

# From concept to practice

Key features, lessons learned and recommendations  
from implementation of the IWRM 2005 Target



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UNEP Collaborating Centre on Water and Environment  
September 2010

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## Integrated Water Resources Management

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Integrated Water Resources Management (IWRM) is accepted around the world as an effective approach to managing river basins for sustainable use. The need for an integrated water management approach was suggested as early as the late 1980s and early 1990s at international conferences on water-related environmental issues, including the 1992 International Conference on Water and Environment in Dublin (ICWE, 1992), and the 1992 UN Conference on Environment and Development (UNCED, 1992) in Rio de Janeiro. A conclusion of the latter conference was that holistic management of freshwater as a finite, vulnerable resource, and the integration of sectoral water plans and programmes within the framework of national economic and social policies, were of paramount importance for sustainable water resources management. Further, addressing this goal required a dynamic, interactive, iterative and multi-sectoral approach to water resources management, including integration of technological, socioeconomic, environmental and human health considerations.

Another UNCED output was the perception of water as an integral part of the ecosystem, a natural resource and a social and economic good, with its quantity and quality defining the nature of its utilization. This perception was previously espoused in 1986 in the holistic water management approach of the United Nations Environment Programme (UNEP), “Environmentally-Sound Management of Inland Waters” (EMINWA). The Global Environment Facility (GEF) also subsequently proposed an integrated approach for managing transboundary freshwater systems, utilizing a two-phase approach of (i) analysis and (ii) action (GEF, 2002). The analysis phase comprised the development

of a basin-scale ‘Transboundary Diagnostic Analysis’ (TDA), highlighting both its scientific/technical and socio-economic characteristics, with the major goal being to identify and prioritize constraints to sustainable water use, as well as their root causes. Subsequent elaboration of a transboundary ‘Strategic Action Programme’ (SAP) identifies the agreed activities and programmes for addressing these constraints and their root causes.

In contrast to the traditional sector-based management approach, integrated water resources management deals with all water functions on equal terms within the framework of an integrated water system. This latter approach considers not only the scientific and technical aspects of managing water systems for sustainable use, but also the socio-economic, institutional, policy and political aspects – the so-called governance elements – of this goal. These latter aspects include the legal and institutional framework, economic conditions, public awareness, cultural and social customs, educational characteristics, political realities, etc., which fundamentally define how humans utilize their water resources.

Because of the increasing interest in integrated management of water systems, the Global Water Partnership (GWP) subsequently attempted to define and ‘operationalize’ the concept of Integrated Water Resources Management. The GWP worked to promote coordinated development and management of water, land and related resources, in order to maximize economic and social welfare equitably, while also maintaining the sustainability of life-supporting ecosystems (GWP, 2000). The GWP continues to refine the IWRM concept into a practical river basin management tool, observing that IWRM is not an

end in itself, but rather a means to achieve the three key strategic objectives of economic efficiency in water use, equity, and environmental and ecological sustainability. Three important elements to address these objectives include an enabling environment of appropriate water resources policies and legislation; a framework of capable institutions at the national, local and river basin level; and proper management instruments for these institutions (GWP, 2000).

Further impetus to the use of IWRM was agreement to the Johannesburg Plan of Implementation by 193 governments at the World Summit on Sustainable Development (WSSD), held in Johannesburg, South Africa, in 2002. Recognizing that managing our natural resources base in a sustainable and integrated manner requires implementation of strategies that include targets adopted at the national and/or regional level, Article 26 of the Plan calls for development of 'Integrated Water Resources Management and Water Efficiency Plans' by 2005. The GWP subsequently conducted an informal baseline survey of 108 countries (45 in Africa; 42 in Asia and the Pacific; 22 in Latin America) in 2003 to monitor the progress in achieving the Plans. This snapshot survey showed that only about 10% of the surveyed countries had made significant progress in developing their IWRM and Water Efficiency plans, that 50% had taken some steps toward developing their plans, while the remaining 40% were only in initial stages of the process (GWP, 2004a).

The GWP subsequently conducted a more comprehensive survey of 95 countries in 2005 as a progress report on the water efficiency plan targets for the 4th World Water Forum in 2006. This later survey (38 countries in Africa; 23 in Asia and the Pacific; 10 in Europe; 16 in Latin America; and 8 small island developing states) indicated that only 21% of the surveyed countries had strategies/plans in place or well underway, and an additional 53% were in some stage of strategy formulation, while 26%

had only taken initial steps in the process (GWP, 2006). Identified constraints to planning and implementation of IWRM include a lack of political will to foster needed policy changes and to allocate needed financial and other resources, as well as inadequate awareness of water issues, and inadequate institutional capacity.

UN-Water was established in 2003 to provide coordination among UN agencies dealing with freshwater and sanitation issues, particularly as a follow-up to the WSSD and the Millennium Development Goals (MDGs). To further evaluate the progress in developing and implementing IWRM plans, UN-Water subsequently undertook a survey in 2007/2008 of government agencies in 104 countries (77 developing countries/economies in transition; 27 developed countries). The results of the survey questionnaire, prepared for the 16th session of the UN Commission on Sustainable Development (CSD), indicated that only 6 of the 27 developed countries had fully-implemented IWRM plans in place, with another 10 having such plans in place or partially implemented. Only 38% of the 77 developing countries had completed plans (33% of the Asian countries; 38% of the African countries; 43% of the countries in the Americas). The developed countries were the leaders regarding such issues as public awareness campaigns and gender mainstreaming. The Asian countries led in institutional reform issues. While Africa was further advanced among the developing countries in stakeholder participation, microcredit programme, and subsidy issues, it was behind the Americas and Asia on most other IWRM-related issues.

## The UNEP IWRM 2005 Programme

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Although relatively simple in concept, the effective development and application of IWRM is a complex and difficult task involving simultaneous consideration of a range of scientific/technical and socio-economic/governance issues, as well as sectoral water needs. In fact, one cannot identify an unequivocally-accepted definition of this water system management approach. Its effective development and application also requires data, manpower and financial capabilities that may not be readily available to all countries, representing fundamental causes for the slow rate of achievement of the 2005 IWRM target on a global scale.

Among the goals of the 12th session of the UN Commission on Sustainable Development (CSD-12) in April 2004 was to review the thematic clusters of water, sanitation and human settlements. Following CSD-12, the United Nations Environment Programme (UNEP), in collaboration with its Collaborating Centre on Water and Environment (UCC) in Denmark, and with financial support from the Danish International Development Aid (DANIDA), responded with its UNEP IWRM 2005 Programme. Consistent with UNEP's Water Strategy and Policy (2006), a major purpose of the UCC is to support implementation of its water activities, with a focus on the environmental aspects of managing freshwater resources. To this end, the goal of the UNEP IWRM 2005 Programme was to facilitate implementation of the WSSD 2005 IWRM target by providing both financial and technical assistance to support the participating countries in facilitating the transformation of what was essentially an IWRM 'vision' to a practical, operational IWRM plan. The Programme results also provided key inputs for a UN-Water (2008) status report on IWRM implementation for the 16th session

of the CSD in 2008, the latter focusing on the problems underlying the global food crisis, including the need for innovative, sustainable agricultural technologies and infrastructure in developing countries.

### Approach undertaken in the UNEP IWRM 2005 Programme

The Programme involved 58 participating countries in South East and Central Asia, North, Central, Southern and West Africa, Central America and the Caribbean, and the Andean and Cone regions of South America (Annex 1). In undertaking this task, the UNEP IWRM 2005 Programme strategy was to support individual countries in these sub-regions formally requesting planning assistance for IWRM development and implementation, and also to highlight IWRM experiences in other countries. Country representatives participated in regional and national IWRM capacity-building workshops and associated activities. Although specific activities under the Programme varied between countries and regions, common activities typically included the following:

- Organizing and conducting national and regional seminars/workshops for IWRM training, particularly to guide the preparation of 'roadmaps' as initial guides for IWRM development and implementation, with participation of water managers from all levels, water users, private sector and NGOs. The roadmaps were to identify both practical short-term and long-term strategies and actions for moving toward the 2005 IWRM target;
- Managerial capacity-building workshops/training for senior representatives of key water sector ministries

and institutions, including sharing experiences and lessons learned between countries;

- Utilizing a survey and dialogue with senior officials regarding national water policies, legislation and regulations, institutional frameworks, processes and milestones toward IWRM, as well as capacity to undertake IWRM functions, as a means of determining the status of water resources management, and progress towards 2005 national IWRM targets. This effort included: (i) establishing the progress of each country and sub-region in terms of formally adopting and implementing IWRM; (ii) providing a baseline for measuring future progress at a later date; and (iii) identifying priority areas for individual countries and donor community to focus efforts and assistance;
- Developing public education and awareness capacity and materials on IWRM-related water issues;
- Assisting in developing proposals for sub-regional IWRM strategies; and
- Developing sub-regional reports that identify processes, outcomes and outputs.

## IWRM survey goals

Progress in IWRM implementation in the participating countries was measured through national surveys that were a major information and data source for the UNEP IWRM 2005 Programme. The surveys also informed UN-Water in its survey on progress in achieving the IWRM 2005 Target. The 120 survey questions focused on IWRM-related national water policies, legislation, institutions and policies, as well as processes and milestones leading to IWRM. Specific topics of interest were as follows:

**(1) The status of the participating countries in the IWRM planning process.** This provided a snapshot of a country's IWRM planning process. Specific topics included: (i) major challenges to water resources management issues, and (ii) short- and long-term economic

development goals and associated water management challenges. Relevant water governance issues included the existing range of political, social, economic and administrative systems for developing and managing water resources and water service delivery at different societal levels), and specific water challenges/problems associated with economic development goals.

### **(2) Existing constraints to the IWRM planning process.**

This identified factors hindering IWRM development and implementation, including a focus on: (i) the enabling environment of appropriate policies, legislation and strategies; (ii) the institutional framework needed to implement policies, legislation and strategies; and (iii) management instruments needed to carry out policies, legislation and strategies. Initial constraints regarding these matters included inadequate awareness and/or understanding of relevant water resources issues, coupled with a lack of political will and/or inadequate capacity to address them.

### **(3) Actions to be undertaken by a country to reach its IWRM plan.**

This identified the actions and programmes needed to deal with constraints to specific IWRM priorities and goals. A relevant issue was the existence of a participatory approach, since public involvement in, and acceptance of, an IWRM programme is fundamental for its ultimate success. Important criteria elements include: (i) detailed programme assessments and development of knowledge base(s); (ii) awareness building/campaigns; (iii) capacity-building efforts; (iv) data and information sharing; and (v) sustainable financing, all directed ultimately to the identified IWRM goals.

### **(4) Requirements to implement the needed actions.**

This considered: (i) the feasibility of actions under existing social, economic and political realities; (ii) initial actions and changes as prerequisites for other changes; (iii) the relative costs and benefits of various IWRM programme

actions/changes; and (iv) the extent to which the actions and changes represent a mutually-reinforcing package. These actions typically require information on objectives, rationale, approaches to be used, completion timeframe, identification of responsible executor(s), expected outputs, and associated costs.

As noted above, each participating country prepared individual national reports as information and data sources for the Programme. Each country report typically included the following components: (1) geographical context; (2) social and economic context; (3) national water resources situation; (4) state of the IWRM process; (5) future perspectives for continuing the IWRM process; and (6) constraints, opportunities and perspectives regarding IWRM and its future perspectives.

## Achievements of the UNEP IWRM 2005 Programme

### Programme results

The Programme was a major effort to assist participating countries to further their strategies and actions for implementing IWRM, focusing on the national level.

The most significant outputs of the UNEP IWRM 2005 Programme included the following:

- **IWRM roadmaps and reports from 19 participating countries.** These were very important documents in the Programme, identifying the main reform activities within the IWRM enabling environment, including the institutional framework over the 2007-2025 period.
- **Roadmap Case Book.** This document explored the experiences of eight selected case studies in developing IWRM roadmaps, exhibiting a range of environmental and socio-economic settings.
- **Concept and issues papers.** Three thematic papers were prepared to assist IWRM planner and implementers to: (i) address IWRM environmental issues (*Addressing Environmental Aspects of IWRM*); (ii) link river and lake management concerns (*Sustainable Management of Lakes and Basins in the Context of IWRM*); and (iii) monitor progress in IWRM implementation (*A Structure for the Monitoring of Progress Towards IWRM*).
- **Sub-regional, ministerial policy dialogue and awareness-raising.** These activities were meant to inform senior officials and vice-ministers about specific IWRM issues, including transboundary water cooperation, water management decentralization, capacity building and monitoring needs.
- **Capacity-building.** Capacity-building components included IWRM 'toolbox' training, sharing of

information and experiences, and stakeholder involvement.

- **Country-level IWRM surveys.** This activity comprised detailed surveys of 58 countries regarding the status of IWRM process implementation on the national level.

### Major lessons learned

It is recalled that UNEP directly supported 19 of the 58 participating countries in the UNEP IWRM 2005 Programme to develop national IWRM roadmaps. UN-Water (2008; UN-Water and Global Water Partnership 2009) stressed that IWRM must be more than a planning mechanism. Rather, water issues must be mainstreamed into national political economies to ensure the sustainability of IWRM political, social and economic elements. Because of the previously-noted difficulty in developing IWRM programmes and their slow rate of implementation, however, the IWRM roadmaps were prepared to serve as a pre-planning exercise, including timeframes and milestones for developing and implementing IWRM strategies and actions. They served as important initial roadmaps to guide the more complicated process of IWRM development and implementation.

The major 'lessons learned' from the UNEP IWRM 2005 Programme focus on the IWRM experiences from eight selected countries (Argentina, Cambodia, Columbia, Grenada, Kyrgyzstan, Lesotho, Liberia, and Philippines) among the 19 countries involved in preparing national IWRM roadmaps. These countries were selected because their individual and collective situations spanned the range of experiences likely to be encountered when developing

and implementing effective IWRM programmes. Further details on the criteria for selection are provided in Annex 2, while the UCC (2007) provides further information on the experiences of all the participating countries in the Programme.

The major lessons learned from these selected countries, based on both the IWRM surveys and IWRM roadmap development, include the following:

**(1) Local ownership is an important catalyst for the IWRM process.** This was an important factor in virtually all the selected countries. Local ownership not only encouraged local participation in the IWRM process, but also facilitated dissemination of the knowledge and information gained in the process. Further, it facilitated the sharing of relevant IWRM strategies and activities. Relevant actions in the Programme included actions as simple as conducting IWRM workshops and discussions in the local/national language. Using the national language in Cambodia, for example, resulted in a number of positive actions, including: (i) facilitating involvement of indigenous stakeholders; (ii) aiding in providing needed capacity-building; and (iii) reducing possible misunderstandings and misconceptions among stakeholder groups regarding complex IWRM issues. The relevant stakeholders included decision-makers and managers responsible for implementing IWRM activities/programmes. The Philippine experience illustrated that the presence of committed, supportive stakeholder groups at the local level can foster sustainability of IWRM initiatives, even in the face of competing political issues. Local ownership also helped define the rights of the stakeholder population in relation to water issues and services, as was evidenced in the Columbian IWRM roadmap development process.

The experience in Grenada highlighted the value of stressing the potential negative health and economic impacts in the absence of an IWRM framework. It

illustrated that people in affected communities, as well as decision-makers, are likely to pay more attention to IWRM issues when their health is threatened. This reality also helped foster local ownership of the IWRM process in this case study. The Grenadian experience also highlighted that partnerships with local groups can significantly assist in IWRM logistics and implementation.

The Liberia and Kyrgyzstan experiences illustrated that the IWRM process can be achieved with minimal input from foreign experts, particularly if IWRM roadmaps were developed on the basis of locally/nationally-available data and information. It also facilitated ownership of the IWRM roadmaps by these countries, again fostering a sense of local ownership of the IWRM process. Localizing IWRM strategies and activities usually also works to reduce their associated implementation costs.

**(2) Sharing experiences and information enhances the IWRM process.** The notion of not ‘re-inventing the wheel’ also is relevant to developing IWRM roadmaps. Although the contexts of individual countries and situations may vary, the issues to be addressed, and the possible options for addressing them, are often not unique. It is likely that countries at similar stages of development typically face similar problems and issues. Their experiences in attempting to address them can provide guidance and insight to others experiencing the same problems and issues. The IWRM roadmap development process in Argentina, for example, greatly benefited from the experience gained from similar considerations in nearby Brazil.

The Colombian experience illustrated the importance of a sound baseline document and clear proposals. Colombia provided numerous examples of different water user experiences applicable to its IWRM roadmap process, including those of local communities, water companies, water users, academic institutions, etc. The Grenada case

study highlighted that public education and awareness was important in assisting the public to understand that many human activities can have negative impacts on water systems. Education and awareness-raising activities can facilitate information exchange, thereby also working to change negative human behaviors that can constrain effective IWRM development and implementation.

Sharing of experiences also worked to enhance water-related management capacity, including an increased sense of accountability, ownership and responsibility for the IWRM framework. As an example, the IWRM survey questionnaires were instrumental in facilitating assessment of IWRM progress in Liberia, including identifying specific programme and capacity-building needs for implementing IWRM. Activities undertaken within the context of development cooperation between the European Union (EU) and the countries of the African, Caribbean and Pacific Group of States (ACP) illustrated that sub-regional IWRM training courses also were a useful forum for the participating EU-ACP countries to express their need for assistance in their own IWRM activities. The Philippine experience provided similar conclusions from its IWRM leveling workshops and related activities. A noteworthy effort regarding experience sharing occurred in Central Asia, with Kyrgyzstan, Uzbekistan and Tajikistan jointly drafting a synthesis report, conducting policy dialogues, and engaging in awareness raising, facilitating subsequent discussions on transboundary water issues.

**(3) IWRM activities should be linked to existing national processes and frameworks.** Because most countries have a long history of experience in water management, and consistent with the desire of not having to “reinvent the wheel,” it is very useful to link IWRM activities and programmes to the maximum extent with existing processes and projects. Such efforts provide synergy to both the existing programmes and to IWRM development and implementation. Cambodia, for example,

gave its national APEX body (Ministry of Water Resources and Meteorology) direct responsibility for drafting its IWRM strategy and roadmap, thereby maximizing the political and administrative impacts of the outcome. As previously noted, the Grenada experience illustrated that partnerships with other agencies and activities, including local groups, would facilitate the long-term sustainability of its IWRM initiative. As a precaution, however, the Grenada experience also highlighted the need to allow sufficient time to prepare an IWRM roadmap, a conclusion also identified in the Kyrgyzstan experience. Further, the Kyrgyzstan experience also highlighted the value of building an IWRM programme on already-existing organizational networks. In this latter case, national representatives involved in the transboundary IWRM Fergana Valley project were also given responsibility for coordinating national IWRM programme activities. The objective of this latter project was to contribute to more secure livelihoods, environmental sustainability and greater social harmony through improving the effectiveness of water resources management in the valley.

Linking IWRM activities with ongoing national/transboundary activities or programmes also requires clear identification of the content, status and potential of existing plans and activities. Both Grenada and Lesotho, for example, were already involved in establishing national water policies or water sector improvement projects, with these ongoing activities being a strong impetus to the IWRM roadmap development process in both cases. Likewise, future planned activities or programmes should not be ignored. Liberia collaborated with the European Union, for example, to develop a funded project to support development and implementation of its IWRM plan.

**(4) Participatory processes ensure more sustainable IWRM development and implementation.** One of the most important elements in developing and implementing

IWRM is to ensure that all relevant water stakeholders are involved in the IWRM roadmap process. The stakeholder list can be a long one in an individual case, including governments, water providers and users, institutions, private sector, civil society, media and academicians. A participatory IWRM approach also is generally more sustainable. A constraining factor in a participatory IWRM process, however, is that it is typically more complex, requiring more time, effort and finances than a non-participatory process – an important reality in designing an IWRM roadmap. A participatory process also can foster conflicting interests hindering IWRM development and implementation. Although governments usually prefer a “top-down” approach for addressing water issues, this approach may not be successful because it does not consider the full range of relevant IWRM issues. The Colombian experience, for example, illustrated that different stakeholders often have different visions and different needs that may be ignored in a top-down IWRM approach. The Philippine experience provided the contrasting observation that involvement of a broad range of water system stakeholders can create a shared, more readily-accepted perspective of IWRM, one that can be translated into long-term actions and solutions. A participatory approach also fosters local ownership of IWRM activities, thereby facilitating their successful implementation. This approach also can activate stakeholders in the IWRM process. As an example, Argentina incorporated a “bottom-up” approach to IWRM that illustrated that overcoming the inertia of the IWRM process can be problematic. Once the momentum for IWRM development and implementation has been created, however, it often is difficult to stop the process, thereby ensuring its function as a kind of self-fueling IWRM ‘engine.’

The Drafting Task Force in Cambodia for developing its IWRM strategy and roadmap included multi-departmental representatives. This provided the opportunity to establish

mutual acquaintances and contacts facilitating the IWRM process. As previously noted, use of the national language in this effort ensured a greater degree of participation, as well as facilitating information sharing, in the IWRM roadmap process. The experience in Grenada indicated that NGOs and community-based organizations (CBOs) can play important roles in the IWRM participation and consultative process for small island developing states, thereby ensuring greater IWRM sustainability.

The Kyrgyzstan case study illustrated that multi-sectoral stakeholder involvement in a participatory manner can improve the transparency of the IWRM process. It also provided the opportunity for valuable feedback on the need to ensure ownership, acceptability and support for developing and implementing IWRM. The formation of a multi-sectoral task force, with participation from different key stakeholders and institutions, also improved interagency coordination and communication in the IWRM process in the Philippines.

**(5) Adaptable approaches facilitate development of IWRM roadmaps.** As previously noted, a primary objective of the UNEP IWRM 2005 Programme was not to actually develop or implement IWRM strategies or activities in the selected countries, but rather to assist them in developing IWRM roadmaps. In some cases, however, stakeholder support and enthusiasm, and consideration of local conditions and capabilities, provided flexibility that facilitated development of IWRM roadmaps with sufficient operational detail to actually serve as an IWRM programme, at least on an interim basis. The value of the IWRM roadmap approach was particularly evident with the experiences in the Cambodian, Colombian and Liberian case studies, and to varying degrees in the other selected case studies. It also resulted in institutional strengthening in most participating countries, with the experiences in Argentina and Lesotho providing positive examples.

## Major contributions of the UNEP IWRM 2005 Programme

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In highlighting the above-noted lessons learned, and as previously noted by the GWP and UNEP IWRM 2005 Programme, the IWRM process is not an end in itself. Rather, it represents a continuing process of development, implementation, evaluation and revision. Although it can be complex in design and content, and may illuminate conflicting and constraining obstacles, the experiences highlighted in the Programme illustrated that developing and implementing effective IWRM strategies and activities are significant contributions to achieving the often-elusive goal of sustainable use of freshwater resources, whether on a basin, national, transboundary or regional scale.

In reviewing the development of the IWRM approach, the first national major effort to develop an IWRM action plan after the Dublin and UNCED conferences was probably attributable to the experiences in Uganda, beginning in 1993. In fact, the three IWRM 'pillars' of enabling environment, institutional roles, and management instruments could be attributed to the subsequently-developed Uganda Water Action Plan, the first major impetus for the conceptual development of IWRM.

### IWRM roadmaps

Other countries have engaged in large-scale water management projects subsequent to the Uganda experience. Overall progress with such efforts, however, has been slow, typically requiring considerable time, manpower and funds. Although many countries, particularly developing nations, have expressed a desire to develop and implement effective IWRM programmes, it has become clear that a simpler, more practical, and more understandable approach was necessary to achieve this goal – including

helping countries to better define their needs – and to facilitate development of needed water programmes.

This need was the impetus for UNDP IWRM 2005 Programme assistance to the above-noted selected countries to develop IWRM roadmaps. Indeed, the roadmaps represent the most useful and innovative outcome of the Programme. They have provided preliminary guidance, in the form of a step-by-step approach, for initiating the development of IWRM programmes. This guidance includes identifying necessary activities, timeframes and milestones. In providing such initial guidance, the roadmaps identified both practical short-term and long-term strategies and actions for moving toward the more complicated, longer-timeframe IWRM target of the WSSD.

Thus, there is no doubt that development of IWRM roadmaps was a major outcome of the UNDP IWRM 2005 Programme. The roadmaps provided a means for countries to begin their IWRM process. In addition to being a relatively inexpensive exercise for the individual selected countries, it also was very valuable in helping them overcome initial constraints to the IWRM process. The roadmaps provided the countries with the opportunity to better articulate what they needed to develop and implement a national-based IWRM programme. In addition to energizing the participating countries, it assisted them to better identify their water system management needs in a simpler, more feasible manner. This was in contrast to engaging in a large-scale water project as an initial effort. The articulation of IWRM roadmaps can be used for the same purpose in future IWRM development projects in other countries. As a practical example, Ghana, which

was not part of the UNEP IWRM 2005 Programme, nevertheless has considerable experience and knowledge regarding water management issues and needs. It also is relatively well-advanced in many areas of IWRM. At the same time, it has not possessed the capacity to put these elements together into an overall IWRM framework, although plans have recently been considered for this eventuality. Such examples provide excellent illustrations of where, and under what conditions, the IWRM roadmap development exercise can be most helpful.

It is clear that IWRM roadmaps from different countries will not be uniform. Rather, they will address differing needs and concerns at different levels in a given country. They also will reflect the current status of a country in regard to its IWRM efforts, and help identify the actions that can be undertaken from the present time. The short- and long-term goals of the participating countries also will vary. The presence of different stakeholders in individual countries will typically result in differing, sometimes conflicting, national concerns and needs. Accordingly, some IWRM roadmaps will be more detailed, containing milestones and timeframes for concrete actions in the water and related sectors. In contrast, other country roadmaps may be less detailed in their content. The UNEP IWRM 2005 Programme provided many lessons learned, not the least of which is that there is no cookbook approach to water resources management. Rather, different countries will approach the issue in different ways, depending on their individual goals, and on their financial and manpower capabilities and constraints. Against this background, the IWRM roadmap approach provided needed structure to the IWRM development process. Indeed, in the absence of such guidance, developing an effective IWRM programme may have the dubious distinction of being everything and nothing at the same time.

It also is noted that the development of IWRM roadmaps did not change the comprehension or relevant components

of IWRM. Rather, in recognition of the slow rate of progress in developing and implementing IWRM in many developing countries, the roadmaps can help speed up, and even 'inspire,' the IWRM process, particularly in getting governments engaged in needed actions and programmes. In other words, the IWRM roadmaps represent project documents for IWRM plans, focusing on identifying what it will take to develop an IWRM plan in a practical, timely and effective manner. Such guidance also will serve to better articulate the relevant needs of participating countries to donors. In fact, IWRM roadmaps might even give countries seeking donor funds an advantage over those countries lacking such roadmaps. The existence of an IWRM roadmap for an individual country would suggest it was more advanced in its quest to implement IWRM, including identification of what was needed to achieve it, and the relevant steps required to move it forward in an effective manner.

## Regional/sub-regional approach to IWRM

A challenge in the UNEP IWRM 2005 Programme was how to pursue the Programme goals, particularly development of IWRM roadmaps, in a practical and timely manner. To this end, the second major contribution of the Programme was the recognition that a regional or sub-regional approach to IWRM development was preferable to a global-scale approach.

The key to achieving this goal was to involve groups of agreeable countries to cooperate in developing IWRM roadmaps. A regional approach appeared to work best in addressing the Programme goals, rather than engaging in isolated country-level IWRM efforts. This reality required the Programme to focus its efforts in areas where relevant water networks already existed. These areas were mainly West, Central and Southern Africa, South East Asia, and Central America.

The Programme results indicate it would have been difficult to achieve the Programme goals without utilizing these regional networks and organizations. The existence of groups of cooperative individuals and agencies facilitated these goals, working well for virtually all the selected participating countries. Further, most of the countries in a given region often were already involved in water-related activities, whether or not they were part of the IWRM roadmap development efforts. Such involvement provided additional useful input into the roadmap exercise. The activities in Liberia, Togo and Ghana, for example were catalyzed by their water-related involvement in the Economic Community for West African States (ECOWAS). The activities in Lesotho and Angola were catalyzed by their similar involvement in the Southern African Development Community (SADC).

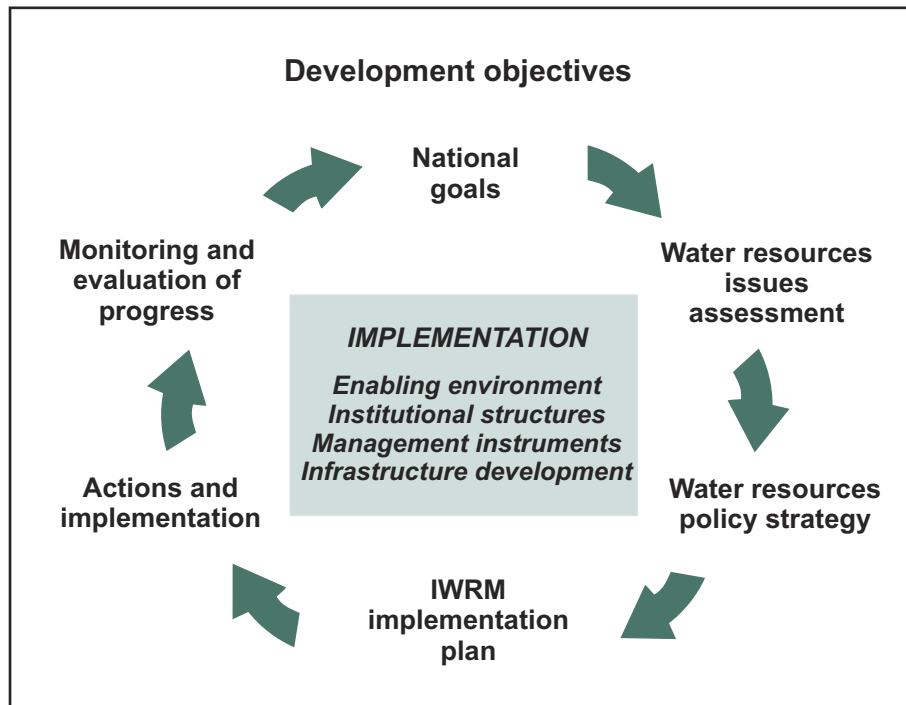
In carrying out the UNEP IWRM 2005 Programme, the UCC typically interacted with individuals and agencies in several countries in a region or sub-region, combining its ideas with those of the countries in regional/sub-regional IWRM roadmap development activities. Country consultations with UCC project teams, and DANIDA funding, were fundamental to developing IWRM roadmaps. Such interacting consultations also facilitated the identification of training goals, national capabilities, relevant stakeholders, and apex groups within each country, with a primary focus on governmental agencies as core IWRM entities. There is no reason to believe that this approach would not also be useful for developed countries. As an example, although the European Water Partnership would be a logical focal point for addressing IWRM issues in Europe, effective IWRM development and implementation must originate within the European community, again highlighting the value of a regional approach.

## Conclusions

As clearly demonstrated by its case studies, the UNEP IWRM 2005 Programme assisted many developing countries to better frame their IWRM needs and goals. In directly supporting 19 of the 58 participating countries, the UNEP IWRM 2005 Programme facilitated development of national IWRM roadmaps, probably its most valuable output.

The roadmaps helped the participating countries to identify both practical short-term and long-term actions for moving toward the WSSD 2005 IWRM target. The Programme used what was described by the GWP (2004b) as an integrated Water Resources Management Cycle (Figure 1) to guide the IWRM planning process (UC-Water and Global Water Partnership 2009).

FIGURE 1  
Stages in IWRM planning and implementation <sup>7</sup>



(Source: UC-Water and Global Water Partnership 2009)

This cycle begins with the planning process, and progresses into development and implementation of the IWRM framework and activities. Development of an IWRM roadmap provides initial guidance for establishing overall IWRM goals, building IWRM awareness raising, analyzing IWRM framework gaps, preparing IWRM strategies and action plans, and building commitment at the highest political levels.

A second major contribution of the UNEP IWRM 2005 Programme was to demonstrate the feasibility of focusing on regional and sub-regional application, rather than attempting global-scale applications, particularly in the initial phase of IWRM development. This approach includes appropriate consideration of shared water basins as well as the institutions responsible for sub-regional water resources management.

Complementing such activities, another noteworthy integrated management approach directed to the sustainable use of lake ecosystems is that of 'Integrated Lake Basin Management' (ILBM). Similar in goals to those of IWRM, this management approach, promulgated by the International Lake Environment Committee (ILEC), focuses on the assessment and integrated management of natural and artificial lake basins. ILBM pays particular attention to lake basin governance, one of the most difficult challenges facing the holistic management of water systems. As an essential additional element, ILBM addresses the management challenges facing the complex lentic-lotic hydrologic linkages that characterize lake basins (ILEC, 2006; 2007).

There is no doubt the concept of IWRM will continue to drive management efforts directed to river basins and related water systems. There also is no doubt that continuing evolution of the IWRM development and implementation process will be marked by varying levels of confusion, complexity and disorder, as

well as wasted manpower and financial resources in some cases.

Nevertheless, an integrated management approach such as that embodied in IWRM is essential to ensure the sustainable use of our freshwater resources – resources that are at the same time, finite, sensitive and which have no substitutes for their many uses. The many complex, often subtle, linkages between natural and artificial water systems and human water needs, for both personal well-being and economic advancement, also will be continuing constraints to achieving effective IWRM.

In spite of such constraints, pursuit of effective IWRM must remain at the core of water management efforts, both for individual countries and for regional groupings of countries. Activities such as those embodied in the continuing efforts of UNEP, UCC, GWP and ILEC, as well as the ambitious goals outlined by the WSSD in the MDGs and those of the CSD, require continuing efforts to better define IWRM, and to provide insightful guidance on its structure, content and entities. Country experiences and collaborative activities such as those identified and supported by the UNEP IWRM 2005 Programme provide valuable guidance for national governance efforts needed to facilitate achievement of such goals.

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## Annex 1

### Sub-regions & countries involved in the IWRM roadmap development process

| Sub-region       | Country         |
|------------------|-----------------|
| North Africa     | Algeria         |
|                  | Egypt           |
|                  | Libya           |
|                  | Mauritania      |
|                  | Morocco         |
|                  | Tunisia         |
| West Africa      | Ivory Coast     |
|                  | Liberia         |
|                  | Togo            |
| 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        |
|                  | Indonesia       |
|                  | Lao PDR         |
|                  | Philippines     |
|                  | Thailand        |
|                  | Vietnam         |

| Sub-region                     | Country                      |
|--------------------------------|------------------------------|
| Central America                | Belize                       |
|                                | Costa Rica                   |
|                                | El Salvador                  |
|                                | Guatemala                    |
|                                | Honduras                     |
|                                | Nicaragua                    |
|                                | Panama                       |
| South America Andean countries | Bolivia                      |
|                                | Colombia                     |
|                                | Ecuador                      |
|                                | Peru                         |
| South America – South Cone     | Argentina                    |
|                                | Brazil                       |
|                                | Chile                        |
|                                | Paraguay                     |
|                                | Uruguay                      |
|                                | Venezuela                    |
| Central/Southern Africa        | Angola                       |
|                                | Botswana                     |
|                                | Democratic Republic of Congo |
|                                | Lesotho                      |
|                                | Malawi                       |
|                                | Mauritius                    |
|                                | Mozambique                   |
|                                | Namibia                      |
|                                | South Africa                 |
|                                | Swaziland                    |
|                                | Tanzania                     |
|                                | Zambia                       |
|                                | Zimbabwe                     |

## Annex 2

### Selected IWRM case studies

| Country (case title)   | IWRM issue(s) illustrated by case study   |
|--|---|
| <b>Argentina</b><br>(Building Consensus on a National IWRM Process)                      | The importance of reaching concurrence in a federal country in which independent jurisdictions (states) have original domain over water resources |
| <b>Cambodia</b><br>(Multi-stakeholder Drafting of National IWRM Strategies and Roadmaps) | How the process of developing the roadmap brought stakeholders together, opening up lines of communication  |
| <b>Columbia</b><br>(Steps Towards Building an IWRM Process)                              | Addressing weaknesses in the management framework in order to promote sustainable water resources development                                     |
| <b>Grenada</b><br>(Drawing a Roadmap Towards IWRM)                                       | Recognizing the value of broad stakeholder involvement when IWRM was being built into national water policy                                       |
| <b>Kyrgyzstan</b><br>(Building an IWRM process Using Existing Structures)                | Appreciating the strengths and potential of experience sharing with existing management frameworks  |
| <b>Lesotho</b><br>(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><br>(Supporting the IWRM Process After 14 Years of Civil Crises)           | How promoting sustainable water resources management of water resources is key to improving socio-economic conditions                             |
| <b>Philippines</b><br>(Working Together to Secure Sustainable Water for All)             | Recognizing the need for holistic water management built on considerations of equity, the environment and economics                               |

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