was included in the National Development Plan 2006-2010 offered an excellent opportunity to achieve this goal.

#### **Problems**

Colombia is a country rich in water resources. Probably due to this fact, water has been traditionally considered as an infinite resource, with an enormous self recovery capacity. This erroneous vision has led to inefficient practices for water use, especially in the agricultural sector, and to the scarce development of waste water treatment systems and facilities. Recently, however, the fast growing pressure on water resources due to anthropogenic activities and demand is changing this view. Today, main problems are found in water quality aspects, due mainly to urban and agricultural pollution, rather than water shortages. This tendency is increasing and will exacerbate these problems in the future. Furthermore, the use of the resource is also very inefficient, with large losses due to poor maintenance and primitive technologies.

The main weaknesses of the water resources management system in Colombia are the following:

1. Lack of a generalised understanding of water as a vital, strategic and limited resource that has to be shared and cared about to make it available in the future.
2. Lack of an understanding of water management based upon the hydrological cycle. This has implied lack of interest in conservation of ecosystems, waste water treatment and research and information about water resources.
3. In spite of successful institutional and regulatory developments for drinking water administration, there is a notorious lack of an integrated

management structure within all the water uses, due to a very strong sectoral approach.

4. In accordance with the above mentioned situation, there exists a lack of coordination between the different institutions with water management responsibilities.
5. Very extensive, out of date and sometimes contradictory legislation and standards.
6. Lack of institutional capacity to manage the resource, especially in the regional authorities in charge of water management.
7. Economic instruments have been included in national legislation but they are inefficient because of the lack of appropriate design and use of these instruments in water management.
8. Dominance of sectoral and private interests over public interests and priorities in water uses, which arises from the capture of environmental and other water management authorities by the regulated community, especially water users with political and economical power.
9. Lack of quality and reliability of drinking water services in small cities, towns and rural areas.
10. Lack of sewage systems, in particular in small cities and towns, and treatment facilities in large cities.
11. Unsustainable water tariff structures. It has been developed mainly for drinking water provision and is focused on financial sustainability for the operators.

There is a need to increase the importance of environmental matters in the political agenda, which is expressed by the challenges of the Environmental Vice-Ministry, where capacity issues have arisen as a result of organisational changes: The former Ministry of Environment and Ministry of Sustainable Development, have been merged into a Ministry of Environment, Housing and Territorial Development (in Spanish: MAVDT), the responsibility of housing having absorbed most of the attention of the new ministry.



Fig. 1: Map of Colombia (CIA World Factbook (2007))

Table 1: Colombia characteristics

Physical data	
Area (km <sup>2</sup> )	1,138,910
Irrigated land (km <sup>2</sup> )	9,000
Total internal renewable water resources (IRWR) per capita (m <sup>3</sup> /year)	48,557
Total water withdrawal per capita (m <sup>3</sup> /year)	228
Total withdrawals as a percentage of IRWR (%)	0.4
Water use by sector (Agr/Ind/Dom) (%)	37/4/59
Socio-economic data	
Population (mill) (2007)	44.4
GDP (USD per capita) (2006)	8,600
Urban population (% of total)	72.4
GDP composition by sector (Agr/Ind/Ser) (%)	12/35/53
Labour force by occupation (Agr/Ind/Ser) (%)	23/19/58

Sources: CIA World Factbook; FAO Aquastat (all 2007)

### Decisions and actions taken

In addition to the above mentioned institutional reforms, a new vice ministry for Drinking Water has recently been created (2006), whose functions still need to be clarified. The government included in the National Development Plan 2006-2010 (NDP), a financial and technical component intended to provide drinking water to an additional population of 3.6 million people and basic sanitation to 4 million people. This programme has been established to contribute to the Millennium Development Goals and will be developed through Departmental Water Plans. These plans are aimed at improving drinking water services administration by consolidating individual municipal systems into larger units that can be administrated more efficiently; thereby taking advantages of economies of scale. They also are based upon contributions of both national and regional financial resources.

The new government, which took office on August 2006, decided to include the IWRM as a guiding concept in the National Development Plan 2006-2010 (NDP), offering an opportunity to develop several components of the IWRM roadmap within the NDP framework. In this sense the IWRM roadmap is open for implementation within the framework and possibilities offered by the plan. Recent interest in climate change awakened by the global concern over the impacts of the phenomenon has also contributed to focus public interest in water resources, especially on the conservation of water-producing ecosystems.

Regarding public participation, Colombian legislation offers many possibilities for stakeholder participation in water management. Examples of these are public consultation in the process of licensing new projects and in water rights concession in water administration, but this advancement needs to be implemented more clearly and efficiently. The same applies to the “basin committees”, which were created in 2004, as consulting instances for the regional environmental authorities, for basins prioritised by them for land use planning and for water resources management. In response to a surge towards privatisation of water resources and services, a strong debate has been taking place, and a group of NGOs and other civil society organisations are promoting a national referendum to make water supply a basic human right at constitutional level.

As follow-up to the sub-regional workshop for the Andean Countries that was realised in Quito in November 2006 as part of the IWRM 2005 programme, support was requested and received for a national IWRM workshop in Colombia which was organised in March 2007. The goal of this workshop was to share the experiences of around forty identified national stakeholders to design a roadmap towards Integrated Water Resources Management. Participants included regional and national representatives from different governmental institutions responsible for water management in different sectors, public and private water facilities, communitarian water supply services, civil society representatives, environmental NGOs and the academic community. The workshop had an introduction explaining the IWRM concept, principles, components, and its nature as a case of environmental management. Based upon these concepts and ideas, the participants worked out a proposed roadmap integrating their own perspectives and experiences. In order to have a well organised and effective event, the national workshop was based upon a national situation analysis and a proposed set of actions to integrate a basic proposal for the roadmap.

Hence, the main national activities for Colombia under the IWRM 2005 programme were:

- Preparation of a baseline document consisting of draft situational analysis and proposed national roadmap for IWRM implementation
- Discussion of the draft roadmap by a broad range of stakeholders at a national workshop
- Finalisation of the situational analysis and the roadmap for IWRM implementation

## **Outcomes**

The integration during the workshop between stakeholders with (sometimes very) different visions and needs, was an excellent opportunity to promote dialogue for arriving at a consensus based on the inclusion of knowledge, needs and interests of all stakeholder groups.

The existence of an adequate institutional and legal framework is an important but not sufficient condition for the success of IWRM. Operational, technical and grassroots activities and competencies are a necessary complement. IWRM should be implemented through decisions and activities moving from top and downwards as well as from the base to the top. Public education about IWRM and information are therefore essential in all levels.

The result of the workshop was a “roadmap” which clearly identified the actions needed to further develop IWRM in Colombia. The roadmap should be further analysed and discussed in many fora and events, to provide the necessary public participation to generate acceptance and consensus at a wider scale.

The roadmap was organised following four strategic lines:

- Ecosystem conservation
- Demand management
- Better governance, and
- Sustainable management.

The strategic lines were developed by means of proposed actions in five thematic axes: 1) Public participation, 2) legislation, 3) research, 4) technology and information and 5) management instruments. The objectives, timing and responsible stakeholder were also identified.

There are different sources of information regarding different aspects of water resources. Integrating them to make them available to the different stakeholders was also recognised as an important need.

MAVDT is proposing a programme of seminars and meetings to introduce the IWRM concept and discuss the roadmap with several groups of interest.

It is also clear that building IWRM knowledge and training at managerial level for the various ministries and institutions involved in water administration would act as very positive support to IWRM implementation.

## **Lessons learnt and replicability**

A sound and clear baseline document and clear proposals are essential for building a sound and realistic roadmap. Also, having information, data and statistics related to water resources and its uses, is of great importance for obtaining precise and specific outcomes. Having enough time for discussion is also essential. In this case the workshop lasted for three days.

There are numerous examples of the experiences of different water users, (local communities, water companies, water users, academies etc.), based upon their needs and practices that can be considered as advancements towards IWRM. These

experiences should be collected, systematised and analysed in order to extract their lessons and with a view to replicating them in other cases making the necessary adjustments.

A similar suggestion can be made with respect to international experiences, especially about those coming from countries that have similar social and natural conditions.

A clear decision should be made for defining the roles of public and private sectors regarding water resources property and administration, and the rights of the population in relation to water services.

### **Relevance of case to IWRM**

The development of the process indicates that sharing both national and international experiences of IWRM is of very high value. The strategy of building roadmaps appears to be an excellent instrument for developing IWRM, because it integrates the different perspectives and needs of the different stakeholders and makes them visible to the rest of them.

A clear political decision to sustain a long-term process of implementing IWRM is also needed because it implies changes that need a strong backing to be achieved. These changes involve many traditions, uses and technologies that have a strong inertia, and which, unless properly explained and supported, can be very difficult to overcome.

The use of economic instruments is an essential tool for promoting IWRM implementation. Exchange of experiences regarding their design and use in different countries can be of great help.

The regional approach and compromises to foster IWRM implementation can also be a very valuable support for the national processes.

### **Contacts, organisations and references**

- Otto de Keizer, Water Programme IUCN-SUR, [otto.dekeizer@sur.iucn.org](mailto:otto.dekeizer@sur.iucn.org)
- Ernesto Guhl, National natural resources expert, [eguhl@quinaxi.org](mailto:eguhl@quinaxi.org)
- Luís Fernando Macías, Legislation expert. Email: [lufemago@maciasabogados.com](mailto:lufemago@maciasabogados.com)
- Carlos Alberto Giraldo, Urban water supply services expert, [cgiraldo@aguazulbogota.com.co](mailto:cgiraldo@aguazulbogota.com.co)
- Berta Cruz, Advisor to the Vice Minister of environment, [bcruz@minambiente.gov.co](mailto:bcruz@minambiente.gov.co)
- Henrik Larsen, Regional Coordinator, UCC-Water, [hel@dhigroup.com](mailto:hel@dhigroup.com)

## **4.4 Grenada: Drawing a roadmap towards IWRM**

### **Abstract**

Grenada is in the process of establishing a national water policy directed by a cabinet-appointed steering committee. The IWRM 2005 programme therefore came at a very opportune time and played an important role in utilising the political will to creating awareness and consensus on a roadmap for implementing IWRM as part of the national water policy. The programme comprised of a range of activities and outcomes facilitating and supporting the water policy preparation over a four-month period in early 2007: A situational analysis; development of public education and awareness-raising materials; stakeholder consultation; and preparation of a national IWRM roadmap. The value of stakeholder involvement and consensus building were realised by all parties – but also the fact that participation takes time and resources, in fact more than was available for this project. An IWRM process has been started but there is need for more.

### **Problems**

Grenada, the most southern of the Windward Islands group in the Caribbean is located between Trinidad to the south and St. Vincent to the north. The tri-island State (comprising Grenada, Carriacou and Petite Martinique) has an area of 344 km<sup>2</sup> and a population of approximately 90,000 people. Water is the most vital natural resource and its integrated management is necessary for sustainable development. However, conflicting and competing uses have resulted in water resources management issues, principally a water governance crisis in terms of securing water for people, securing water for food production, protecting vital ecosystems and gender disparities.

A number of issues and challenges are associated with water resources management in Grenada including inter alia:

- Environmental degradation affecting both surface and groundwater quality, quantity and availability;
- The need for comprehensive policy and integrated management;
- Changing and inadequate land use planning and zoning;
- Lack of coordination, cooperation and integration of stakeholders;
- Lack of education in best management practices for land and water conservation.

Additionally, Grenada is typified by a sectoral approach to water resources management with the National Water and Sewerage Authority (NAWASA), the main abstractor, given the responsibility for the management of the resource (NAWASA Act, 1990). Other Ministries, Agencies and Governmental Departments with responsibility for water resources management include: the Ministry of Agriculture in particular the Forestry Division and the Land Use Division; the Ministry of Health in particular the Environmental Affairs and Environmental Health Departments; the Ministry of Finance in particular the Physical Planning Unit. No formal arrangements for networking and collaboration among the agencies exist for the management of the resource.

In recognition of the need to manage water resources in Grenada in a sustainable manner, the Ministry of Agriculture took the initiative to develop a “roadmap”, policy and plan for IWRM at the national level, with support from the IWRM 2005

programme. The activities undertaken included stakeholder consultations and a situation analysis study which generated the requisite information to guide the “roadmap”.

IWRM roadmap development in Grenada comes at a time when the Government of Grenada is developing a National Water Policy. This process is being led by a multi-sectoral Cabinet-appointed Steering Committee, referred to here as the Water Policy Steering Committee (WPSC), which has been charged with developing a National Water Policy for the islands of Grenada, Carriacou and Petite Martinique. The work of the WPSC is being carried out under the auspices of the Ministry of Agriculture, Lands, Forestry and Fisheries.

Implementing IWRM in Grenada will involve a change in the way in which water resources are managed. The existing sectoral and piecemeal system needs to be replaced by a central coordinating agency which will be responsible for the management of water resources in a holistic manner. This will ensure that due consideration is given to the various conflicting uses and allocations of water resources. A central collaborating agency with responsibility for water resources management is necessary to execute and implement the principles of IWRM in Grenada. This will require four main elements which are:

- A holistic and comprehensive national policy and plan for the management of water resources;
- Development of the legal and regulatory framework for the management of water resources;
- Improved and developed institutional and administrative framework for water resources management;
- Enhanced capacity and capability for the management of water resources.



Fig. 1: Map of Grenada (CIA World Factbook (2007))

Table 1: Grenada characteristics

<b>Physical data</b>	
Area (km <sup>2</sup> )	344
Irrigated land (km <sup>2</sup> )	2
Total internal renewable water resources (IRWR) per capita (m <sup>3</sup> /year)	NA
Total water withdrawal per capita (m <sup>3</sup> /year)	NA
Total withdrawals as a percentage of IRWR (%)	NA
Water use by sector (Agr/Ind/Dom) (%)	NA
<b>Socio-economic data</b>	
Population (mill) (2007)	90,000
GDP (USD per capita) (2004)	3,900
Urban population (% of total)	NA
GDP composition by sector (Agr/Ind/Ser) (%)	5.4/18/76.6
Labour force by occupation (Agr/Ind/Ser) (%)	24/14/62

Sources: CIA World Factbook; FAO Aquastat (all 2007)

### Decisions and actions taken

UNEP (UCC-Water), Caribbean Environmental Health Institute (CEHI), Integrated Watershed & Coastal Areas Management (IWCAM) and the Global Water Partnership (GWP) were collaborating to assist Grenada in the development of an IWRM Policy and Plan. The WPSC, chaired by the Permanent Secretary of the Ministry of Agriculture, is Cabinet-appointed and as such must report back to Cabinet. This amounts to formal endorsement of the process of developing a National Water Policy which, if guided by IWRM planning principles, should help the country in sustainable development of its water resources.

In February 2007 a Grenada IWRM Policy and Planning Meeting was held in St. Georges, Grenada. Stakeholder representation at the meeting included:

- Ministry of Agriculture - Lands and Surveys Department; Land Use Division; Forestry Division; National Parks and Protected Areas; Pesticide Management Unit; Extension (Agronomy) Division
- Ministry of Health and Environment
- Ministry of Finance - Physical Planning Unit; Economic Planning
- The National Water and Sewerage Authority (NAWASA), Ministry of Communications, Public Utilities and Works
- Grenada Community Development Organization (GRENCODA)
- Agency for Rural Transformation
- Ministry of Carriacou and Petite Martinique Affairs
- Grenada Board of Tourism

Issues which most urgently need to be addressed by the Policy and Plan as well as their expectations were discussed. Stakeholders present agreed on the following needs and expectations:

Needs:

- More integrated management of the country's water resources.
- Safe and adequate water supply.

- Greater economic efficiency, equity and environmental sustainability in the way that water resources are managed.
- Increased involvement of stakeholders in development and implementation of a water policy as well as in IWRM.

#### Expectations:

- Building of capacity in the areas of water conservation, management, utilisation, production (including rainwater harvesting) with available assistance.
- Clarification and harmonisation of roles/responsibilities at all levels (public, private sector, civil society).
- Greater consistency between various Natural Resource Management policies, national as well as to which Grenada is obligated (e.g. Forestry Policy, RAMSAR, MDGs, SDGs, the Cartagena Convention [LBS] Protocol, others
- Proper valuation of water in all its uses (public/private debate) and a system of paying for its use.
- Proper management of data and information towards well-informed decision-making.
- Improved resource mobilisation, funding.
- Greater discipline by users and greater responsibility in water management.
- Attention to pollution mitigation in the freshwater and marine environment and public health.
- Institutional strengthening (personnel and equipment).

Immediately following the meeting, the team met with the Permanent Secretary of the Permanent Secretary of the Ministry of Agriculture to discuss how the IWRM roadmap process could assist Grenada in moving forward. The following assistance was requested and subsequently provided to the Government of Grenada:

- Assistance with Terms of Reference for the Steering Committee;
- Guidance on preparation of a National Water Policy; and
- Preparation of the Situation Analysis.

The Situation Analysis would, along with stakeholder input, form the basis for design of the IWRM Roadmap. The project team stressed the importance of developing the Roadmap as it would set out the process to be followed from time of creation of policy through development and implementation of the actual IWRM plan.

#### **Outcomes**

In the case of Grenada the Roadmap was being developed in tandem with the development of the National Water Policy as the two processes are interlinked; the situational assessment and strategic planning elements of the roadmap process are being used to inform the policy development process. The Government of Grenada expects to complete the National Water Policy before the end of 2007.

The support provided to the IWRM planning process was a multi-stage undertaking that produced the following outcomes:

- Data gathering and situational analysis to provide the necessary scientific, socio-economic data required for preparation of the National Water Policy and IWRM plan development: This was being done in two stages: 1) information

gathering using a data capture template 2) Preparation of a Situation Analysis. A total of 54 agencies were surveyed and including governmental department, non-governmental organisations, private sector agencies and community organisations.

- Development of Public Education and Awareness materials: Brochures, posters, presentations, video shorts and materials for the Government Information Service (interviews on radio and television with members of the Steering Committee) have been prepared. Products include:
  - IWRM Brochures
  - Four video shorts
  - Powerpoint Presentations
  - Two IWRM Posters
  - Reprinting of Rainwater Harvesting Posters (these were developed under a previous CEHI initiative)
- Preparation of an IWRM monitoring framework for Grenada based on the GEF International Waters indicators proposal (Duda, 2002). This document not only forms part of the contributions to the roadmap process but will be the basis on which the efficacy of IWRM planning and implementation will be gauged. This instrument will be refined through field trial and validation upon the eventual adoption of an IWRM Plan.
- Dissemination of the Situation Analysis to stakeholders – a one-day strategic planning workshop was held in the April 2007 at which the results of the analysis were presented to stakeholders (including the WPSC) and followed by discussion. Facilitation of the discussion towards reaching consensus on strategic directions for decision-making for consideration in preparation of the Policy and IWRM Plan.
- Preparation of the Roadmap and National Water Policy by the WPSC. - Formulation as shaped by the situation analysis, visioning exercise, stakeholder input, focus groups and technical stakeholder inputs and followed by IWRM Plan validation and ratification through national stakeholder workshops and policy-level input followed by formal endorsement and adoption. The roadmap was finalised by April 2007.

### **Lessons learnt and replicability**

The main lessons learnt and best practices that emerged from this planning process were:

- *Partnering:* Partnering with other agencies, activities, and organisations will help to ensure long-term sustainability of the initiative. Partnering with local groups will assist significantly in implementation and logistics.
- *Time frame:* More time is needed for the IWRM roadmap. The process should be driven by stakeholders. A 3-4 month timeframe for this process is very short and resulted in the process seeming rushed. Stakeholder involvement is an important part of IWRM. The consultative process requires time and effort and must be

flexible to be authentic and effective. In cases where government agencies have not been responsible for the project planning process (as in Grenada) the reality is that they may have previously scheduled activities or may need extra time to prepare for meetings etc.

- *Stress health and economic impacts of poor WRM:* It is important to make the link between poor management of water resources and health impacts in particular. People in affected communities as well as decision-makers are likely to pay more attention when their health is threatened.
- *Public Education and Awareness is important:* If people understand the negative effects of their activities they are more likely to want to change them, particularly if their role in mitigating impacts is described and good practices demonstrated and practiced.
- *In small island developing states the empowerment of NGOs and CBOs is particularly important:* Empowering the local NGOs (non-governmental organisations) and CBOs (community-based organisations) through the process of consultation itself as well as through the provision of information and training (capacity building) will help to ensure greater sustainability of IWRM.

### **Relevance of the case to IWRM**

Water resource management basically involves the protection of the resource so that it can be sustainably exploited by people while also providing an environmental service. Ironically, sectoral approaches to water management can often be self-defeating: Rather like the case of the “tragedy of the commons”, each sector (e.g. water supply, forestry, agriculture, waste disposal, industry etc) seeks to exploit the resource to its maximum benefit with little consideration of other users and uses that fall outside the sector’s immediate interest. As a result, the resource deteriorates meaning that, while clear solutions may not be immediately apparent, all stakeholders may ultimately suffer. Collaborative or integrated management solutions may be perceived at best as an irritating complexity, or at worst as a threat to the authority and subsequent power an individual sector currently enjoys.

In the case of Grenada, where water bodies perform numerous service functions, this is not as a result of reckless management; it is just a typical example of a sectoral approach where no formal arrangement for integrated management involving multiple stakeholders exists. One of the first tasks in initiating an IWRM approach to water resources management is to help the various stakeholders to understand; 1) that there is a problem; and 2) that collaborative management can resolve conflicts of interest in a fair manner to the long term benefit of all.

### **Contacts, organisations and references**

Sasha Gottlieb, Technical coordinator, CEHI, [sgottlieb@cehi.org.lc](mailto:sgottlieb@cehi.org.lc)

- Trevor Thompson, Land Use Officer, Ministry of Agriculture, Grenada. E-mail: [trevort\\_lud@yahoo.com](mailto:trevort_lud@yahoo.com)
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- Henrik Larsen, Regional Coordinator, UCC-Water, [hel@dhigroup.com](mailto:hel@dhigroup.com)

## **4.5 Kyrgyzstan: Building an IWRM process using existing structures**

### **Abstract**

In realisation of many water related issues and management problems in Kyrgyzstan, a Water Code reflecting an up-to-date comprehensive IWRM framework was adopted in January 2005. Its full implementation is a long term process, and the IWRM 2005 programme has been supporting the process and the transformation toward IWRM.

The programme therefore comprised of a number of activities and outputs including a national water resources assessment; a status of development towards an IWRM framework; and a roadmap towards IWRM with concrete project outlines for implementation. Key lessons learnt from the IWRM 2005 programme included good experience of building the programme on already existing organisational structures in Fergana Valley, where cooperation in transboundary water management has taken place since 1998; and the ability of the sub-regional collaboration to facilitate relevant exchange of IWRM experiences not only among the three countries participating at the national level but also among all five Central Asian countries. Furthermore, the very concrete and informal approach to IWRM roadmaps has proved practical in terms of engaging the main stakeholders in the process and to move forward the IWRM reform process in Kyrgyzstan.

### **Problems**

Kyrgyzstan is experiencing growing water resources deficiency and increasing water pollution. The water infrastructure is ageing and water use is inefficient in particular in irrigated agriculture but also in other sectors. The critical water issues are mainly associated with the sharp reduction of financing of water sector institutions, hydro-meteorological services, and nature protection agencies. There is also only a limited contribution from water users to the financing of water services and payments for water use and wastewater treatment.

The main disadvantages of the water resources management system in Kyrgyzstan are the following<sup>12</sup>:

1. The Department of Water Resources (DWR) has over a number of years mainly served the interest of irrigated agriculture, thereby neglecting the basic principle of equal and reasonable sharing of water resources between different sectors.
2. Lack of proper coordination between water related bodies; examples of duplicated authorities and unclear responsibilities.
3. Overlapping regulatory, inspective, controlling and managing functions and authorities within the same management bodies (and among identical officials).
4. Lack of human capacity in management bodies dealing with decentralisation processes.
5. Lack of appropriate attention to strategic problems of water resources protection from pollution and depletion, regulation of the supply-demand

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<sup>12</sup> According to the Kyrgyzstan national report presented in: UCC-Water/GWP (2006). Speedup of the IWRM-2005 objectives implementation in Central Asia

balance, stimulation of water saving and efficient use, development of market mechanisms for water use, improvement of participation of public and natural resources use entities in solution of the above mentioned problems, etc.

6. Dominance of sectoral or personal interests over the national interests and integrated perspectives.

The majority of the above mentioned problems are caused by the inconsistency of institutional reforms over the previous period. Measures aimed at reform were often restricted to mechanical union of management bodies and reductions in the number of staff, or replication of foreign management approaches without consideration of the Kyrgyzstan context and its specific traditions.

As a consequence of the many water related issues and management problems, a new Water Code of Kyrgyzstan was adopted in January 2005. The Water Code has a very comprehensive scope and its realisation will require both a significant amount of time and resources before becoming fully operational. Hence, it was recommended by the government to implement a number of high-priority institutional measures that will not require significant investments, but would allow the resolution of the most urgent water related problems.

The objectives of the IWRM 2005 programme for Central Asia was to promote and build capacity for IWRM planning in Central Asian countries through a regional process to assist in developing IWRM plans in those countries which were ready to start this process and requested assistance: These countries were Tajikistan, Kyrgyzstan and Uzbekistan. While Central Asia has been active in the last 10 years in introducing IWRM principles into water policies and legislation and also into national development plans and poverty reduction strategies, only Kazakhstan has taken the initiative of preparing an IWRM 2005 Plan, which was approved by the parliament in 2006.

However, in the inception of the IWRM 2005 programme in Central Asia, it was clear that IWRM 2005 planning was very complicated due to the formal approval process - in some countries even at the presidential level. The experience from IWRM planning in Kazakhstan has clearly illustrated this point. The IWRM roadmap was introduced as a non-legal document. It is perceived as less ambitious and a more direct means of keeping a stimulating dialogue between stakeholders and at the same time moving the transition process towards IWRM through a prioritisation of needs and actions to fulfil these.



Fig. 1: Map of Kyrgyzstan (FAO, Aquastat (2007))

Table 1: Kyrgyzstan characteristics

Physical data	
Area (km <sup>2</sup> )	198,500
Irrigated land (km <sup>2</sup> )	10,420
Total internal renewable water resources (IRWR) per capita (m <sup>3</sup> /year)	9,200
Total water withdrawal per capita (m <sup>3</sup> /year)	2,230
Total withdrawals as a percentage of IRWR (%)	22.0
Water use by sector (Agr/Ind/Dom) (%)	94/3/3
Socio-economic data	
Population (mill) (2004)	5.2
GDP (USD per capita) (2004)	430
Urban population (% of total)	35.7
GDP composition by sector (Agr/Ind/Ser) (%)	34/20/46
Labour force by occupation (Agr/Ind/Ser) (%)	55/15/30

Sources: EarthTrends; CIA World Factbook; UNDP Human Development Report (all 2007)

### Decisions and actions taken

With collaboration from both UNDP and UNECE<sup>13</sup>, it was decided to base the IWRM 2005 programme as much as possible on existing organisational structures and regional IWRM experiences. Therefore, the programme was implemented in close collaboration with GWP CACENA<sup>14</sup> and SIC-ICWC<sup>15</sup> and the heads of national water management bodies. It builds on the national networks created under the

<sup>13</sup> UN Economic Commission for Europe

<sup>14</sup> Global Water Partnership in Central Asia and Caucasus

<sup>15</sup> Scientific and Information Centre of the Interstate Commission for Water Coordination

transboundary “IWRM Fergana Valley” project undertaken by SIC ICWC and IWMI<sup>16</sup>.

The main *activities* under the IWRM 2005 programme were the following:

- Managerial capacity building for senior representatives of key ministries and water sector institutions
- Monitoring and reporting on progress towards the IWRM 2005 target and towards the corresponding management framework in Kyrgyzstan
- Organising and conducting national and regional seminars related to IWRM planning and training for developing roadmaps towards IWRM
- Development and approval of roadmaps

A number of key national and regional seminars were conducted during the programme, stimulating in depth discussions of the national context while benefiting from exchange of regional experiences. The first regional seminar for instance, provided the platform for exchange of lessons learnt from the IWRM Fergana Valley project, and experiences from Kazakhstan associated with developing a national work plan for IWRM, and the session created the basis for building a uniform methodology of national roadmap processes.

The very concrete and relatively simple approach to developing IWRM roadmaps provided a beneficial context to involving a large number of different stakeholders. A total of 30 participants attended the first national seminar in Kyrgyzstan representing ministries, private enterprises, research institutions, basin organisations, water project representatives, etc.

In the beginning of the programme, there was a need to identify “where are we now?” in order to move in accordance with the national and regional visions to the point “where do we want to be?” For that purpose, in early 2006, national experts assessed the IWRM context following a comprehensive questionnaire format<sup>17</sup>. This review is the most recent and in depth assessments of the national IWRM stage of development.

A first version of the roadmap was discussed at the first regional seminar. The roadmap outlines activities necessary for the transition from an IWRM vision to an IWRM plan. In the initial stage, the status of the national water resources management and the main provision for the long-term programme for water resources management was assessed from an IWRM perspective taking into consideration the national socio-economic context and the national vision of water resources management. The regional seminar stressed the importance of placing focus on water use productivity, public participation, social mobilisation and training of stakeholders in IWRM. And it was decided that roadmaps include a concrete outline of planned activities and outputs supplemented with explanatory notes and rationale of the essential (short-term) activities for national IWRM planning.

The roadmap was then amended and improved and discussed during the second round of national seminars, and then submitted to the key national ministries and institutions for its official approval. After consideration of the roadmap at the second regional

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<sup>16</sup> International Water Management Institute, Colombo, Sri Lanka

<sup>17</sup> The IWRM questionnaire format was developed by DHI Water Environment Health in collaboration with UCC-Water.

seminar and presentation to the international donor agencies, the next step was to submit it to the government for decision making on the practical implementation of the proposed activities.

### **Outcomes**

The concrete outcomes of the Central Asian programme, including activities in Kyrgyzstan, Tajikistan and Uzbekistan, comprise:

- Sub-regional *synthesis report* including national sections with focus on IWRM planning and implementation<sup>18</sup>
- National *reports on IWRM progress* as an update of the GWP monitoring reports from 2004 and 2005<sup>19</sup>
- Sub-regional *policy dialogue and awareness raising* at ministerial level, and IWRM learning-by-doing at national level with participation of many different stakeholders (two regional and two national seminars were conducted)
- Completed *IWRM national roadmap including proposed project outlines*<sup>20</sup>
- *Needs assessment for support to implementation* of IWRM reforms as identified in the national roadmap
- *Capacity building* (sub-regional, integrated with ongoing capacity building activities)

The roadmap covers the period 2007-2025, addressing objectives and necessary actions, realisation time, responsible executors and sources of financing. Issues comprise actions for policy and legislative reforms, institutional and human reform and capacity building needs and needs for developing the tools to support water management.

Short term priority actions (2007-2010) have been identified and detailed in proposed project outlines including information on the objectives, rationale, actions, institutions involved and budget for national and international contribution. These project outlines have been instrumental in engaging the national government and donors in the implementation of the roadmap.

The roadmap contains activities aimed at establishing IWRM. While the roadmap therefore is not intended as a replacement of an IWRM Plan, even if IWRM Plans are not developed in the Central Asian countries, the IWRM roadmaps have provided action plans supporting the IWRM reform processes.

### **Lessons learnt and replicability**

Lessons learnt from the IWRM 2005 programme implementation in Central Asia including Kyrgyzstan are the following:

- It proved accommodating to build the IWRM 2005 programme on already existing organisational networks. National representatives involved in the transboundary IWRM Fergana Valley project were tasked to coordinate national IWRM 2005 programme activities. Furthermore, the programme implementation was supported by both national and regional seminars, which provided benefits in

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<sup>18</sup> UCC-Water/GWP (2006). Speedup of the IWRM-2005 objectives implementation in Central Asia

<sup>19</sup> Questionnaires are included in the sub-regional report: UCC-Water/GWP (2006). Speedup of the IWRM-2005 objectives implementation in Central Asia

<sup>20</sup> Roadmaps and project outlines are included in the sub-regional report: UCC-Water/GWP (2006). Speedup of the IWRM-2005 objectives implementation in Central Asia

terms of sub-regional exchange of roadmap approaches and practical IWRM experiences from the IWRM Fergana Valley project implementation.

- In the inception of the IWRM 2005 programme in Central Asia, it became apparent that developing IWRM 2005 Plans involved comprehensive preparation and a lengthy approval process. The introduction of the IWRM roadmap concept on the other hand was perceived as being more practical in terms of moving the IWRM process forward. The IWRM roadmap is not considered a legally binding document but rather an action plan describing practical steps towards IWRM; and short term priority actions (2007-2010) have been identified and detailed in project outlines, which have been instrumental in engaging national governments and donors for its implementation.
- The simple approach proved to be manageable with only limited input from international experts, and the activities and outputs were achieved in only one year with minor project costs. Furthermore, the roadmaps effectively build on available data and studies performed, and the concrete and informal process managed to engage all main stakeholders including civil society and the private sector.

### **Relevance of Case to IWRM**

In Central Asia much emphasis has been placed on transboundary water management and less on national water resources. Building national IWRM roadmaps within a sub-regional process has assisted countries in the region to acknowledge national similarities and differences, and thus, has contributed to a better understanding and appreciation of transboundary water cooperation and the importance of sharing knowledge and experience among countries in the region.

A participatory approach is the only means for achieving long-lasting consensus and common agreement. However, for this to occur, stakeholders and officials from water management agencies have to recognise that the sustainability of the resource is a common problem. Governments at national, regional and local levels have the responsibility for making participation possible. The roadmap development process managed to foster constructive dialogue between multiple stakeholders and to engage national and international funding agencies. Hence, the process has created substantial stakeholder ownership and a realistic framework for implementation of activities. Thus, several substantial benefits have emerged as a result of the roadmap process towards IWRM.

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- Mikhail Horst, Regional Consultant, Sub-regional Programme Coordinator, [horst\\_mg@icwc-aral.uz](mailto:horst_mg@icwc-aral.uz)
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## **4.6 Lesotho: Creating a participatory platform for an integrated approach**

### **Abstract**

The water resources related issues in Lesotho has prompted many initiatives and exposed the need to move towards Integrated Water Resources Management. The first step in this direction has been the creation of a participatory platform where stakeholders meet and harmonise actions and views. The stakeholders developed a strong feeling of the need for such a platform and a need to use and maintain it for mutual benefit. It was further concluded that a roadmap towards IWRM was a beneficial and clear objective for the stakeholders, and the drafting of such a roadmap was initiated following a common decision.

### **Problems**

The Kingdom of Lesotho faces a number of growing water-related problems. Many of these are interrelated, cannot be resolved in isolation, but have to be approached in an integrated manner. Though water on a broad scale is abundant, there are many problems caused by its uneven distribution and difficult access. Erosion is widespread and reduces water quality in combination with urban and industrial wastewater. The problems are aggravated by a fragmented management structure and large funding gaps. In more specific terms, the problems include:

- *Water Availability*  
Lesotho has sufficient water to meet all its demands now and in the future. In fact, water is the only natural resource in relative abundance in Lesotho. However, the availability of water varies both spatially and temporally and access is difficult in many locations. It is therefore an issue to harness and distribute the available water efficiently to support the development of key economic sectors, such as industry, agriculture and tourism, as well as for domestic purposes.
- *Erosion*  
Lesotho has the most severely degraded land on the continent. The country was once the grain basket of the region and the kingdom exported food to the neighbouring Orange Free State (OFS) and to Kimberley and the Rand to feed the thousands of diamond- and gold-mine workers. The ecological effect of the sustained and unrelenting cultivation and grasing in the Lesotho Mountains has been devastating. Soil fertility has plummeted and, more seriously, huge quantities of topsoil are simply washed away with each summer rains, ending up as silt in the rivers of the Eastern Cape.
- *Pollution*  
Polluted runoff created by 600 individual diamond miners in the mountains of Lesotho threatens the water quality of Lesotho Highlands Water Project (LHWP). The two rivers most affected, the Kao and Malibamatso, feed the Katse Dam, which delivers water to South Africa, and is an important source of revenue for the country. Scientists studying the problem predict that warmer temperatures in summer could lead to algal blooms in Katse reservoir, especially in the area of the dam's intake tower, where water is piped to South Africa.

Inadequately treated sewage and industrial wastes are some of the main sources of water pollution and are responsible for the introduction of disease causing pathogens and toxic substances into the aquatic environment. In Lesotho, as in all other countries, urban areas also generate large amounts of solid waste whose environmentally safe disposal is one of the biggest challenges to government. It is, therefore, a need to look at sanitation and solid waste management together in order to reverse the situation and/or limit risks for proliferation of disease vectors.

- *Water Supply & Waste Water Services:*  
Lesotho has experienced substantial internal migration resulting in enormous growth in urban areas over the last few years. For example, the population of Maseru alone grew from 200,000 in 1996 to just below 400,000 today (about 7% per year). This migration is mainly fuelled by rapid industrialisation. This growth has placed a heavy obligation on the Government to provide adequate water and sanitation. At present some 50% of Maseru's residents do not have access to adequate water supply, while 35% do not have access to adequate sanitation. Together the increased demand from "wet industries" (mainly textile processing) and increased demand for potable water have put a heavy demand on water supply and waste water services.
- *Droughts*  
Lesotho's vulnerability to drought means that over half the country's food must be imported from South Africa: this was particularly apparent during 2002 and 2003, when large-scale famine was narrowly averted. Droughts typically result in the failure of winter cropping and delays to the start of agricultural activities in the mountain regions, as well as shortening summer agricultural activities in the lowlands. The situation is one of chronic crisis that has a wide impact on economic and social areas. For example, outbreaks of disease caused by the consumption of stagnant water are not uncommon.
- *Weak & fragmented management*  
The country's ability to address the above problems is hampered not only by a lack of fiscal capacity, but also by weaknesses in the institutional arrangement (both in terms of organisation and capacity) and a fragmented approach to policy and plan making and implementation. (See "Relevance of the case to IWRM".)

Figure 1: A Map of Lesotho



Source: CIA World Fact Book (2007)

Table 1: Lesotho characteristics

<b>Physical data</b>	
Area (km <sup>2</sup> )	30,355
Irrigated land (km <sup>2</sup> )	30
Total internal renewable water resources (IRWR) per capita (m <sup>3</sup> /year)	2,920
Total water withdrawal per capita (m <sup>3</sup> /year)	28
Total withdrawals as a percentage of IRWR (%)	0.96
Water use by sector (Agr/Ind/Dom) (%)	20/40/40
<b>Socio-economic data</b>	
Population (mill) (2004)	2.1
GDP (USD per capita) (2004)	2600
Urban population (% of total)	19
GDP composition by sector (Agr/Ind/Ser) (%)	16/43/41
Labour force by occupation (Agr/Ind&Ser) (%)	86/14

Sources: EarthTrends; CIA World Factbook; UNDP Human Development Report (all 2007)

### Decisions & Actions Taken

The UN World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002, called for countries to craft Integrated Water Resources Management (IWRM) and water efficiency plans by 2005, and called for support to be given to developing countries to meet this target. Lesotho was one of the countries that subscribed to this call by the WSSD, which was also devised as a way to meet the Millennium Development Goals (MDGs).

In the informal survey carried out by the Global Water Partnership (GWP) published in 2006, Lesotho was one of the countries identified as not having fully developed an IWRM and water efficiency (WE) plan to meet the 2005 target. Consequently, the UNEP Collaborating Centre for Water and Environment (UCC-Water), extended support to countries in the SADC region including Lesotho to develop a “roadmap” for the creation of an IWRM plan in order to meet the WSSD target. This agreement was brokered by the SADC Water Division and facilitated through the Global Water

Partnership Southern Africa (GWP-SA), with cooperation from the office of the Commissioner of Water (CoW) in Lesotho.

In December 2006 a fact finding mission was conducted that showed that since the publication of the GWP survey there had been some progress towards the realisation of an IWRM-inspired approach. The mission also included a workshop for key stakeholders from government bodies, donor agencies and civil society. From the workshop it was established that some major activities within the Lesotho water sector aimed at adopting IWRM were currently underway. Particular note was made of the Government of Lesotho and the World Bank supported Lesotho Water Sector Improvement Project (LWSIP). The LWSIP is a US\$40.6 million and is scheduled to run from 2004-2011. As a result of discussions it became clear that efforts would be needed to ensure stakeholder participation in a process that could combine and consolidate the various initiatives.

The Commissioner of Water in Lesotho held a second workshop in February 2007 that was primarily aimed at giving key stakeholders an overview of the status of the newly adopted Water & Sanitation Policy (an update of the Water Resources Management Policy of 1999), as well as the LWSIP which are regarded as necessary in order to implement the new policy that was premised on the following goals:

- **Water Resources Management:**  
Guidelines developed for strategic action within sustainable management of the water resources embracing IWRM principles
- **Water supply and sanitation services:**  
Strategic guidelines developed within the functions of service delivery of water and sanitation
- **Water and environment:**  
Strategic guidelines for action developed regarding protection and conservation of water resources and associated eco-systems
- **Trans-boundary water resources:**  
Strategic guidelines developed for actions coordinating the management and usage of water resources with the downstream countries in shared water courses
- **Sector wide approach:**  
Strategic guidelines developed for coordinating all sectors for IWRM and service delivery
- **Stakeholder involvement:**  
Guidelines developed for involving stakeholders in IWRM and service delivery
- **Institutional arrangements and legislative framework:**  
Strategic action guidelines developed for appropriate institutional and regulatory framework of the water sector for implementation of IWRM and effective service delivery

The LWSIP includes the following strategies:

1) IWRM Strategy

The strategic approach to developing IWRM includes several key elements. Among these are public awareness on water resources management, balanced water resources use for industrial, domestic, recreational and institutional purposes, integration water quality and quantity as well as surface and groundwater and integrated catchment management.

2) Drought Management Strategy (DMS):

The DMS is being developed to alleviate the impact of hydrological and socio-economic droughts to limit water shortages and water stress to domestic and industrial users by maintaining water supply at or above acceptable minimum levels, in regional areas large enough to warrant a national response. The DMS needs to be aligned with the Climate Change Scenario that presents several management issues in Lesotho at present.

3) Water Demand Management Strategy (WDMS):

WDMS is an effort to control increasing water demand, and can be defined as a, *“Management approach that aims to conserve water by controlling demand. It involves application of selective incentives to promote efficient and equitable use of water”*. A water demand management approach is necessary to ensure water is used optimally and that wastage is avoided, and this may delay the need for investments in new water infrastructure, leaving funds for other economic activities. WDMS will recommend tools for water demand management. The proposed measures to implement WDMS include the following:

- Economic measures
- Structural/operational measures,
- Legal /institutional measures
- Awareness raising

**Outcomes**

The second stakeholder workshop noted that while the sentiments of the water demand management are good; issues of supply are also prevalent as the water supply coverage in the country, both in urban and rural settings is still to be improved. And even though some water may be saved in the urban areas because of WDMS, the planning setting of the country may prevent the water supply authority from extending supply to other areas because the fall outside the “urban” boundaries. It was agreed that this is an issue that should be addressed in the broader IWRM Strategy.

At the workshop it was indicated that in the analysis the demand that had been assessed was from the domestic and industrial sectors, while agricultural demand had not been factored in. There was concern as it is the intention of the Ministry of Agriculture to support irrigated agriculture to improve food security. This is a potential that should be included in the strategy, taking into account that irrigated agriculture uses large quantities of water. This will ensure that the strategy development is in line with the current development plans of the country.

The understanding of the need for a joint platform where all the initiatives could be linked, and critical gaps identified, became even stronger during the two stakeholder workshops. Consequently, there was general consensus among all stakeholders on the need and value of an IWRM “roadmap”. The roadmap would be used to help define what actions must be taken to ensure that strategy is translated into specific actions on the ground, based on a common objective.

In 2007, the IWRM 2005 programme assisted the Government of Lesotho in drafting a roadmap. This roadmap was discussed and further elaborated upon during a stakeholder workshop in June of the same year. The intention now is to move forwards with the roadmap’s implementation.

### **Lessons Learnt**

The key lessons learnt so far from experiences in Lesotho include:

- The importance of establishing the status of earlier and ongoing efforts ensured that the IWRM 2005 programme got off to the best possible start. The roadmap will serve as a framework on which to build and coordinate work on an agreed timetable moving towards a common objective, based on a common understanding.
- Involvement of multi-sectoral stakeholders is not only improving the transparency of the ongoing work, it is also providing an opportunity to gain valuable feedback on what needs to be done to ensure ownership, acceptability, support and in the end success.
- Added benefits of the workshops conducted to date have been the development of, management capacity through the sharing of knowledge and ideas, an increasing sense of management accountability ownership/responsibility for the plan framework and opportunities for networking and cooperation.

### **Relevance of the Case to IWRM**

Not only is the coordination of initiatives time consuming, it requires effort, negotiation and compromise. Furthermore, the benefits may not be immediately obvious; particularly given the problem of harmonising objectives and deadlines. Effective and efficient coordination needs a both a framework and a mechanism for establishing common objectives and agreeing on required action. The present case illustrates the first steps in a process towards IWRM, namely the establishment of a stakeholder forum and the platform for dialogue, involving government, civil society, academia and private sector. The benefits of moving towards IWRM in this manner has materialised through ownership, increased transparency in government water resources related operations and increased opportunities for exchange of experience through enlarged networks.

### **Contacts, organisations and references**

- E.M. Lesoma – Commissioner of Water, Ministry of Natural Resources, Lesotho, [Commwater@ilesotho.com](mailto:Commwater@ilesotho.com)
- Andrew Takewira – Senior Technical Officer, GWP Southern Africa, [andrew@gwpsa.org](mailto:andrew@gwpsa.org)
- Oliver Chapeyama – Regional Consultant, [ochapeyama@yahoo.co.uk](mailto:ochapeyama@yahoo.co.uk)
- UNEP Collaborating Centre, UCC-Water. Visit: [www.ucc-water.org](http://www.ucc-water.org)
- Jan Hassing, Regional Coordinator, UCC-Water, [jah@dhiigroup.com](mailto:jah@dhiigroup.com)

## **4.7 Liberia: Supporting the IWRM process after 14 years of civil crises**

### **Abstract**

After 14 years of civil crises, Liberia is now facing major reconstruction challenges. Promoting the sustainable management of the nation's water resources constitutes a key factor in the efforts to improve socio-economic conditions. In recognition of the many fundamental water-related issues (such as absence of a legal framework and management weaknesses), a request for support from the IWRM 2005 programme was made by the responsible ministry for water resources management at the regional meeting of the Technical Committee of Experts of the Economic Community of West African States (ECOWAS) in December 2005.

The support provided to Liberia by the IWRM 2005 programme comprised of a number of activities and outputs, including a national water resources assessment; a status of development towards an IWRM framework; and a roadmap towards IWRM with concrete project outlines for implementation and capacity building. Moreover, specific technical assistance was provided for the development of a National Water Policy for Liberia.

Amongst the lessons learnt from the IWRM 2005 programme was the confirmation of the fundamental importance of harnessing political will and commitment to ensure that development efforts can be sustained. It was also found that the sub-regional IWRM training courses provided an excellent forum for the participating countries to exchange experiences on different elements of the IWRM reform process. Participating countries involved in the coming the EU-ACP project "*Improving Water Management and Governance in African Countries through support in development and implementation of IWRM Plans*" expressed their interest for similar approaches and assistance in their IWRM processes. The very concrete and informal approach to IWRM roadmaps has proved practical in terms of engaging the main stakeholders in the process and in moving forward the IWRM reform process in Liberia.

### **Problems**

Liberia is endowed with an abundance of water resources but the proper management and planning of these remain crucial for meeting the national development priorities and goals, and for reducing conflicts between competing users. The mandates governing water resources management in the country have been fragmented across several government agencies and there is no effective enforcement of rules and regulations. The absence of a legal framework impedes the management of water resources. This legal vacuum is further compounded by various administrative, technical and political problems, not least the poor state of the Liberian economy after years of conflict. The sustainable management of the nation water resources constitutes a key factor in the efforts to improve socio-economic standards. To this end concerted action must be taken to implement integrated water resources management.

The main problems and challenges facing Liberia in terms of water resources management comprise of the following:

- Water resources management responsibilities are fragmented across several government agencies. The absence of an effective instrument for coordination in terms of a water policy, backed by a corresponding legal framework and a strong coordinating body, is one of the reasons why the quality of water is decreasing, even though Liberia potentially has substantial water resources.
- Water resources are under increased pressure from population growth, uncontrolled disposal of waste, agricultural activities, mining, logging, aquaculture and activities in other economic sectors. Upstream-downstream issues in terms of decreased water quality occur more and more frequently and urbanised areas contribute to the degradation. The degraded water quality leads to health risks as reliable water supply and sewerage infrastructure is lacking and as domestic water often is taken directly from surface water bodies. The vast and valuable productivity of the ecosystems of coastal lagoons, estuaries, deltas and mangroves needs to be maintained, not least because they are a rich source of fish protein. The largest rivers in the country are shared with Côte d'Ivoire and Sierra Leone with Liberia as the downstream riparian. This situation can create water resources issues which require international cooperation.
- The level of development of water resources for irrigation, hydropower, inland water transport and water supply and sanitation is very low - almost negligible. The potential contribution of water resources has thus not been realised, partly because water resources management is poorly organised and lacks direction and vision for the role of water resources in sustainable development. Generally, the lack of a national water policy and coherent legislation, financing mechanisms, effective institutional arrangements and capacity for planning and prioritisation are impediments to the effective management of water resources.
- The institutions relating to the water sector work according to mandates set up prior to the civil war do not have clearly established roles and responsibilities reflecting the present circumstances. In addition, there are no coherent coordination mechanisms among different water sector partners at different levels. Fragmentation and duplication of efforts are common, leading to ambiguities in responsibilities. The Ministry of Lands, Mines and Energy is now entrusted with water sector regulation. Currently, the Ministry of Rural Development is phasing out from rural water and sanitation, although there is no institution ready to take over its responsibilities immediately.
- The water sector has a serious lack of capacity in terms of human resources. Furthermore, facilities, services and systems are inadequate in institutions at the national level. At the county and lower levels there is total absence of any water resources management activity. This problem is further compounded by a lack of management information systems, maintenance, monitoring & evaluation, planning and coordination.

Against this background there is a basic need for a national water policy that can provide management direction aimed at preventing the misuse of the water resources; as well as help to develop the creation and enforcement of punitive measures against violators. A national water policy will essentially define water resources management and thereby provide a framework for the good governance of these vital resources. In addition, it will help to create an enabling environment to facilitate the efficient

private and public sector initiatives. The sustainable management of the nation water resources constitutes a key factor in the efforts to improve socio-economic conditions.

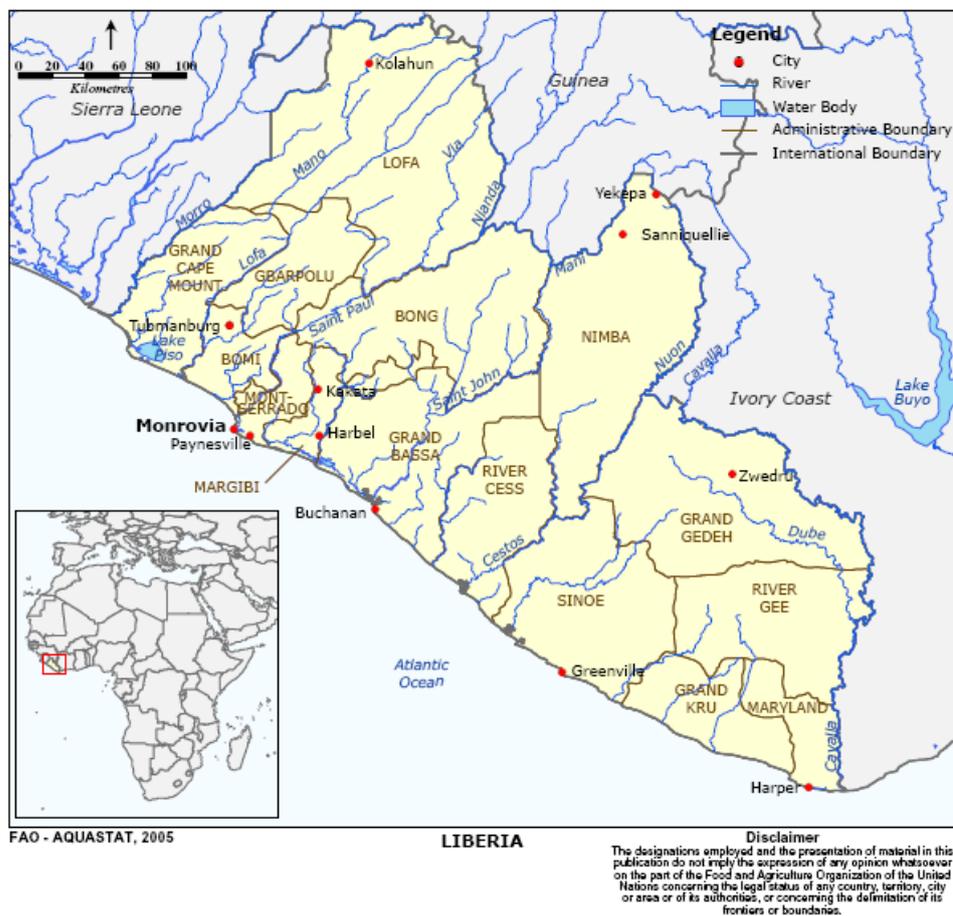


Figure 1: Map of the West Africa Sub-region and Liberia

Table 1: Liberia characteristics

Physical Data	
Area (km <sup>2</sup> )	111,370
Irrigated land (km <sup>2</sup> )	30
Total internal renewable water resources (IRWR) per capita (m <sup>3</sup> /year)	60,645
Total water withdrawal per capita (m <sup>3</sup> /year)	59
Total withdrawals as a percentage of IRWR (%)	0.1
Water use by sector Agr/Ind/Dom (%)	60/13/27
Socio-economic data	
Population (mill) (2004)	3.2
GDP (USD per capita) (2004)	150
Urban population (% of total)	57.4
GDP composition by sector Agr/Ind/Ser (%)	77/5/18
Labour force by occupation Agr/Ind/Ser (%)	70/8/22

Sources: EarthTrends; CIA World Factbook, UNDP Human Development Report (all 2007)

## Decisions

As mentioned in the introduction, the regional IWRM process was steered by the established Water Resource Coordination Unit (WRCU) under the ECOWAS (Economic Community of West African States) Permanent Framework for Coordination and Monitoring (PFCM). Thus the focus of the IWRM 2005 programme was, to a large extent, on support to the ECOWAS countries identified in agreement with WRCU, with UCC-Water working as a development partner in relation to ECOWAS/WRCU. Another key development partner has been the involvement of the West Africa Water Partnership (WAWP) under the Global Water Partnership (GWP), which has had a collaborative relationship with DHI and UCC-Water for many years. The selection of Liberia was made on request from the country upon realising the need for assistance with the IWRM process. Moreover, is among three programme countries (including Côte d'Ivoire and Togo) involved in the coming EU-ACP project "*Improving Water Management and Governance in African Countries through support in development and implementation of IWRM Plans*". This project will help to ensure the further development and implementation of IWRM plans.

## Activities and outcomes

To assure appropriate coordination of the IWRM 2005 programme one of the first actions was the establishment of an IWRM ad hoc committee hosted by the Ministry of Land, Mines and Energy. The ad hoc committee comprises of representatives from relevant Government agencies, NGOs, UN agencies and the EU. The programme was implemented through an ad hoc committee.

At the beginning of the programme, there was a need to identify the then current status of the IWRM progress in Liberia. For that purpose, in early 2006, a stakeholder meeting took place and national experts assessed the IWRM context following a comprehensive questionnaire format<sup>21</sup>. This review is the most recent and in depth assessment of the national IWRM stage of development. Based on the assessment of Liberia's IWRM status it was found that a crucial element for support, beside the overall programme activities, were specific programme assistance in formulating a National Water Policy.

The specific programme outputs and activities in Liberia comprise of the following:

- Stakeholders meeting on IWRM in Liberia, January 2006. The objective of the meeting was to discuss the status of IWRM in Liberia. At the meeting the UNEP IWRM programme and the IWRM concept and global process were presented, followed by a group discussion. The outcomes of the stakeholder meeting were the following:
  - Relevant documents were found to be already available in Liberia at water resources related ministries and sector institutions; but there was neither national water policy document nor relevant legislation, regulations or standards for water resources management in Liberia.
  - The major water resources stakeholders who attended the meeting constituted an Ad Hoc Committee to collect relevant documents and work to produce a draft Water Management Policy document that will be presented for approval by the National Legislature.

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<sup>21</sup> The IWRM questionnaire format was developed by DHI Water and Environment in collaboration with UCC-Water.

- The individual institutional policy documents at various ministries and sector institutions will be organised and made available to the Ad-Hoc Committee to be used to formulate a draft National Integrated Water Resources Management Policy for Liberia.
- Due to the fact that Liberia is just emerging from the effects of its civil war which damaged and degraded infrastructures in the water sector, the Liberian water stakeholders made request for financial support and technical assistance from the UNEP Collaborating Centre on Water and Environment to enable the Ad Hoc Committee to produce a Water Resources Management Policy document for Liberia.
- Inter-ministerial IWRM ad hoc committee established and IWRM questionnaire finalised, Monrovia January 2006.
- Draft annotated IWRM Policy outline prepared by UCC-Water. Ad Hoc Committee working meeting on draft policy outline and agreement on outline, Monrovia July 2006.
- Commitment from UNICEF and UNDP on financial support to the ad hoc secretariat, working sessions and launch of the coming National Water Policy, July 2006.
- National consultant contracted to draft IWRM policy and IWRM roadmap, with support from the ad hoc secretariat, Monrovia July 2006.
- Working session on IWRM Roadmap, September 2006.
- IWRM training course for the National Consultant funded by UCC-Water, Stockholm December 2006.
- Draft IWRM policy and roadmap prepared by National Consultant – July 2006 to May 2007. Evaluation and re-drafting of the water policy document prepared by - Water, May 2007.
- First working session on the draft National Water policy and IWRM roadmap, formal agreement on the roadmap format, May 2007
- IWRM training course for participants from Liberia, Sierra Leone and the Gambia, The Gambia, June 2007
- Second working session on the draft National Water policy and the Liberian IWRM Roadmap, June 2007.
- Finalisation of the Liberian IWRM Roadmap, July 2007
- Presentation of the Liberia case by the Hon. Minister, John G. Thomas at the World Water Week, Stockholm August 2007

The Liberia IWRM roadmap covers the period 2007-2015. It addresses objectives and necessary actions, realisation time, responsible executors and sources of financing. Issues comprise of actions for policy and legislative reforms, institutional and human reform and capacity building needs, as well as needs for developing the tools to support water management. The roadmap contains activities aimed at establishing IWRM in Liberia, and the roadmap therefore should not be seen as a replacement of an IWRM Plan, but rather as a mechanism to accelerate the IWRM reform process and implementation. However, even if an IWRM Plan is not developed in Liberia, the IWRM roadmap has provided an action plan supporting the IWRM reform processes.

### **Lessons learnt and replicability**

Lessons learnt from the IWRM 2005 programme implementation in Liberia are the following:

- Liberia is at the very beginning of the reform process towards IWRM. The political will and commitment given at highest level were proven to be essential for the implementation of the IWRM 2005 programme. Liberia is now working on the finalisation, endorsement and adaptation of the water policy and IWRM roadmap. The Minister responsible for Water Resources has stressed the importance of the formulation of a water policy to the President of Liberia and there is thus high political focus on completing and adopting the National Water Policy.
- The developed IWRM questionnaires proved to be very instrumental in assessing the National progress on IWRM, identifying elements for specific programme support, capacity needs assessment and identification of foreseen actions needed for the implementation of IWRM.
- The sub-regional IWRM training courses provided an excellent forum for the participating countries for exchange of experiences on different elements of the IWRM reform process. Moreover, participating countries involved in the EU-ACP project expressed their interest for similar approaches and assistance in their IWRM processes.
- The simple approach proved to be manageable with only limited input from international experts, and the activities and outputs were achieved in less than two years with only minor project costs. Furthermore, the roadmaps effectively build on available data and studies performed, and the concrete and informal process managed to engage all main stakeholders including civil society and the private sector.

### **Relevance of Case for IWRM**

The Liberian case clearly demonstrates that the IWRM process can be initiated anywhere in the planning cycle. Thus despite many years of civil conflict in the country and the resulting impact from such a situation, Liberia is now making progress towards the implement IWRM principles. Moreover, the case clearly stresses the importance of political will and commitment is a prerequisite for implementing IWRM.

Furthermore, a participatory approach is the only means for achieving long-lasting consensus and common agreement. However, for this to occur, stakeholders and officials from water management agencies have to recognise that the sustainability of the resource is a common problem. Governments at national, regional and local levels have the responsibility for making participation possible. The roadmap development process managed to foster constructive dialogue between multiple stakeholders and to engage national and international funding agencies. Hence, the process has created substantial stakeholder ownership and a realistic framework for implementation of identified activities. Thus, several substantial benefits have emerged as a result of the roadmap process towards IWRM.

### **Contacts, references and organisations**

- Hon. John G. Thomas, Deputy Minister/Technical Assistant to the Minister, Ministry of Lands, Mines & Energy, Liberia, [gonkanus@yahoo.com](mailto:gonkanus@yahoo.com)
- Oliver B. Kulah, National Consultant/ ECOWAS National IWRM Focal Point, [obkulah@yahoo.com](mailto:obkulah@yahoo.com)

- Jefferson W. Wylie, Assistant Director Laboratory of Hydrology, Ministry of Lands, Mines & Energy, Liberia, [jeffwwylie@yahoo.com](mailto:jeffwwylie@yahoo.com)
- Gérard Cougny, Regional Coordinator, UCC-Water, [gec@dhigroup.com](mailto:gec@dhigroup.com)
- Nick Ahrensberg, Programme Advisor, UCC-Water, [nia@dhigroup.com](mailto:nia@dhigroup.com)
- UCC-Water, Accelerate the IWRM-2005 objectives implementation in the West Africa sub-region

## **4.8 Philippines: Working together to secure sustainable water for all**

### **Abstract**

Water managers in the Philippines are faced with a multitude of severe and inter-linked problems including catchment degradation; extreme events; deteriorating water quality; increasing water stress; coastal degradation and insufficient sanitation. In the current institutional and regulatory framework of the Philippines water resources sector, there is an absence of an integrated water resources management (IWRM) system that adopts a holistic approach to sector demands. Furthermore, a major institutional problem for the sector is the multiplicity of agencies and the consequent fragmentation of water resource planning and management, and there are no cross-sectoral water resources plans to integrate various water and land use activities. However, the Government is now fully committed to water management reforms. In 2002, a water vision was established. In 2004 the IWRM approach was translated into an explicit national policy; and a national water forum with the theme ‘*Securing our future: Effectively managing water now*’ was conducted in 2004.

For the IWRM 2005 programme, a project steering committee and a multi-sectoral task force (MSTF) were constituted, and a number of activities, workshops and consultations were conducted for the preparation of the IWRM Plan Framework, including IWRM grounding and levelling sessions; consultation-workshop with non-government organisations and civil society organisations; a multi-sectoral consultation-workshop on the proposed national IWRM and water efficiency improvement plan in two provinces; and a IWRM Plan Framework launching and partners’ forum. The key outcome of the IWRM 2005 programme is the “Working together to Secure Sustainable Water for All” document, which comprises the Plan Framework for national IWRM implementation. Overall, four medium to long-term goals for the water resources management system are identified, each supported by a number of strategic themes, strategic objectives and key actions. The formation of the MSTF from different key stakeholders and institutions improved water resources inter-agency coordination and communication. And the involvement of multi-sectoral stakeholders in the process improved transparency and feedback, provided grounding and localisation of issues, and ensured ownership of the Plan Framework.

### **Problems**

Water managers in the Philippines are faced with a multitude of severe and inter-linked problems:

- Increasing water stress: Per capita water availability has been declining over the years. Assuming a high economic growth scenario and without a water resource development programme in place, the projections of water balances of major river basins shows that 17 of the 20 major river basins will experience water shortages by 2025. The river basins in Luzon will face the most serious shortages by 2025.
- Deteriorating water quality: Only about a third of river surface water areas are potential drinking water sources and most of them require complete treatment to pass drinking water standards. Data from the National Epidemiology Centre of Department of Health (DOH) indicate that 31 percent of the

reported illnesses from 1996 to 2000 are water-related. The DOH estimates a total of Peso 3.3 billion (approx. 70 million USD) annually of direct income losses and medical hospitalisation costs of the 512,527 morbidity cases and 2,978 mortality cases associated with diarrhoea, cholera, typhoid and paratyphoid and hepatitis A.

- **Insufficient sanitation:** The proportion of the population with access to adequate sanitation in 2000 is estimated to be 74.2 percent. There is a slight decrease from the 1991 coverage rate of 74.9 percent. The quality of sanitation services leaves much to be desired. Non-poor urban households rely mostly on septic tanks, which have been found to be poorly constructed and maintained without provisions for desludging, hence affecting their efficacy for primary treatment of wastewater.
- **Catchment degradation:** One of the biggest environmental challenges the Philippines faces today is the diminishing forest cover. Of the country's total forestland areas of 15.88 mill. ha., only 5.4 mill. ha. are covered with forests and fewer than a million hectares of these are left with old growth forests. Overexploitation of the forest resources and inappropriate land use practices have disrupted the hydrological condition of watersheds, resulting in accelerated soil erosion, siltation of rivers and reservoirs, increased incidence and severity of flooding and decreasing supply of water.
- **Coastal degradation:** Almost all Philippine coral reefs are at risk due to the impact of human activities; only 4 to 5 percent remain in excellent condition. More than 70 percent of the nation's mangrove forests have been converted to aquaculture, logged, or reclaimed for other uses. Half of the seagrass beds have either been lost or severely degraded, and the rate of degradation is increasing. Beaches and foreshore areas are under increasing pressures from rapid population growth and uncontrolled development, which in turn leads to erosion, sedimentation and water quality problems.
- **Extreme events and climate change:** The Third Assessment Report of Intergovernmental Panel on Climate Change (as cited by Greenpeace, 2005) indicated that extreme climate events/variability, such as floods, droughts, forest fires, and tropical cyclones have increased in temperate and tropical Asia. IPCC findings have manifested themselves in the Philippines through the more frequent occurrence of severe El Niño and La Niña events, as well as, deadly and damaging typhoons and other severe storms; floods, flash floods, landslides, drought, forest fires, etc.

The current institutional and regulatory framework in the water resources sector is the product of incremental developments over many years, each in response to particular challenges of the time. This has led to the absence of an integrated water resources management system that adopts a holistic approach to sector demands. There are some 30 government agencies and offices concerned with water resources development and management responsible with their own sectoral concerns. These agencies deal with water supply, irrigation, hydropower, flood control, water management, and other water-related concerns. For administrative supervision, these agencies are distributed among executive departments of the national government.

With such number of government agencies involved in water resources management and development, overlaps in responsibilities may be inevitable. In fact, the major

institutional problem for the sector is the multiplicity of agencies and the consequent fragmentation of water resource planning and management. There are no cross-sectoral water resources plans to integrate various water and land use activities, water quantity and quality management issues and the combined use of surface- and groundwater.

The water management challenges in the country have been identified as follows:

- Strengthen institutional structures and promote participatory water governance and supportive enabling environment
- Ensure rational, efficient, and sustainable allocation of water by balancing economic, social and environmental concerns
- Effective groundwater management and aquifer protection
- Managing and mitigating risks from water related disasters and climate change
- Promoting water conservation/stewardship and improving water use efficiency
- Securing water for people by expanding access and ensuring availability of affordable and responsive water supply and sanitation services
- Exploring new pathways to water resource management through adoption of water sensitive design and water rights trading

## Context



Map of the Philippines (CIA World Factbook (2007))

Table 1: The Philippine

Physical data	
Area (km <sup>2</sup> )	300,000
Irrigated land (km <sup>2</sup> )	15,500
Total internal renewable water resources (IRWR) per capita (m <sup>3</sup> /year)	6,090
Total water withdrawal per capita (m <sup>3</sup> /year)	811
Total withdrawals as a percentage of IRWR (%)	11.6
Water use by sector (Agr/Ind/Dom) (%)	88/4/8
Socio-economic data	
Population (mill) (2004)	89.5
GDP (USD per capita) (2004)	1,040
Urban population (% of total)	61.9
GDP composition by sector (Agr/Ind/Ser) (%)	14/32/54
Labour force by occupation (Agr/Ind/Ser) (%)	36/16/48

Sources: EarthTrends; CIA World Factbook; UNDP Human Development Report (all 2007)

### Decisions and Actions Taken

The Government is fully committed to water management reform. In 2002, a water vision was established, and in 2004 the IWRM approach was translated into an explicit national policy. The Medium-Term Philippine Development Plan (MTPDP) for 2004-2010 provides for the adoption of a more integrated and holistic management of water resources such as the Integrated Water Resources Management (IWRM) approach. This approach involves the coordinated development and management of water, land, and related resources within hydrological boundaries, to optimise economic and social welfare without compromising the sustainability of vital ecosystems. A National Water Forum with the theme '*Securing our future: Effectively managing water now*' was conducted in 2004

To ensure organisational alignment to the evolving IWRM strategy and policy, the National Water Resources Board conducted a Strategic Planning and Management on Integrated Water Resources Management, a capacity building initiative of UN ESCAP to lay the groundwork for IWRM implementation in the country. The World Water Day 2005 Symposium was a follow-up activity to the 2004 National Water Forum. The symposium aimed to create strong awareness about water problems, promote improved water resources management, provide updates and assess progress on the multi-agency Action Plan agreed upon during the 2004 forum.

### The UNEP IWRM 2005 Programme:

In January 2006, the programme commenced implementation in the Philippines. The project aims to accelerate IWRM implementation in the Philippines through the development of a National IWRM and Water Efficiency Improvement Plan.

A Project Steering Committee was constituted to provide general guidance, support and ultimately, approve the plan. The Project Steering Committee is the NWRB composed of the five secretaries of ministries/departments, the Director of National Hydraulics Research Center-University of the Philippines, and the Executive Director of the National Water Resources Board.

A Multi-sectoral Task Force (MSTF) was likewise constituted to act as the core group that will undertake the preparation of the plan. The members of the MSTF are representatives of government agencies, non-governmental organisations (i.e. Philippines Water Partnership, Water Commons Institute and Streams of Knowledge) and an academic institution (UP-NIGS).

A number of activities, workshops and consultations were conducted relative to the preparation of the IWRM plan:

- Grounding and levelling sessions for the Multi-Sectoral Task Force (April 2006)
  - IWRM Strategic Framework meeting
  - Institutional mapping workshop
- Core Group Workshop (June 2006)
- Consultation-Workshop with Non-Government Organisations and Civil Society Organisations (June 2006)
- Multi-sectoral Consultation-Workshop on the proposed National IWRM and Water Efficiency Improvement Plans in Visayas and Mindanao (August 2006)
- Participation in the Southeast Asia Regional IWRM 2005 Meeting in Rayong, Thailand (September 2006)
- Facilitation of thematic meetings and drafting workshops by the different MSTF sub-groups to finalise the Philippine IWRM Plan Framework (October-December 2006)
- IWRM Plan Framework Launching and Partners' Forum (January, 2007)

### **Outcomes**

The key outcome of the IWRM 2005 programme in the Philippines is the document “Working together to Secure Sustainable Water for All”. The document comprises the Plan Framework for national IWRM implementation.

The IWRM Plan Framework is a directional plan. It is intended to guide the different stakeholders involved in water resources management, at different levels, to either prepare their respective IWRM plans, update/enhance their existing IWRM related plans or make IWRM an integral part of their development plans/programmes. It provides a clear roadmap and a collaborative platform for all stakeholders and water-related agencies to effectively work together to achieve water for all in a sustainable, equitable and ecologically-balanced manner.

The directional Plan Framework also seeks to enable and encourage a wider adoption and localisation of IWRM, across different stakeholders, at different levels. It will guide water related government agencies and other stakeholders in ensuring that water and IWRM are mainstreamed and integrated in their respective plans, programmes, and projects. It will likewise be the take-off in the preparation of regional and local IWRM Operational and Action Plans.

The National IWRM Plan Framework is not just another water plan. There are key differences between the IWRM Plan Framework and a traditional Water Plan. The IWRM Plan Framework has the following distinctive features:

- A broader focus: It looks at water in relation to other dimensions needed to achieve larger development goals and meet strategic water related challenges

- Dynamic and adaptive: It provides a framework for a continuing and adaptive process of strategic, integrated and coordinated action in all levels.
- Integrated and holistic: All the different uses of water are considered together. Water allocation and management decisions consider the interrelationships and effects of these various uses. They are not viewed purely from a sectoral or project focus.
- Multi stakeholder engagement and involvement in all stages and key processes: Includes government agencies, non government organisations, private/business sector, academe and civil society organisations working in the areas of health, environment, energy, finance, agriculture, education, tourism and disaster management

Overall, four medium to long-term goals (outcomes) for the water resources management system were identified. These goals reflect the development aspirations for IWRM, and would ensure water resources sustainability.

The **Goals** are the following:

- Improved Effectiveness, Accountability, and Synergy among Water Related Institutions and Stakeholders
- Effective Protection and Regulation for Water Security and Ecosystem Health
- Sustainable Water Resources and Responsive Services for Present and Future Needs
- Adaptive and Proactive Response to Emerging /Future Challenges

Each of the goals is supported by a number of **Strategic Themes**. A strategic theme is either a sectoral or cross-cutting imperative that is necessary to achieve the desired outcomes. The strategic themes under a particular outcome are mutually reinforcing and are inter-dependent. Nine strategic themes were identified to support the four sustainable outcomes. Each strategic theme is supported by several **Strategic Objectives** and each strategic objective is supported by several **Key Actions**. These key actions are major steps or initiatives required to accomplish the said strategic objectives. The specific activities and their respective timeframes are not indicated. This will be defined through the different operational plans to be prepared by different government agencies and stakeholder groups, at different levels.

Secondary – but important – outcomes have been the following:

- Institutional mapping of programmes, projects and initiatives related to IWRM. An institutional mapping provided a clear picture of the institutional overlaps and gaps, which in turn facilitated the clarification of roles and responsibilities among agencies/institutions.
- Identification and development of champions in key strategic Non Government Agencies/ Organisations, Academe, Civil Society Organisations and Local Government Units/ Local Chief Executives.
- Inventory and consolidation of IWRM related documents and reference materials previously housed in various agencies/organisations.

## **Lessons learnt and replicability**

Lessons learnt from the IWRM 2005 programme in the Philippines are the following:

- Formation a Multi-Sectoral Task Force (MSTF) from different key stakeholders and institutions improved inter-agency coordination and communication. Establishing a multi-sectoral task force composed of representatives from key water related agencies opened up the lines of communication between and among the different agencies and stakeholders. The identification of focal persons from each agency or institution ensured continuity.
- Involvement of multi-sectoral stakeholders in the process improved transparency and feedback and provided grounding and localisation of issues, and ensured ownership of the Plan Framework. The participation of a broad range of water related stakeholders resulted in a shared perspective on IWRM.
- Conducting of the IWRM levelling workshop, consultation and other activities increased level of awareness on IWRM. Key project activities, particularly workshops and consultations, were extensive in scope and this provided the opportunity to promote an increased awareness of IWRM.
- The presence of committed and supportive groups would ensure sustainability of IWRM initiatives despite of political issues.

## **Relevance of Case to IWRM**

An effective co-ordination mechanism is important for IWRM. A key issue is the creation of effective co-ordination mechanisms between different agencies in order to increase co-operation and co-ordination which in turn leads to less fragmented management responsibilities and improved effectiveness of water resources management. A close working relationship evolved among the members of the Multi-Sectoral Task Force. With a shared appreciation and knowledge on IWRM, an increased level of synergy and coordination became evident between and among the MSTF members. Through the MSTF, there was a noted improvement in inter-agency coordination and communication.

A participatory approach in IWRM is the only means for achieving long-lasting consensus and common agreements. However, for this to occur, stakeholders and officials from water management agencies have to recognise that the sustainability of the water resource is a common challenge. Governments at national, regional and local levels have the responsibility for making participation possible. The roadmap development process managed to foster constructive dialogue between multiple stakeholders and to engage national stakeholder awareness and commitment. Hence, the process has created substantial stakeholder ownership and a realistic framework for implementation of activities.

## **Contacts, references and organisations**

- Mr. Ramon Alikpala, Executive Director  
National Water Resources Board and Chairman, Philippine Water Partnership  
8th Flr, NIA Building, EDSA, Diliman, Quezon City  
Tel.: +63 2 928 2365, Fax: +63 2 920 2641, Email: rbalikpala@gmail.com
- Mrs. Isidra Peñaranda, Planning Officer IV and OIC, Policy and Programme  
Division, National Water Resources Board, 8th Flr, NIA Building, EDSA,  
Diliman, Quezon City  
Tel.: +63 2 920 2724, Fax: +63 2 920 2724, Email: idp\_nwrb@yahoo.com

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- Strategic Planning & Management of Water Resources (Asia & Pacific), <http://www.spmwater-asiapacific.net>
- Mogens Dyhr-Nielsen, UCC-Water, Agern Alle 5, DK 2970 Hørsholm, Denmark  
Phone: +45 4516 9200, [mdn@dhigroup.com](mailto:mdn@dhigroup.com)

## Annex 1: Sub-regions & Countries Involved in the Roadmaps for IWRM Development Process

Sub-region	Country
North Africa	Mauritania
	Egypt
	Tunisia
	Algeria
	Libya
	Morocco
West Africa	Togo
	Liberia
	Ivory Coast
Caribbean - SIDS	Anguilla
	Antigua Barbuda
	Barbados
	Bahamas
	Dominica
	Grenada
	Jamaica
	Montserrat
	St. Kitts Nevis
	St. Lucia
Central Asia	Kyrgyzstan
	Tajikistan
	Uzbekistan
South East Asia	Cambodia
	Lao PDR
	Indonesia
	Thailand
	Philippines
	Vietnam
Central America	Belize
	Guatemala
	Honduras
	El Salvador
	Nicaragua
	Costa Rica
	Panama
South America Andean Countries	Bolivia
	Colombia
	Ecuador
	Peru
South America - South Cone	Argentina
	Brazil

	Chile
	Paraguay
	Uruguay
	Venezuela
Central/Southern Africa	Tanzania
	Botswana
	Namibia
	Lesotho
	Zambia
	Democratic Republic of Congo
	Malawi
	Mauritius
	Angola
	Mozambique
	South Africa
	Swaziland
	Zimbabwe

## Annex 2: Kyrgyzstan IWRM roadmap

Please note that all 19 country roadmaps are available upon request from UCC-Water. The roadmap for Kyrgyzstan below is provided as an example. For further details, please contact Mr Niels Henrik Ipsen ([nhi@dhigroup.com](mailto:nhi@dhigroup.com)) or Gareth James Lloyd ([gjl@dhigroup.com](mailto:gjl@dhigroup.com)).

The roadmap of Kyrgyzstan may be downloaded through this link:  
[http://www.cawater-info.net/ucc-water/pdf/kyr\\_road\\_map\\_en.pdf](http://www.cawater-info.net/ucc-water/pdf/kyr_road_map_en.pdf)

Or by opening this file:



kyrgyzstan\_road  
map



**"ROAD MAP"**  
**PLANNED STEPS TOWARDS REALIZATION OF THE**  
**IWRM PRINCIPLES**  
**and**  
**RATIONALE OF THE ESSENTIAL ACTIVITIES**  
**IN THE KYRGYZ REPUBLIC**



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