



# Implementing Integrated Water Resources Management (IWRM): based on Thailand's experience

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## Acronyms

ADB:	Asian Development Bank
DWR:	Department of Water Resources
GWP:	Global Water Partnership
IWRM:	Integrated Water Resource Management
MoNRE:	Ministry of National Resources and Environment
NWRC:	National Water Resource Committee
PCD:	Pollution Control Department
PDA:	Pilot and Demonstration Activities
RID:	Royal Integration Department
TEC:	Technical Committee
TWRA:	Thailand Water Resources Association
WB:	World Bank
YRBC:	Yom River Basin Committee

# Introduction

Integrated Water Resources Management (IWRM) has gained worldwide recognition as an important approach towards more effective management of increasingly scarce water resources. Many countries in the Asian region have accepted and/or adopted IWRM as a strategy for sustainable water management, and a number of international and national development organizations have continued to advocate for its implementation. However, there are varying interpretations about this approach. Some put a lot of emphasis on the conceptualization and preparation of IWRM plans, while others are focused on ensuring that IWRM is implemented well regardless of inadequacies in existing planning processes and forms. Ultimately, the challenge is how to put IWRM into practice.

The objective of this paper is to provide an overview of how IWRM was implemented in Thailand and to suggest some useful steps that may be considered by other countries in adopting and adapting IWRM to their respective contexts. It should be cautioned that there is no blue print for IWRM that will suit all countries, and that each country has to develop and adjust a particular approach that suits the political, social-economic and cultural conditions of the country.

## What is Integrated Water Resources Management?

The last decade has seen an increasing recognition of the need to protect and sustainably manage our water resources. The international conference on Water and the Environment held in 1992 in Dublin, Ireland, called for new approaches for the assessment, development and management of freshwater resources and produced what is now referred to as the Dublin Principles for sustainable water management.

### Dublin Principles for sustainable water management

- Freshwater is a finite and vulnerable resource, essential to sustain life, development, and environment
- Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels
- Women play a central part in the provision, management and safeguarding of water management and safeguarding of water
- Water has an economic value in all its competing uses and should be recognized as an economic good

Based on the Dublin Principles, the Technical Committee (TEC) of the Global Water Partnership (GWP) defined IWRM as a process towards improved water resources management:

*“IWRM is a process which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital eco-system.”*

In addition, the previous five World Water Forums (1977, 2000, 2003, 2007 and 2009), the Millennium Summit (2000), the World Summit on Sustainable Development (2002) and the four Asia Water Forums (2003, 2005, 2007 and 2009), as well as other international and regional forums had reiterated the need for concerted global and regional actions for sustainable water management action. In particular, one of the Ministerial Declarations issued during the World Summit on Sustainable Development in Johannesburg is *“for every country to have an IWRM plan in place by 2005”*.

IWRM as a process in water resources management is infinitely more important and meaningful than simply having an IWRM plan. IWRM is a process that could enhance water resources management towards economic efficiency, equity and environmental sustainability. Many Southeast Asian countries have traditional or indigenous water management schemes, which if examined closely, relate to IWRM principles. The challenge is that there is little documentation of traditional and indigenous water management practices and therefore they tend to be forgotten or ignored, particularly in the context of more 'efficient' modern technologies and behavioral patterns that tend to misuse rather than conserve water resources. For example, the use of water storage jars, small water impounding systems in rivers and streams using indigenous materials, roof designs with drip edges leading to water collection tanks in a number of countries, terrace and contour farming which

allows an efficient natural way for trapping water along crop patches, all have been practiced in various scales in many countries in the region. Some traditional good water resources management practices are therefore evident in the region and should be appropriately considered in current IWRM thinking.

## Institutionalizing IWRM

Since IWRM is an integrative, novel approach, its implementation involves changes in the management and implementation of the usual or current systems. Change management as a deliberate process can be time consuming, and without an appropriate strategy and follow-through, might lead only to confusion, situation deterioration, and loss of social, financial, and technological investments.

In the case of Thailand, a loose strategy or road map for IWRM was contemplated from the very beginning by focusing on the following steps:

- The approach started with having a clear understanding of IWRM, and a consensus among water-related professionals and civil society that IWRM is indeed a potentially good approach for the effective management of water resources. The need for an IWRM plan or document per se, was not a particular requirement, and in fact it was never mentioned in the beginning. Rather, the emphasis on practical implementation for IWRM particularly at the local level was the main focus and challenge, with the idea of an IWRM plan only evolving later based on need. To further articulate these challenges and needs, a series of seminars and workshops were carried out to come up with a national vision on water resources management based on the IWRM concept.

As the national water vision was being discussed, it became apparent that the three pillars of IWRM -- the enabling environment, the institutional framework and the management instruments -- are equally important to IWRM. Since ignoring any one of these could imperil an IWRM system, putting IWRM into practice requires a holistic integration of all three elements.

- Given the scope and breadth of IWRM, it is vital to raise awareness and understanding of it among water-related organizations, agencies, civil society organizations, development actors, water users, and other stakeholders and create an IWRM network for sharing, learning, and advocacy. Networking is an effective way to expand the concept of IWRM and bring more synergy into the IWRM process and learning. In Thailand, this activity was done through a series of workshops and trainings. Translating relevant IWRM papers into local language was likewise critical to facilitate local understanding, particularly in developing localized IWRM training modules.

IWRM training and advocacy requires an understanding of local context and needs. It entails adaptation and customization of training materials to avoid failures of supply-driven IWRM training courses that have a tendency to focus largely on theoretical concepts and institutional policies that may be difficult to comprehend particularly for stakeholders who have not been exposed to such concepts. Relating the concept to their water needs and to practical solutions linked to IWRM, was, from Thailand's experience, the most effective way to advocate for IWRM implementation on the ground. Unique training modules were designed for various stakeholders, from duty bearers (e.g., policy makers, water service providers, water regulators, etc.) to claim holders (e.g., water users). Simple and popularized versions of training materials, e.g., cartoons, particularly for community advocacy, were very useful for easy comprehension and dissemination. At the policy level, case studies of best practices helped to stimulate discussion and demonstrate the elements of IWRM and identify challenges and success factors.

- Involving water professionals and civil society provides a strong platform for networking, but engaging decision makers at the highest level of the government is very important. A government endorsement will provide institutional machinery for integrating IWRM in its policies and development programs, as well as the institutional support for IWRM engagement and partnership.

In the case of Thailand, institutionalizing IWRM within government water policies and programs was a goal from the very beginning. This process started with a wide range of stakeholders' consultation meeting to identify challenges to and action needs for water management, and elevating such recommendations to the Government. Unlike other previous consultation meetings which focused on specific sectors or stakeholder groups only, this particular process, provided a dialogue that enabled agreement, consensus building, and identification of concrete areas of cooperation across sectors and

stakeholders on IWRM. Following these dialogues, the recommendations were forwarded to the National Water Resources Committee (NWRC) for endorsement and then submitted to the Government Cabinet for approval. Under the Thailand Government system, the Cabinet can issue an executive authority in the form of a cabinet resolution that is then observed and implemented by related agencies. These cabinet resolutions have to be in line with existing laws, and are immediately promulgated and implemented as long as they do not contradict relevant existing laws. This approach proved to be successful in the case of IWRM in Thailand as various key elements of IWRM were endorsed by the Cabinet and put into practice by the Government.

## Putting IWRM into practice: Case studies

IWRM was first endorsed on the national level and then implemented in specific areas. Analyzing two specific case studies offers insight into IWRM in Thailand. The first is the Chao-Phraya River. This case shows that establishing a RBC is a key first step, but it must have clear functions and include key members in order to be effective. The second case study involves the Yom River Basin, which has the least developed water resource infrastructure of any of the Chao-Phraya tributaries. This study shows the importance of education and learn-by-doing implementation. In only two years after the project was implemented, there are tangible results and improvements in management.

### Thailand experience at the national level

As previously noted, the approach taken in Thailand to put IWRM into practice is to generate consensus, support and approval from a wide range of water sector stakeholders (e.g. civil society, academia, government) on the key issues, challenges and action needs for effective water management in the country. While an overall process was envisioned, it was not possible to follow a fixed plan and time table given that each succeeding step depended on the outcome of the previous one. Hence, the approach adopted had no fixed plan and time frame, but rather followed a flexible, uncharted program of activities, while keeping strict adherence to the important principles and elements of IWRM. The various steps taken in the overall process are described as follows:

1. A national dialogue to introduce IWRM to a large group of multidisciplinary stakeholders was held in 1999, where the participants endorsed IWRM as a useful process and approach for water resources management and recommended that the Government should be aware of and support IWRM principles. The recommendation was submitted to the Cabinet for endorsement through the NWRC.
2. A multi-stakeholders workshop to draft a national water resources vision was conducted in July 1999. The Cabinet endorsed it as the National Water Vision in July 2000.
3. The National Water Vision was translated into a nine-point water policy again through a multi-stakeholder workshop in March 2000 and the Cabinet endorsed it as the National Water Resource Policy in October 2000.
4. Simultaneous to the above, the government approved a proposal to establish three pilot river basin committees (RBCs) proposed by the National Water Resources Committee in April 1999. Since then, more RBC's have been established with financial support from the government. At present there are 25 RBCs in Thailand, one for each of the 25 major river basins in the country.
5. IWRM training modules were designed for various stakeholders from the grassroots level to decision makers. In the process, the Global Water Partner (GWP) IWRM handbook No. 4 was translated into Thai language and a cartoon version was produced to facilitate understanding and awareness of IWRM. Training programs on IWRM were developed and conducted for the members of RBCs as well as government officials since the establishment of RBCs.
6. A comprehensive and integrated water sector budgetary procedure was discussed and formulated through a series of high-level dialogues and a multi-stakeholder workshop with the aim to strengthen the role of RBCs in developing, implementing and approving RBC water resources management plans. The comprehensive budgetary procedure mandates the RBCs to align their budgets to the national budgetary procedures and timelines and to consider and endorse the water resources projects in their respective river basins as proposed by the various

government agencies prior to submission for budget allocation. The water sector budgetary procedure was submitted to the Cabinet, which then approved the procedure in June 2002.

7. Preparation of river basin plan was launched in 2001 with emphasis on stakeholder participation in the process. The objective was to provide the opportunity for local stakeholders to participate in identifying problems and solutions to water management issues and accordingly formulate basin programs and basin plans with the help of experts and/or consultants who were then engaged to undertake the preparation of all 25 river basin plans. While the plans were not perfect, the process followed provided a concrete opportunity for the experts/consultants and stakeholders to agree on the key components of the plan, and work together as a team. Presently, all projects proposed by all water related agencies now have to engage stakeholders in the project areas through such a public participation process.
8. An institutional reform process with the aim of consolidating water resources related agencies was launched by the Government, resulting to the establishment of the Ministry of Natural Resources and Environment (MoNRE) in 2002. The Department of Water Resources (DWR) was also established under MoNRE by pooling technical staff members from five (5) water related agencies. The DWR was designed to function as a regulating agency, with awareness raising and promotion of IWRM concept as one of its core activities.
9. In 2004, the DWR commissioned the drafting of a National Water Resources Law with the objective of updating and consolidating fragmented water related laws, policies and guidelines in the country. The drafting process itself was a pioneering process, which started with holding public hearings throughout the country to consult stakeholders on the important provisions that should be integrated in the National Water Resources Law. A team of legal experts then drafted the water law to cover all the identified issues, subjects and provisions. This first draft was presented to various stakeholders through a number of public hearings, and legal team integrated the feedback into a second draft. The final draft of the law has been submitted to the Government, and is awaiting Government endorsement to the Parliament for consideration and enactment.

The various steps described above completed the process and fulfilled the objective of putting IWRM into the national water resources management system. The process shows that an IWRM plan per se was not part of the outputs of the process, but rather the emphasis was on a road map that integrated the principles and elements of IWRM into practice, leading to Government endorsement and subsequent implementation at the basin and local levels. Most activities were facilitated through the technical and financial support of the Global Water Partnership (GWP). Without GWP, implementing IWRM would be a challenge, particularly in consensus building, dialogues, and networking, which are all crucial to IWRM.

The various element of IWRM as practiced in Thailand can thus be summarized as follows:

<b>Important elements for IWRM implementation process</b>		
<ul style="list-style-type: none"> <li>▪ Clear and common interpretation of IWRM</li> <li>▪ Awareness raising and participatory processes to produce outputs</li> <li>▪ integrating the three key principles of IWRM</li> <li>▪ IWRM institutionalized into Government system through highest level endorsement</li> <li>▪ Establish water "champions" to catalyze and pursue the policy and implementation process</li> </ul>		
<b>Enabling Environment</b>	<b>Institutional Framework</b>	<b>Management Instrument</b>
National Water Vision National Water Policy Budgeting for RBCs Water Sector Budgetary Procedure Drafted Water Law	River Basin Committees Department of Water Resource (DWR)	Water dialogues IWRM training River basin plan

## Chao-Phraya River case study

### Key factors for the Chao-Phraya River case study

- Formation of RBCs in this most important river basin
- World Bank and ADB partake in studies to improve the pilot RBCs
- Reduce the responsibilities of committee members so that work is more focused and efficient
- 25 RBCs are established throughout the country and are composed of a diverse set of stakeholders

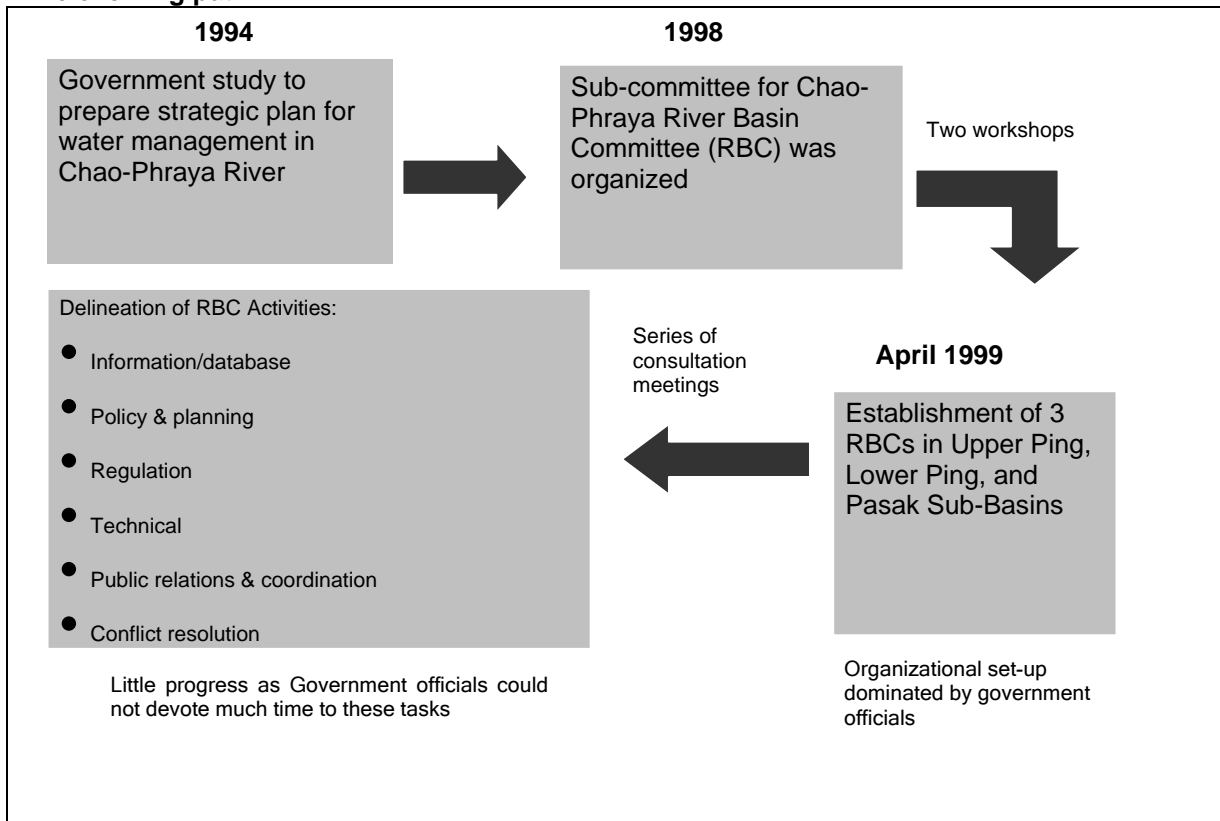
The establishment of RBCs started in 1994 with a study to prepare a strategic plan for water management for the Chao-Phraya River. The Chao-Phraya River is the most important river of Thailand as it flows from the northern region down to the central region, passing through Bangkok, the capital of Thailand. The Chao-Phraya River provides water for irrigated areas in the central region, considered to be the rice-bowl of Thailand, and thus carries enormous economic significance in addition to supplying raw water for Bangkok industries and populations. Due to rapid industrialization, land conversion, housing development, and urbanization, the Chao-Phraya basin has encountered frequent flooding and water shortages, creating serious concerns about how to manage the basin's water resources more effectively and sustainably.

One of the key recommendations of the study was for the establishment of a Chao-Phraya Basin committee. However, given that Chao-Phraya Basin is very large with complex socio-economic dimensions, it was recommended to establish three pilot RBCs for its three sub-basins in 1999. Since then, the RBCs have gone through a process of evolution leading to the current organizational structure and status. This evolving process is described below.

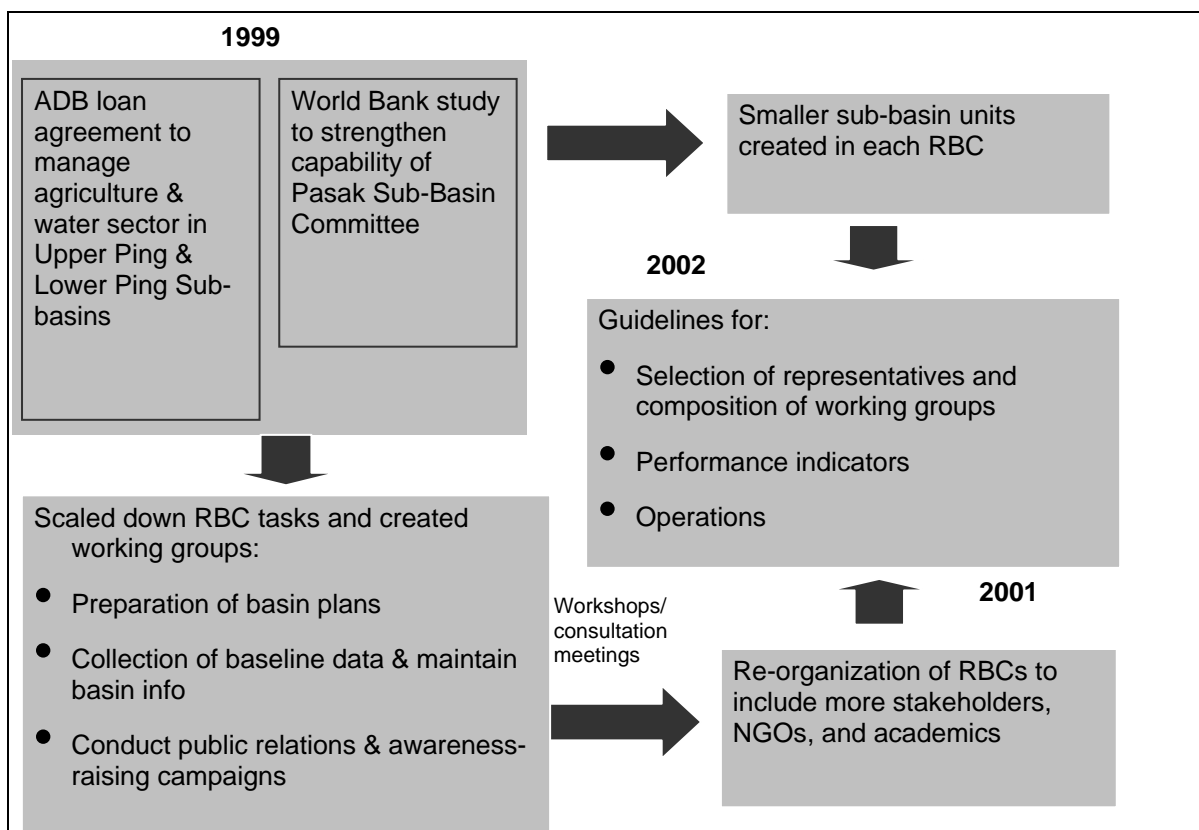
1. A study to prepare a strategic plan for water management in Chao-Phraya River recommended the establishment of the Chao-Phraya River Basin Committee in 1994. A sub-committee was formed to study the formation of Chao-Phraya RBC in 1995.
2. Three pilot RBCs were established in three sub-basins of Chao-Phraya - Upper Ping, Lower Ping and Pasak. The key responsibilities and functions of the pilot RBCs were agreed upon from a series of consultations and meetings. The members were mostly from government agencies, but this structure was inefficient because many government representatives were preoccupied with their other duties.
3. In 1999, the Government received a loan from the Asian Development Bank (ADB) for agriculture and water sector management, which included water management in the Upper Ping and Lower Ping sub-basins. At the same time, the World Bank (WB) supported studies to strengthen the management of the Pasak sub-basin. During these studies, a series of stakeholder consultation meetings were organized to discuss water management issues and mechanisms to strengthen the three pilot RBCs. Two key suggestions emerged as follows:
  - Reduce the functions assigned to the RBCs to focus only on three major activities, i.e. preparation of basin plans, collection of baseline data and maintenance of basin information,, and conducting public relations and awareness raising campaigns.
  - Reorganize the RBC structure to include more primary stakeholders as well as academics, and NGO representatives as members.
4. In 2001, more RBCs were gradually established with this new organizational set-up and new set of key responsibilities.
5. The Department of Water Resource was established in 2002 and one of its main tasks was to promote the establishment of RBCs in all major river basins based on lessons learned from the foregoing experience. Twenty-five (25) RBCs were established.

6. A series of changes to the structure of the RBCs followed, resulting in RBC membership comprised of mainly three groups of stakeholders: government officials; community stakeholders; and academics/NGOs. Normally, the government and community stakeholders usually had about an equal number of representatives in the RBC and academic/ NGO representatives comprised of 10 to 15 percent of total membership. This ratio of representation was to ensure that RBCs are not to be dominated by government officials. It should further be noted that in almost all RBC's the Chairman is the Governor of the main province present in the basin. Another important feature of the RBC structure is that members of the stakeholders were not appointed or nominated, but had to go through an internal selection process by which each user group selected their own representatives.

### The evolving path







### Analyzing the Evolutionary Process of RBCs

**DORMANCY.** Initial stage was characterized by top-down type of meetings and operation by government agencies and the Office of the National Water Resources Committee (ONWRC). Diversity of members without any real driver and with little inputs from stakeholders resulted in too little progress.

**TURNING POINT.** WB and ADB studies identified flaws in the existing set-up and catalyzed operations and efforts

**EVOLVING.** Establishment of participatory working groups made local stakeholders realize their important role in planning and decision-making processes

Participatory, grassroots involvement enhanced identification and development of locally appropriate models for river basin management

One can thus observe that the establishment of 25 RBCs coincided with the establishment of DWR in 2002. This was not a coincidence but a part of the design, as the very idea of establishing the DWR was to have a regulatory body with the task to manage water resources and also to integrate IWRM in the national water management process. DWR was originally designed to have nine regional offices with areas of responsibility more or less corresponding to river basin boundaries, e.g., each regional office overseeing two or more river basins depending on the size of the basins and their geographic locations. The directors of the regional offices were assigned to serve as secretaries of the RBCs. An office for the promotion of stakeholders' participation and trainings was also created within the DWR.

Lastly, there was no intention to control or dictate the development of RBCs. The RBC development process evolved with increased understanding of water resources management and implementation of IWRM. Currently, nine representatives of the 25 RBCs are members of the NWRC, which allows stronger linkages between national institutions to basin and sub-basin institutions.

## Yom River Basin case study

### Key factors for the Yom River Basin Pilot Project

- Selection of key stakeholders to be members of the working group
- Chairman and working group members from basin stakeholders played leading roles
- Resource persons maintained advisory and technical support roles
- Financial support for working group's activities

A pilot project on an Adaptive Approach to Implementing IWRM in the Yom River Basin was supported in 2008 under the Pilot and Demonstration Activities program for water (PDA) of the ADB. The objectives of the project were to test the application of adaptive management approaches to assist local government administrations, including the Yom River Basin Committee (YRBC), and civil society to implement IWRM principles in basin water resources management, and to foster a consultative process where the relevant agencies are able to cooperate and pool their resources to support IWRM initiatives sponsored by basin and sub-basin committees.

The Yom River was selected as the pilot basin for the following reasons:

- The basin has the least extensively developed water resources infrastructure of the major Chao-Phraya tributaries. It is the only one of the four tributaries of the Chao-Phraya River that does not have a large control dam upstream. Other medium and small structures are scattered and not interconnected, however there are plans for the development of new water resources infrastructure.
- The basin is subjected to emerging disputes between civil society and promoters of proposed water resources infrastructure projects. Notably there are a number of strong advocacy groups that oppose the proposal of the Royal Irrigation Department (RID) to build the Kaeng-Seua Den Dam. These civil society groups have formed a conservation network to protect the forest. In addition there are civil society groups downstream that want action taken to reduce flooding in Sukothai. However although there is potential for water related disputes, there is evidence that these two groups want to have a better dialogue and exchange of opinions with project promoters in order to solve water problems in the basin.
- There is a strong perception in the basin that there are too many studies and reports, called basin plans, commissioned by concerned agencies while the established YRBC seems not to agree with any of them. The gap between what the agencies and the YRBC desire revealed the need to facilitate a review of the problems, both upstream and downstream, by the stakeholders before formulating a new plan. The solution needs to be practical and set-by-step instead of attempting a comprehensive, externally driven, plan.

### Implementation approach

The introduction of IWRM principles at each step of the familiar project management cycle was expected to improve the planning, management, and use of water resources in the basin and overcome emerging water-related disputes. For project implementation, it was necessary to set up an effective management team comprising of representatives from key Government agencies, stakeholders from all the four major provinces in the Yom basin, and resource persons from the local university. After initial discussions between DWR, key stakeholders and the Thailand Water Resources Association (TWRA), it was decided to establish a Yom River Basin working group which comprised of ten members with four representatives from key government agencies (DWR, RID, Department of National Parks and Wildlife, and the Harbour Department), and six stakeholder representatives from the four major provinces in the Yom basin. Furthermore, to give more weight to local stakeholders, it was agreed that an abbot/ monk should chair the working group, while the Director of DWR region nine was made secretary with resource persons from TWRA and Nareasuan University.

Since the concept of the project focused more on basin management with the application of IWRM rather than basin planning, it was necessary to change the management approach of the project and to change

the mindset of those involved, i.e. the working group and selected stakeholders. Hence, the management approach was to undertake the project with two distinctive but parallel steps.

- Educate and raise awareness about IWRM in order to avoid misunderstandings. Some interpreted IWRM as a holistic planning approach which leads to the integration of other resources into a basin plan without much participation of stakeholders, while others interpreted stakeholder's participation as simply the need to inform stakeholders about basin plans and projects, without adequately engaging them in the entire process.
- Introduce IWRM in the implementation stage of the process. The implementation of the project followed an iterative, learning-by-doing approach, in which simple objectives were set, aligned activities carried out, and results discussed and analyzed. New ideas or objectives were set based on the results. Through a series of workshops and actual field activities, the project team brainstormed different ideas based on the realization and recognition of local conditions, aspirations, constraints and new options as provided by IWRM.

## Results of the pilot project

After two years of project implementation from 2008 to 2009, the following were achieved:

### Change in attitude and thinking

The process of organizing meetings with real participation from all stakeholders and key line agencies created opportunities for frank exchange and cooperation. Also with the raising of awareness about IWRM and the adaptive management approach, water management innovations emerged such that the sustainable management of water resources received more understanding and attention than its traditional development aspects. The creation of the Network of Sub-districts located along both banks of the Yom River facilitated the formation of a large group of stakeholders who share similar concerns and ideas, and are committed to addressing priority problems using local knowledge in managing water resources. At the same, time it allowed implementation of activities and projects in a more coherent manner from upstream to downstream.

### IWRM training

The IWRM concept was explained to the participants at the beginning and the process was applied throughout the project, significantly leading to key line agencies' understanding of the process and conscious, direct engagements and dialogues with stakeholders. This resulted in closer cooperation between stakeholders and officials from line agencies. Training on wetland rehabilitation, the role of change agents, and report writing were also conducted for the secretariat staff of DWR Region 9, with the aim of strengthening their capacity to serve the working group and to serve the YRBC as well. These trainings were all part of the need to provide "management instruments" for IWRM. The training outcomes clearly pointed to the necessity of conducting and institutionalizing more training programs for DWR region 9 staff to allow them to be more responsive change agents for the YRBC.

### Data collection and Yom Basin Information Center

The idea of creating a simple database from simple maps provided by each sub-district was to prepare a practical information system, which the stakeholders can easily understand and utilize. The priority issues identified as part of the database could be used as well for setting up joint projects between and among sub-districts, districts and Provinces. It was hoped that the process would eventually lead to integration of projects for the whole basin through close cooperation and better understanding of over all basin issues.

The activity started with simple data collection leading to the establishment of the Yom Basin Information Center. A three dimensional physical model of the Yom River was constructed with assistance from a lecturer and students from Nareasuan University. The Abbot, Chair of the working group, gave up office space for the center. In addition, simple maps were compiled and digitally stored. The information center is currently being used as a training facility for various stakeholders on water resources.

### Flood warning system

As flooding of the Yom River is one of the problems in the area during the wet season, the working group identified the need to set-up a simple flood warning network. The working group selected

eleven locations from the upper Yom to the Lower Yom that were deemed critical for observing water levels and measuring rainfall and two volunteers were recruited from each location or station. These volunteers underwent a one-day training on simple hydrology, water level, and rainfall measurement provided by staff from RID and Nareuan University. Simple rainfall measuring devices and paints were likewise given to the trained volunteers. To minimize cost, the pillars of bridges across the Yom River were used as staff-gauge for water level measurement by painting the measurement levels for recording purposes. The volunteers were required to take measurements of water level and rainfall each morning during the rainy season. The measurements were then sent through SMS to the information center. For this particular task the volunteers were provided with mobile phone cards (or in some cases a small amount of money to buy phone cards themselves) to communicate with the Information Center. Upon receiving the information from the 11 stations, the information was translated into water level at mean sea level and rainfall into millimeters and then plotted on a longitudinal profile as well as posted on the website. This proved to be a very simple and cost effective way of creating a stakeholder-managed flood warning system and basin information center.

### Network of sub-districts located along the Yom River

Once the Yom working group had realized the benefits and lessons learned from the pilot project, they decided that it would be beneficial to expand its coverage area and involve more stakeholders, and that creating a network of sub-districts located on both banks of the Yom River would be extremely helpful. The members of the working group contacted the leaders of the 98 sub-districts in the Yom River and invited them to meetings to discuss the benefits of such a network. At the same time, IWRM trainings were conducted for selected members of these sub-districts, who were also requested to provide simple maps of their areas as described. It also became apparent that to foster close cooperation between sub-districts on water-related issues, it was useful for each sub-district to sign MoUs with sub-districts upstream and downstream to undertake activities of common interest. One main activity identified in the MOU was to monitor and control water quality.

### Site visit to key existing projects in the Basin

The members of Yom working group were also members of the Yom RBC, and through their initiative, a field trip to visit selected project sites from the upper watershed area to the downstream areas was organized. Through these field visits, members of the Yom RBC were able to observe successes and failures of these projects, including drawbacks in engineering designs and management, and potential corrective measures. Finally, recommendations were submitted to higher-level decision makers to avoid repeating the mistakes.

### Youth water quality monitoring volunteers

The latest activity of the pilot project was to encourage school children from schools located on the banks of the Yom River to monitor the water quality of the river. About 10 school children from five schools were invited to a weekend camp together with supervising teachers. In addition to regular camp activities, the schoolchildren were taught the importance of forest cover, river ecosystem and simple water quality measurement techniques. At the end of the weekend camp, water measurement kits were provided to each of the participating schools by the Pollution Control Department (PCD), which also sent trainers to teach the measuring techniques. The activity will be expanded and the water quality data can be kept and shown on the Yom information website in the future.

## Lessons Learned

The case studies presented in the foregoing sections demonstrate the process to which IWRM principles were put into practice at the National, basin and local levels in Thailand. Key conclusions could be drawn from these case studies that are significant to IWRM implementation processes:

### A flexible work program and road map

The implementation processes demonstrated in the case studies were based on a loose and flexible work program which identified various steps to achieve the desired results but did not set a final target date for such completion. This is to emphasize the need to understand IWRM as a process and the need to integrate such a process into the implementation of water management systems. Such a flexible time frame was helpful in the change process among the involved stakeholders, as succeeding steps largely depended on the outcomes of previous ones. The utility of such a flexible approach was likewise demonstrated in the process of government endorsement of IWRM, from consideration of the NWRC, to

Cabinet endorsement, to integration in relevant line ministries' functions. If the "whole" IWRM process was shortened and presented as one package for government approval without the necessary lead up, the process would have certainly faced serious complications, such as clarity of the concept, buy in of stakeholders, usefulness and benefits of IWRM being established, among others.

The cases on the evolving RBCs and the Yom pilot project also supported the process of pursuing set targets and objectives while following a series of flexible steps based on the outcomes of the previous ones, akin to a learning-by-doing process. In such an approach, it is critical to keep the end in mind and ensure that everyone is fully engaged in the process that leads to an agreed destination. There are other factors to consider besides maximizing economic returns.

### Public participation and awareness-raising

Public participation and awareness-raising are essential activities for strengthening ownership and gathering support of relevant stakeholders. However, public participation has to be organized in a genuine fashion that provides all participants the opportunity to express and integrate their concerns and ideas into the IWRM process. Traditional and convenient public participation processes whereby stakeholders were more on the receiving end rather than on the giving end had been seen to eventually lead to increased conflict, confusion and misunderstanding. Engaging stakeholders at all stages of the process is essential.

Public participation and awareness-raising were among the main activities in the case studies, so stakeholders felt they were in control of the process and were therefore fully supportive of pushing it forward. Such an important process naturally requires adequate funding, which in the case of Thailand was provided partially by donor organizations to start the process. The engagement of donors and the government for such financial support is very helpful. The process likewise saw challenges in some government agencies providing the required financial support, given other priorities and commitments, and thus there was a need for external support in some instances.

### Establishing champions and core groups

In any advocacy or promotional campaign, advocates or promoters serve as the driving force to achieve the identified goals. For IWRM, the principles are the same although the tasks and required dedication of the advocates would take a different form. IWRM advocates face more serious challenges compared to product promoters in that they are not only selling a product or an idea, but are introducing a new concept into an existing water management system, thereby weaning stakeholders away from their usual roles and comfort zones. There are usually no financial rewards for IWRM advocates. The advocates play the role of "champions", a network or group of people who firmly believe the value of the IWRM approach, and who have the conviction to avoid losing focus of the goal by keeping the end in mind. Consistency and patience are required given the potentially lengthy process, as well as linkages to other relevant networks in and outside of the country. Stakeholder engagement capacities are crucial, as the champions need to be able to communicate messages clearly to community level stakeholders and to high level decision makers in the system.

The champions need to be supported by a core group of individuals who share the same belief and convictions, and who will assist in pushing for change in their respective capacities. Awareness raising activities, learning events, and workshops have proven to be very useful tools in the pursuit of the Thai case studies. This success was due to a large group of diverse stakeholders who, convinced of the benefit of putting IWRM into practice at various levels, rendered committed service and effort in promoting the process. Such a group of committed stakeholders is critical to spreading the IWRM concept and pushing for its implementation.

### Networking and empowerment

With government endorsement or approval of IWRM in place, it is necessary to implement activities to ensure that such endorsement brings positive change. Networking among stakeholders is very important to create the momentum needed for such an undertaking. This also increases chances of gaining acceptance and ownership at various levels.

Empowerment parallels networking. When a new approach or system is accepted and people are ready to put it to the test, it is important to ensure that "new" entrants into the system (e.g. water users) are empowered by the traditional duty bearers (e.g. government) to be able to exercise and introduce innovations to make the approach work for their own benefit, based on their respective context and situation, that is, to ensure IWRM creates a real impact on their livelihood. By doing so, local stakeholders would learn and understand the system through their own practice and integrate IWRM firmly in all levels of water resource management.

## Changes as indicators of the success of IWRM

With global recognition and commitment to IWRM come more questions. Besides questions about “what is IWRM?” and “how do we put IWRM into practice?” another question is “what comes next?”. Admittedly, IWRM as a process is somewhat abstract, and the outcomes or results are not easily quantifiable. Obviously, the expectation is that with IWRM, the water resources would be managed better, but, in reality, measuring such success is easier said than done.

From the Thailand case studies, many changes were observed during the course of the projects implementation. For example, in the case of the Yom Pilot project, initial discussions with stakeholders on basin water management mostly focused on a long wish list of infrastructure projects. After two years of pilot project implementation however, stakeholders have begun to concentrate more on resolving key issues through management tools and instruments, rather than infrastructure-type support. Stakeholders have begun to realize that solutions to a number of water issues resided in them and that through regular dialogues they could jointly apply such solutions when necessary without relying on external interventions. One important achievement has been resolving serious conflicts between stakeholders from the upper Yom (who opposed the construction of Kaeng Suea Den Dam) and stakeholders from Low Yom (who favored the dam construction). Currently, the dam construction is no longer a top priority, with alternatives being considered by the stakeholders through open dialogues and discussions. In the case of the evolving RBCs, government agencies previously did not expect much from stakeholder representatives in the committee in performing their duties. Stakeholder representatives themselves had little knowledge about their role and the significance of basin plans. After years of experience through the pilot project, many stakeholder representatives are now eager partners of the government and have continued to contribute tremendously in the deliberation and review of RBC plans as well as the national policy.

Lastly, proper implementation of IWRM must bring about change. These changes occur in the mindset of people at all levels, in institutional mandates, functions, and operations, and in management approaches.

## Recommendations

The experience of Thailand in putting IWRM into practice hopefully could provide lessons for others to map out their own strategy for IWRM. However, it must be pointed out that the approach and success of the process are influenced by the political, social, economic and cultural conditions of each country and therefore the Thailand experience could provide options for consideration. Nevertheless, some key recommendations are offered as follows:

### No standard procedure or blue print

Putting IWRM into practice requires integrating its key elements. It does not matter which elements come first, as long as most elements are eventually phased in, following an opportunistic approach depending on the emerging situation. It can be compared to making a jigsaw puzzle, where one has to try to put all the pieces together without a standard format or sequence. A strategy or plan will help, but will have to be flexible to respond to the evolving situation.

### Obtain endorsement from the highest level

The implementation of IWRM gains prominence and support with endorsement of the highest policy level, and with the strong backing of stakeholders and champions. This is to ensure that IWRM principles are integrated into the existing water management system.

### Consistency and continuous effort

The implementation of IWRM could take a long time, and therefore the need for consistency in pursuing the goal through an effective implementation process is important to avoid derailment. At the same time patience and continuous efforts are equally important in pursuing the results chain, which means creating the right environment for these results or changes to occur.

### Promoters and champions

Advocates and champions – both individuals and groups representing prominent, respected and committed persons are very important to act as catalysts to accelerate the IWRM process, particularly in complex, bureaucratic environments. Such advocacy and networking likewise needs a good strategy in itself, to ensure that all champions are delivering the same messages, and reaching the target audiences.



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