



NARBO: A DECADE OF ACHIEVEMENTS (2004–2014)

PROMOTING INTEGRATED WATER RESOURCES MANAGEMENT AND IMPROVING WATER GOVERNANCE



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Foreword



The publication of this report commemorates the 10th anniversary of the founding of the Network of Asian River Basin Organizations (NARBO). In February 2004, NARBO held its inaugural meeting in Batu, East Java, Indonesia. I had the good fortune to be present on that historical day to bear witness to the birth of NARBO, conceived almost a year earlier with the signing of a letter of intent between the Asian Development Bank (ADB), the Asian Development Bank Institute (ADBI), and the Japan Water Agency (JWA) during the 3rd World Water Forum held in Kyoto, Japan in March 2003.

From this humble beginning, NARBO has grown leaps and bounds over the past decade and has matured into a respected, high-profile international network at the regional and global level. In the course of the last 10 years, the initial membership of 43 organizations from 11 countries has almost doubled to 84 organizations from 17 countries, and, with many more applications in the pipeline, this number will continue to grow. The first half of the decade was devoted to building up capacity among the members as they work toward implementing integrated water resources management (IWRM) in their river basins. Through these efforts, many of the member organizations have evolved into leading examples of successful and competent river basin organizations. The second half of the decade was a period of consolidation and strengthening of the governance structure. NARBO has put in place a steering committee to provide the vision and direction as well as a management team to turn this vision into reality. My congratulations to NARBO on a job well done!

To excel, an organization needs to constantly monitor the pulse of its stakeholders and strive to meet their aspirations. With this in mind, NARBO organized a “gathering of the clan” in Manila, Philippines in November 2014 to commemorate its 10th anniversary as well as to reflect back on the achievements thus far and identify the future direction for the coming years. The outcome of this brainstorming has been captured in the section “Voices of the Members” and will be used to plot the future strategic direction of NARBO.

It has truly been an exciting and fruitful first decade for NARBO and I would like to extend my thanks and appreciation to all NARBO members for their continued participation and

support to bring NARBO to where it is today. Your valued input has helped improve and enhance NARBO's role and moved us closer to achieving IWRM in our respective river basins. I am also grateful to the steering committee and the management team for their invaluable advice and contributions, and to our secretaries-general, past and present, for their dedication and hard work and who together with the secretariat staff have been the backbone of NARBO's success. Finally, I would like to thank the editorial team for their excellent work in putting together this publication.



Keizrul Bin Abdullah
Chairperson, Network of Asian River Basin Organizations
Saitama, Japan

Abbreviations

ADB	Asian Development Bank
ADBI	Asian Development Bank Institute
AWDO	Asian Water Development Outlook
BBWS	Balai Besar Wilayah Sungai (Indonesia)
CRBOM	Center for River Basin Organizations and Management (Indonesia)
DUWRMT	Dissemination Unit for Water Resources Management and Technology (Indonesia)
GWP	Global Water Partnership
HELP	High-Level Expert and Leaders' Panel
IWMI	International Water Management Institute
IWRM	integrated water resources management
JICA	Japan International Cooperation Agency
JWA	Japan Water Agency
LLDA	Laguna Lake Development Authority (Philippines)
LOI	Letter of Intent
MASL	Mahaweli Authority of Sri Lanka
MOU	memorandum of understanding
NARBO	Network of Asian River Basin Organizations
NEC	National Environment Commission (Bhutan)
OECD	Organisation for Economic Co-operation and Development
RBO	river basin organization
SWMA	Selangor Water Management Authority (Malaysia)
UNESCO	United Nations Educational, Scientific and Cultural Organization

SNAPSHOTS OF NARBO ACTIVITIES (2004-2014)

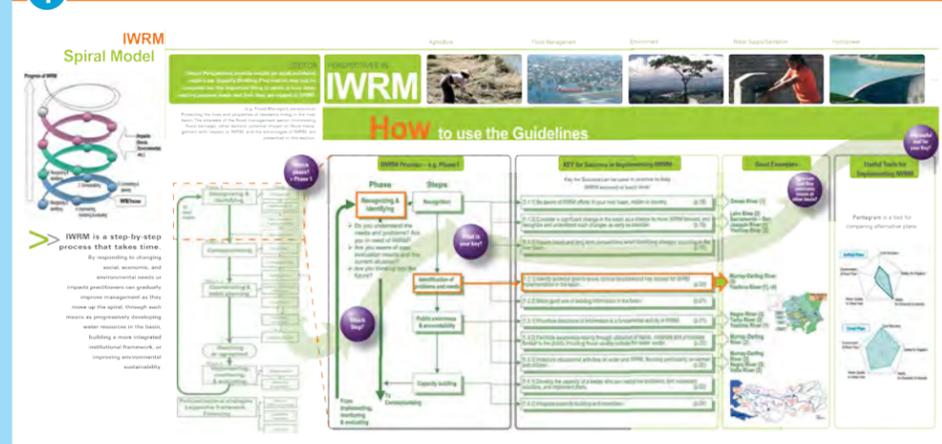
2 Third General Meeting on 20-22 February 2008 in Surakarta, Indonesia



3 Ninth IWRM Training on 12-19 May 2014 in Manila, Philippines



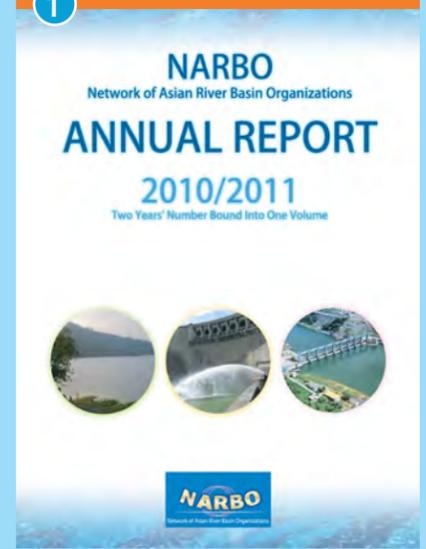
4 IWRM Guidelines



8 LOI Signing at Third World Water Forum



1 Annual Report

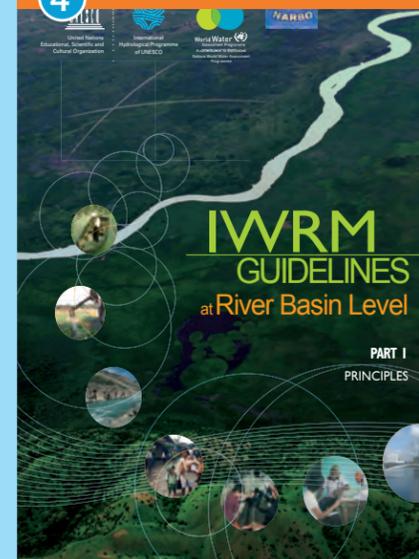


Trails of NARBO Activities from 2004 to 2014

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Awareness Raising												
NARBO General Meeting						2						
IWRM Training												3
UNESCO IWRN Guideline									4			
Thematic Workshop									5			
RBO Performance Benchmarking											6	
Online Training Course												7
Twining Program												7
GM & Capacity Building												
World Water Forum	8										9	
Asia-Pacific Water Summit												
Southeast Asia Water Forum												
UN Special Event on Water and Disaster												
HELP on Water and Disaster												
OECD Water Governance Initiative												
Promotions												
Website, Newsletter, and Annual Report												

Note: The numbers accompanying the images are corresponding to the numbers indicated in the table of "Trails of NARBO Activities from 2004 to 2014."

4 IWRM Guidelines



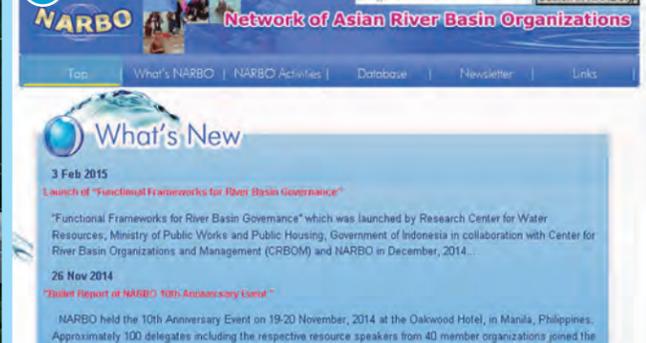
1 Newsletters



6 Performance Benchmarking, Sri Lanka



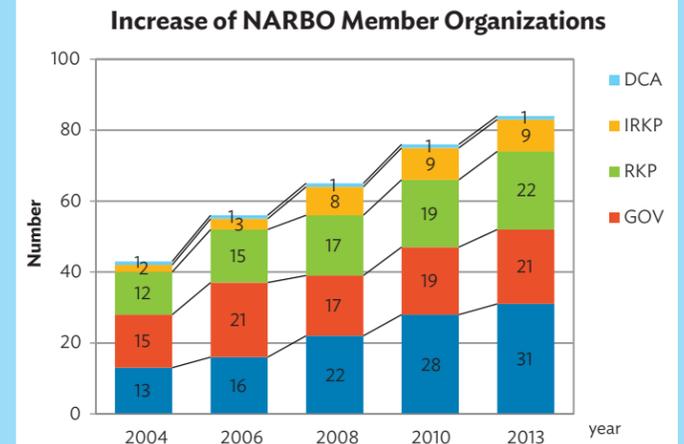
1 Website



7 Twining Program, Japan



Number of NARBO Members



5 Thematic Workshop, Philippines



9 6th World Water Forum



Message from the Japan Water Agency



I would like to convey my congratulations on the launch of this publication summarizing 10 years of activities of the Network of Asian River Basin Organizations (NARBO). I am very happy to see the many concrete achievements by NARBO members in this report.

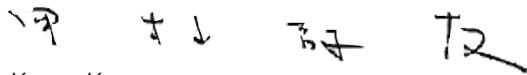
Since the launch of NARBO, we have been working together to achieve the network's goals of disseminating the concept and practice of integrated water resources management (IWRM) at the river basin level. Looking back at the past decade, our society and surrounding situation have drastically changed and continue to become more complex at an even more rapid pace. Still, NARBO has yielded successful results in promoting IWRM. This is thanks to the able leadership of NARBO, especially the strong and continuous support by the founders of NARBO as well as the Government of Indonesia and Government of Sri Lanka. My sincere gratitude goes out to all those who have contributed to NARBO.

There have been many recent water-related disasters of unexpected scale in the world, including Japan. By mobilizing our some 50 years of accumulated experience in civil engineering, operation and management of water-related facilities, and coordination among water users, the Japan Water Agency (JWA) has been working to reduce the damages caused by floods and drought. We have also contributed to the economic development of Japan and improved the well-being of its people by supplying sufficient water to meet demand. As regards river basin projects, JWA has prioritized consensus among basin stakeholders and building confidence through steady and reliable implementation of water resources management. We have shared our experiences in Japan and Asia through NARBO and other global frameworks.

At a side event of the 2013 United Nations Special Thematic Session on Water and Disasters, I reported on the water resources management situation in Asia and stressed the necessity of applying IWRM to address emerging water-related disaster issues. Furthermore, I emphasized the importance of preparedness based on past experience. Underlining my points, the 2014 Intergovernmental Panel on Climate Change Fifth Assessment Report states that "water scarcity is expected to be a major challenge for most of the region as a result of increased water demand and lack of good management." The Open Working Group on Sustainable Development Goals similarly proposed by 2030 to implement IWRM at all levels, including through transboundary cooperation,

to ensure water availability and sustainable management of water. For this, we need to develop new tools to measure the progress of IWRM and shift the focus to efficient IWRM implementation methods. Therefore, the role of NARBO is expected to increase. To meet these expectations and secure the sustainability of NARBO activities, we request the active contribution and innovative actions of all members in the next stage of NARBO's evolution.

It is my hope that this flagship knowledge product will add great value to NARBO and the water community by disseminating widely the rich experiences contained not only within the NARBO member organizations but also in other water sectors around the world.



Kenyu Komura
President, Japan Water Agency
Saitama, Japan

Message from the Asian Development Bank



Asia has enjoyed a decade of remarkable economic development, urbanization, and population growth which has led to an increased demand for water, which is now culminating in serious water security challenges. Asia is home to 60% of the world's population yet has only 36% of global freshwater resources.

According to ADB's *Asian Water Development Outlook 2013*, about 75% of the the Asia and Pacific region is categorized as water insecure. The region will become increasingly insecure with continued population growth placing additional demands for food, energy, and drinking water. The backdrop of climate change poses a daunting future and the challenges faced for sustainable development are immense.

According to the 2015 *Global Risks* report by the World Economic Forum, the water crisis is the world's most impactful risk. It is critical for the region to manage water resources and river basins in integrated ways that promote sharing of water resources while preserving the environment.

ADB recognizes that integrated water resources management (IWRM) is a comprehensive, adaptive, and participative approach to harmonize all water users to cope with emerging basin challenges. These include climate change, water-related disaster risk management, and increased demands from all water users. IWRM has been adopted by many governments across the region; however, its implementation in the developing countries is still a challenging task.

Accelerated and expanded implementation of IWRM comprises one of the outcomes of ADB's Water Operational Plan (2011–2020), and the Water Financing Program (2006–2020) targets introduction of IWRM principles in 30 river basins across the region. ADB encourages introduction of IWRM to its developing member countries as an essential process for increasing water security and sustainable development supported by equitable, efficient, and eco-friendly use of water.

I am pleased that a decade ago, ADB together with its partners, the Japan Water Agency and ADB Institute, took a leading role in recognizing the region's water security challenges and launched the Network of Asian River Basin Organizations (NARBO) to contribute to improved water governance and capacity building for IWRM.

In its early days, NARBO focused on promotion and awareness raising of IWRM to basin practitioners across the region. NARBO activities further evolved to the delivery of a wide range of capacity development programs for IWRM, development of river basin organization performance benchmarking, and tangible knowledge products. In recent years, NARBO has taken on a more leading role in IWRM in Asia and strengthened its presence in the global arena as a network of basin practitioners.

In November 2014, ADB was honored to host the 10th anniversary of NARBO in Manila, Philippines. We celebrated this milestone event of a river basin practitioner's network for IWRM and water governance with 82 participants from 19 countries.

The messages and conclusion of this publication reflect discussions during the anniversary event and the future direction of NARBO. What is special about this book is that it includes a collection of "voices" from practitioners who have been engaged in the promotion and implementation of river basin management under the principles of IWRM. Each of these voices provides a meaningful and insightful view of IWRM based on rich experiences as water practitioners. These real life accounts of how to bring IWRM into practice adds unique value to this publication. The collected voices lead the readers to envisage the impact of the NARBO activities to river basin management practices and evoke confidence in the IWRM approach for improved water governance. Whilst the path ahead remains challenging, the pioneering steps taken over the past 10 years to embed IWRM within the region will hold us in good stead for working towards a more water secure Asia.

I would like to express my sincere salutations and appreciation to those who have devoted themselves to promoting the IWRM approach in Asia through NARBO's activities. ADB continues to be a strong supporter of NARBO and works closely with the NARBO Secretariat to guide planning and implementation of NARBO activities.



Bindu N. Lohani
Vice-President (Knowledge Management and Sustainable Development)
Asian Development Bank
Manila, Philippines

Message from the Asian Development Bank Institute



Water is important not only for daily household living, but also for industrial production and transport by use of rivers. It is furthermore central to hydroelectric power production in dams. Without stable water security, the prosperity of Asia and the Pacific cannot be achieved.

According to the *Asian Water Development Outlook 2013* (AWDO), “more than 60% of households live without safe, piped water supply and improved sanitation” in Asia and the Pacific. Particularly, the problem of water pollution is putting

greater pressure on the water environment. It also shows that “waste water is often released into rivers, lakes, and groundwater untreated or only partially treated” in the region. These are overt impediments to economic growth. Moreover, water may cause enormous damage in the form of floods or drought due to climate change. While flood damage caused by typhoons is well known, AWDO also reports that “90% of the people affected by water-related disasters live in Asia.” This means great losses of property and damage to economic growth are very likely when a disaster occurs in this area.

These facts clearly confirm the need for continuous improvement in these water-related areas. Construction of piped water lines will enable women and youths time to pursue income-generating activities and/or studies. Increasing treated water will greatly contribute to countries struggling with water scarcity. In addition, better preparedness for water-related disasters prevents further loss of livelihood and national wealth. Focusing on and addressing water problems is closely linked with betterment of the economy and might even be a prerequisite for future growth.

In order to ensure that economic growth is stable and sustainable, efficient frameworks should be created to coordinate among stakeholders and to reinforce disaster prevention and resilience in each country and river basin. And such frameworks will need to be implemented as soon as possible.

The Asian Development Bank Institute (ADBI) seeks to be the recognized leader in the creation and sharing of knowledge on economic development in Asia and the Pacific. For this purpose, it conducts research as well as capacity building and training activities that support the overall objective of the Asian Development Bank (ADB), namely poverty reduction.

From this point of view, ADBI concluded an agreement in 2003 with ADB headquarters and the Japan Water Agency to support the Network of Asian River Basin Organizations (NARBO). Since then, we have provided capacity development opportunities for mid- and senior-level officials and/or engineers of water resources management organizations such as river basin organizations and the government in accordance with ADB's water policy.

Problems of water resources management in this region still remain, bound to become much more complicated as the regional economy grows. Therefore, I expect NARBO to contribute more to finding solutions to the current issues on water in the near future.



Naoyuki Yoshino
Dean, Asian Development Bank Institute
Tokyo, Japan

Introduction

Importance of Water Security

Water security is fundamental to human lives, society, and economic activities in several aspects, including livelihood, health, food, energy, environment, and resilience against water-induced disasters. In other words, water security has to be ensured at all levels from households to communities, cities, river basins, and national economic sectors for their sustainable development. It has thus become a pressing issue for governments, political leaders, water users, and practitioners alike all over the Asia and the Pacific region.

Since water security is multifaceted, the list of technical challenges includes but is not limited to increased incidence of floods and drought, degradation of water quality in surface and groundwater, loss of ecosystem services, poor condition of water resources infrastructure, lack of experience and institutional capacity for water allocation, and generally weak governance systems in water services delivery and water resources management.

Studies carried out during the preparation of the *Asian Water Development Outlook 2013* (AWDO) concluded that more than 75% of the 49 countries or regions in Asia and the Pacific are seriously exposed to imminent water constraints. To increase water security for all stakeholders, an integrated water resources management (IWRM) approach is needed that reaches across sectors and jurisdictions as well as coordination within a sector.

Many of these countries and regions, home to over 90% of the the population of Asia and the Pacific, are faced with water security issues. A core finding of the AWDO is that countries with better water governance generally have higher water security. The region's water reality and outlook is such that it requires a multipronged approach tackling the issues head on, coupled with greater integration of stakeholders in problem solving.

Significance of Integrated Water Resources Management for River Basin Management

The concept of IWRM emerged in the early 1990s and became more accepted through a series of seminal international events and reports including the 1992 International Conference on Water and the Environment in Dublin as well as the 1992 Rio Earth

Summit (United Nations Conference on Environment and Development) and its Agenda 21 action plan.

The IWRM concept is based on sound principles and is a vital requirement for water governance. It boosts water security by helping leaders break through the deadlock, spanning boundaries, and creating a positive nexus among water, food, and energy security. Box 1 explains how IWRM is defined and incorporated in policy frameworks.

The IWRM concept will be a guide for river basin managers to conduct their work on river basin water in an equitable and transparent manner through timely coordination with the right stakeholders. It is important for the practitioners and decision makers within institutions to understand that while one cycle of the IWRM process might look lengthy and iterative, it need not be prescriptive. The IWRM approach will help river basin managers and staff to (i) better understand the basin profile and pay attention to its weaknesses and threats, (ii) define priority and/or demonstrative actions that can be carried out immediately, (iii) build implementable steps to address the most urgent issues and take advantage of opportunities for their implementation (e.g., provisional informal multi sector platforms, investment plans, and capacity building); and (iv) formulate a strategic road map for improving water governance to proceed IWRM. Situation-specific and relevant elements can be isolated to achieve results. Box 2 shows example of IWRM interventions in river basins in Nepal and Indonesia.

For example, water accounting is a valid exercise providing the basis for understanding water productivity and utilization by various sectors. The overall IWRM process requires simplification to increase understanding and to operationalize the process. Other examples of challenges, among others, include difficulty in prioritization, lack of financial inputs, inconsistency within actions or investments, and lack of coordination among relevant sectors and stakeholders.

The main focus of the Network of Asian River Basin Organizations (NARBO) is river basin management, and river basin organizations (RBOs) play an important role in strengthening the governance of river basin management. Compared to entities organized by geography or sector, RBOs can more equitably and effectively coordinate stakeholders in a river basin concerning water use and river administration. In addition, river basin management knowledge and tools can be accumulated within each RBO and among its staff, making it easy to apply good practice across the whole basin. RBOs are therefore key players in improving IWRM in the basins. With this in mind, NARBO has always prioritized the capacity building of RBOs.

Box 1: Definition of Integrated Water Resources Management (IWRM) and Related Policy

As defined by the Global Water Partnership: “IWRM is a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.” (A. Agrawal et al. 2000. Integrated Water Resources Management. TAC Background Papers No. 4. Stockholm: Global Water Partnership.)

As defined in the Asian Development Bank’s (ADB) Water Policy: IWRM composes a pillar of ADB’s Water for All policy (2001), which states that “integrated management will be based on conducting comprehensive water resource assessments, and concentrating interlinked water investments in river basins.” It is a core activity in ADB’s Water Operational Plan (2011–2020) and a target area in ADB’s Water Financing Program (2006–2020). To build on these initiatives, ADB’s Water Financing Program gives priority to embedding the IWRM process in river basins, and in urban and rural areas within these basins.

As defined on the Global Agenda: IWRM is enshrined in the United Nations Open Working Group proposal for Sustainable Development Goals under the Water Goal: “by 2030 implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.” The Water Governance Initiative hosted within the Organisation for Economic Co-operation and Development includes “improved IWRM” as one of its water governance targets to be achieved in the next decade.

Box 2: Water Security Issues and Integrated Water Resources Management Interventions

Nepal, Bagmati River Basin

Rapid and unsustainable urban development in the Kathmandu Valley during the past decades has jeopardized water security.

Main issues:

- (i) Water availability does not cover the needs of the rapidly growing population of Kathmandu.
- (ii) Overuse of groundwater is not sustainable and puts the city at risk of water shortage in the future.
- (iii) Since almost no wastewater treatment facilities and no environmental flow during the dry season, the ecosystem of the river environment is deteriorated and the river became a “dead river.”
- (iv) Several floods have affected the lower reaches of the basin.
- (v) No river basin organization (RBO) has been established.

Indonesia, Solo River Basin

The legal and institutional framework has been set up recently. It is indispensable for RBO and government officials to switch their mind-set from that of construction officers to that of the water managers who shall seek stable, safe, and efficient water management.

Main issues:

- (i) Limited water supply management for irrigation systems is causing unbalanced sharing of water and potential conflicts.
- (ii) There are weaknesses in the security and efficient operation of water facilities.
- (iii) Flash flood risks have increased due to degradation of upper parts of the watershed (deforestation and soil degradation). Severe sedimentation is also a big issue in the basin.

continued on next page

To cope with water security issues, the integrated water resources management (IWRM) process together with water governance tools are indispensable, as shown in the following figure:

Framework for Addressing Water Security through IWRM Process



IWRM = integrated water resources management.

Source: ADB. 2013. *Technical Assistance Partnership Agreement Final Report: Supporting Investments in Water Security in River Basins*. Manila.

Driving Forces Underpinning the Launch of NARBO

Countries in Asia share a series of common features with regard to their water environment, which makes it possible for water managers across the region to benefit from each other's experiences.

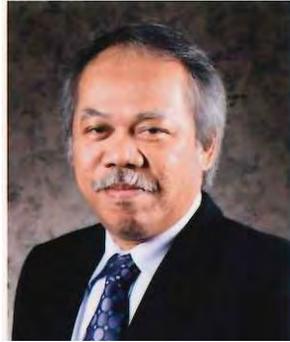
Among these noteworthy features, the first is that the region is climatically located within the monsoonal zones with warm humid climates. Generally, river gradients are steep, and there are clear wet and dry seasons, characterized by concerns of both too much water and too little water.

The second feature is that on river banks rice cultivation is practiced on paddy fields located near river mouths with population and properties highly concentrated in the megacities alongside the river course. Hence, the region suffers from recurrent floods in the city area and drought in the paddy fields.

Third, countries in the region share a common economic growth context. Over the past few decades, these countries have embarked on a rapid economic growth trajectory, and authorities overseeing their water sector have had to contend with the ever-growing water demands for domestic, industrial, and irrigation uses. In addition, the region's river basin managers have to cope with water-induced disasters and environmental issues that are exacerbated by economic growth and ever-higher concentrations of populations in megacities.

With these common features prevalent in Asia, the sharing of experiences from the developed countries of the region is deemed useful to others in the region. The intent is to capitalize on the region's existing strengths to create a platform whereby members can transfer their keys to success—how they have struggled and overcome similar issues. With this in mind, the Asian Development Bank (ADB), the Asian Development Bank Institute (ADBI), the Japan Water Agency (JWA), and developing countries in Asia seized the opportunity of the 3rd World Water Forum in Japan to address the shared need within Asia. And hence, NARBO was born.

Voice from Core Member on NARBO's Achievements



Basuki Hadimoeljono: Minister of public works and housing, Indonesia; senior advisor and first and second NARBO chairperson (2004–2008)

“NARBO’s biggest achievement has been to bring the spirit of integrated water resources management (IWRM) into the management of water in river basins. When NARBO was launched in 2004, IWRM was a rather new concept and not many countries in Asia had river basin organizations (RBOs) to cope with river basin management. So NARBO brought the IWRM spirit to the river basins. With the support of the Japan International Cooperation Agency (JICA), we formed a center of excellence in Indonesia called the Dissemination Unit for Water Resources Management and Technology. It was established in Solo and provides support not only for RBOs in Indonesia but also for the RBOs in Asia. In the early stage of NARBO, we developed more than 50 training modules and trained staff of RBOs. We did not ask JICA for consultants but worked together with the Japan Water Agency (JWA) on the program.

Now, 18 countries have joined NARBO, so we have to take care of NARBO for their sustainability. We cannot stop. It means that water management people need NARBO. NARBO also introduced the concept of benchmarking with the support of the Asian Development Bank Institute and it is a very useful initial step for managing IWRM.

The network itself is an advantage of NARBO. We can learn from network members who have similar cultures. We can share knowledge and experiences, and that is one of the most important achievements of NARBO. It is the different from consultancy support. The responsibility and ownership of members is important. NARBO is our organization, our network, so member countries must be more active. To promote ownership, the national secretariat has an important role to play and each country should activate its national secretariat to remain actively involved.”

Voices from Leaders Engaged in NARBO's Formulation



**At Preah Vihear,
Cambodia, Nov 2013**

Tsuneaki Yoshida: Professor emeritus of Tokyo University, former Asian Development Bank staff (1981–1997), chair of NARBO's inaugural bylaw setup meeting at Batu (Indonesia) in 2004, and the first senior advisor to NARBO

“The idea of NARBO stems from a telephone call from Dr. Fukuda, the then executive director of the Japan Water Agency (JWA) in July 2002. He wanted my advice in seeking a good topic to be presented by JWA at the 3rd World Water Forum in Kyoto in March 2003. I replied to him that it would be appreciated if JWA could present and share with developing countries its hardworking experiences

in integrated water management in seven basins in Japan since its establishment in 1962. Following this talk, JWA immediately organized a team of around 20 young staff to prepare a workshop entitled ‘A Review of Comprehensive Water Resources Management in Japan’ to be presented at the 3rd World Water Forum in March 2003. This workshop gathered more than 200 participants, and motivated the Asian Development Bank (ADB), Asian Development Bank Institute (ADBI), and JWA to launch NARBO with the purpose of sharing and learning the experiences in water resources development and management in monsoon Asian countries.

I recall my farewell speech at the ADB senior staff meeting when I left in December 1997. My speech emphasized ADB's future mission in providing more regional public goods in Asia so that ADB itself could be recognized as a ‘regional public goods/institution’ of the people, by the people, for the people in Asia. Regional public goods could be understood as part of ‘global public goods’ defined by Inge Kaul of the United Nations Development Programme in 1999. The typical examples of Asian regional public goods are the Asian highways, the power transmission line crossing the border between Thailand and the Lao People's Democratic Republic since 1971, and the water supply from Malaysia to Singapore, among many others. However, compared with other regions in the world, Asia is seriously lacking in regional public goods, regional institutions, and regional common policies, which have been obstructing effective movement and utilization of resources within the region. Provision of regional public goods in Asia could be one of the best means to achieve prosperity and peace in the region. In other words, regional prosperity and peace will end up with adequate provision of regional public goods including various kinds of regional institutions and infrastructure. Infrastructure was used to show patriotism or nationalism in the past, as was practiced in Europe. For example, railway track gauges and signal systems were all different from country to country, clearly intended to prevent invasion from neighboring countries because railways were the only means to carry heavy weapons, powder, and soldiers altogether. But, nowadays, European countries are well connected by such transnational infrastructure as borderless

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transportation, cross-border energy exchanges, and water sharing with integrated systems. The provision of regional public goods in the European countries was certainly a prerequisite to achieving their union.

Another reason that motivated me to help promote the launch of NARBO rested with my firm belief, as mentioned, that NARBO would also be recognized as a regional public good or institution in the future. In the course of evolution of river basin organizations (RBOs) in member countries, some of them will naturally be extended to international river basin organizations, because about 40% of the land area in Asia is covered by international river basins. With water getting scarcer each year as a result of ever-increasing demand for water due to growth of population and production in the region, water disputes across national borders in Asia will be emerging and become more serious. Members of NARBO are expected to play an important role in taking part in international river basin management, which requires working together with the NARBO members of neighboring countries. I strongly believe that NARBO can play an important role in grouping RBOs into international river basin organizations in the process of their evolution, which will definitely contribute to regional prosperity and peace in Asia.”



Takeyoshi Sadahiro: Senior counselor of the Japan Water Agency (JWA), and first vice secretary-general of NARBO from JWA (2004–2006); engaged in NARBO’s launch in 2002–2004

“The idea of launching NARBO was born from a chat with two Japanese government officials and myself before the 3rd World Water Forum as the output of the session convened by JWA, ADB, and ADBI at the forum. Though the concept of integrated water resources management (IWRM) had been promoted in the past decade, its actual spread did not proceed. So we thought it would be worthwhile to share good practices of water resources management in Japan and other Asian countries throughout the region by establishing a platform for knowledge exchange and capacity building for RBOs in developing countries, which would support IWRM improvements and strengthen water governance of RBOs in a practical manner. At NARBO, RBOs sit in the driver’s seat while government and knowledge organizations participate as partners. The RBO is a key player for stakeholder coordination and practical water resources management in the river basin. Had we missed the 3rd World Water Forum opportunity and the growing momentum for better water resources management, NARBO would not have been launched. Firm in our belief, it was necessary to make the declaration to launch NARBO at the World Water Forum.

Following the World Water Forum, in order to honor our commitment for ‘NARBO to be established within 1 year,’ I went on a pilgrimage with a colleague to visit government water agencies and RBOs of Asia. We visited Cambodia, Indonesia,

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Malaysia, the Mekong River Commission, and Thailand, and were emboldened by the greater than expected response to NARBO's launch in the region. At the Southeast Asia Water Forum, held in Thailand in November 2003, we held a preparatory meeting for NARBO's launch, in the presence of national government leaders Apichart Anukularmphai, Basuki Hadimoeljono, and Keizrul Bin Abdullah, who strongly supported NARBO. Hence, NARBO was ready to be launched.

We then prepared the NARBO Charter. The thoughts underlying the charter are the following:

- (i) NARBO aims to be a platform and knowledge base of IWRM implementation at the river basin level among the members of public entities in Asia.
- (ii) Its main activity is capacity development of RBOs through exchange of information and good practices, training and workshops, and benchmarking activities.
- (iii) The first focus is on monsoonal Asia, which has issues of too much water and too little water.
- (iv) Obligations of the members are positive participation in the activities and submission of annual reports in view of IWRM progress of the organization. Members' ownership is indispensable to maintain and activate NARBO performance.
- (v) The network's activities are financed by JWA, ADB, ADBI, bilateral and multilateral agencies, as well as NARBO members.

JWA, ADB, and ADBI collaborated in holding the first General Meeting at Batu, Indonesia, the origin of the Brantas River in East Java. At the meeting in February 2004, 43 organizations from 14 countries participated.

The advantage of NARBO is that the activity is pursued continuously for as long as it is needed and also that we can exchange information such as good practices among members, which differs significantly from project implementation or consultant support work.

Based on the experience of the IWRM activity through NARBO, ADB, in cooperation with JWA, carried out a regional technical assistance project from 2010 to 2013 with the aim of enhancing water security in Asia. This project enabled governments and the water sector to capitalize on the region's experiences for the formulation of specific investment programs and capacity development programs to improve water security through IWRM process. This process is applicable to the promotion of IWRM in all NARBO member countries.

Finally, I truly anticipate the spirit of members to further advance our collective work at NARBO and also expect their active participation in NARBO."

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Wouter T. Lincklaen Arriëns: NARBO senior advisor, former vice secretary-general of NARBO (2004–2013)

“NARBO has made numerous contributions throughout the years on many fronts:

- (i) **ADB operations:** From a client perspective, clients receive financial assistance, policy advice, and training from ADB. But now, by joining NARBO, they can become part of a regional community of practitioners in the same area—doing performance benchmarking together, joining together in capacity development activities, learning from each other, and developing and aspiring to best standards. This is a new and additional way of learning on a peer-to-peer basis. This is an additional service that ADB clients have derived from associating with and becoming a member of NARBO. From an operational perspective, not all the work of strengthening the capacity of the RBO can always fit in a project. NARBO offers ADB the chance to look at capacity development over a longer period and how to adapt to changes by working both strictly within the project but also in the regional cooperation mode of ADB where clients can be stimulated and facilitated to work as peers together in cooperation among developing countries.
- (ii) **IWRM spiral model:** Through the spiral model of performance improvement and adaptation, NARBO has introduced a powerful new mindset and model to look at change as we keep on improving continuously. Importantly, the spiral model also looks back historically to see how IWRM was already practiced for so many years. The spiral model enables the RBOs to build on their strengths as they look into the future.
- (iii) **RBO performance benchmarking:** NARBO has set the quality standards in Asia for how RBOs should perform. We call this performance benchmarking. Applying this has been a great source of enthusiasm and staff engagement to make it actually happen. The three examples that have piloted this are the Perum Jasa Tirta I for the Brantas River Basin, the Mahaweli Authority of Sri Lanka, and the Laguna Lake Development Authority, who have done an outstanding job to introduce this method.
- (iv) **Private partnerships:** Increasing water security in river basins across Asia is a complex issue. It requires many people to work together. NARBO is engaging now with a broader circle of stakeholders. All of them can work together better—including, very importantly, business—as facilitated by the RBO in a process that delivers better results and clean subrivers, and that reduces risk.
- (v) **Types of RBOs:** NARBO has introduced to the region a classification, a way of recognizing the different forms of RBOs. The simplest form are the councils and committees, then at the intermediate level are government organizations or public-type RBOs and the like, and at the third level, the advanced level, are

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the corporate-type RBOs. NARBO has clarified which role is appropriate in which circumstance and how RBOs can progress from one to the other.

- (vi) **Working with specialized organizations:** To address specific technical issues in river basins, NARBO works with specialized organizations to deliver pioneering new approaches together with the local RBO. For example, in the Solo River in Indonesia, in the Bagmati River in Nepal, in the lower Mekong Basin, and in the Ferghana Valley in Uzbekistan, new approaches for water security planning in the basin as well as water disaster management were introduced, and are now being taken up by the RBOs in those countries.”

Joining Hands for Asia’s Rivers

As the recognition of the importance of IWRM increased, the lack of a network to assist Asian RBOs in the introduction and implementation of the IWRM approach became more apparent. Thus, at the 3rd World Water Forum in Kyoto, Japan, in March 2003, ADB, ADBI, and JWA signed a letter of intent to jointly launch NARBO in recognition of the need to cooperate and support RBOs so as to promote IWRM in Asia. Subsequently, the three organizations reached out to government agencies, RBOs, and other related organizations in Asia, enquiring about their intention to participate and soliciting their cooperation. Following the inception meeting in Chiang Mai, Thailand, in November 2003, NARBO was formally launched at the inaugural General Meeting in Batu, Indonesia, in February 2004 with an initial pool of 43 member organizations. A decade later, the membership had almost doubled to 84 member organizations, including RBOs; national and federal, provincial, or local government organizations; regional and interregional knowledge partners; and bilateral and multilateral development cooperation agencies. At the onset, ADB, ADBI, and JWA served as the joint secretariat. In 2013, the Center for River Basin Organizations and Management (CRBOM) was added to the joint secretariat (see Annex 1 for NARBO’s organizational structure).

Benefits of NARBO to River Basin Organization Members

RBOs play a key role in basin management. There is a great and urgent need for RBOs to network through NARBO to better address the multitude of challenges faced in the region’s river basins today. In addition, networking is a good opportunity for cost-effective learning based on the sharing of examples and good practices. It can also provide incentives for change by comparing performance against new standards or benchmarks. Networking among RBOs can help a new generation of water managers make IWRM a reality in the region’s river basins.

There are several benefits enjoyed by NARBO members. RBOs have been dispatching their staff to IWRM training and using NARBO training as one of their capacity development tools. Some RBOs have applied and incorporated the RBO performance benchmarking system to their organization and the peer review conducted by NARBO to further improve capacity of their organization. NARBO occasionally sends out a group of experts to visit RBOs as a consultant team for developing and enhancing projects on IWRM. In this way, member organizations not only have opportunities to get regional IWRM experience and expand their network but also receive practical services. The active contribution of member organizations yields more benefits to NARBO and other member organizations.

The Track Record: 10 Years of Activities and Achievements

In the past decade, NARBO has organized numerous activities and made numerous contributions toward the implementation of IWRM in Asia and the Pacific. These range from advocacy, awareness raising, and information exchange to capacity development, network support, and various contributions to the water sector in Asia and beyond.

Advocacy, Awareness Raising, and Information Exchange

Website

NARBO's website was developed reflecting the recommendations emanating from the consultation meeting with secretariat members and ADB specialists and launched in 2004. Successive secretariats have operated the website as a platform for sharing information on NARBO activities and also for sharing event materials. Website traffic is growing gradually and it is an influential source among members and water management practitioners.

Newsletter

There have been 24 issues of the newsletter to communicate with member organizations and disseminate NARBO activities to the water sectors outside the network.

Promotion

NARBO's activities have been introduced and disseminated using many channels such as international conferences and publications of member organizations. For details, see NARBO's Footprint in Asia and Beyond.

Annual Report

NARBO members have committed to submit annual reports to the secretary-general. Seven such reports have been produced between 2004 and 2011 and are available on the website. The annual report provides members an opportunity to report on the activities implemented, how their performance has improved over the year, and also how NARBO has contributed to their organization.

Social Network

NARBO makes use of social media to share news, knowledge, and RBO experiences. The NARBO Facebook and Friends Group pages are a means of reaching out to a wider audience, especially the youth and young professionals.

Capacity Development

IWRM Training

One of NARBO's flagship activities is the IWRM training. To date, a total of 216 water professionals from 17 countries have participated in the nine training events since the first one held in Thailand in 2004. For a detailed list of the training courses, see Annex 2.

The following are some of the highlights of the training courses:

- (i) The first training course covered, among many other themes, lessons from worldwide trends, in particular IWRM and Thailand's participatory approach and its success in institutionalizing the IWRM process through planning and budgetary instruments.
- (ii) From the fifth training course onward, *IWRM Guidelines at River Basin Level* has been introduced as the primary textbook. Trainees enhanced their understanding of IWRM and their capacity to produce an IWRM plan for their river basin. Many participants reported that the IWRM training, especially the IWRM spiral tool, has contributed immensely to producing IWRM master plans in river basins.
- (iii) In addition, what has been learned at the IWRM training courses is then shared with the staff of member organizations. For example, the Laguna Lake Development Authority (LLDA) established a committee consisting of the participants of past NARBO events to disseminate what they learned to their colleagues by conducting an information-sharing sessions and thereby increasing the capacity of all LLDA staff.

Contributions to Training from Sri Lanka

Four of the nine IWRM training sessions were conducted in Sri Lanka, hosted by the Mahaweli Authority of Sri Lanka (MASL) and the International Water Management Institute (IWMI).

In particular, MASL, whose jurisdiction covers an area over 10,000 square kilometers, the largest river basin in Sri Lanka accounting for nearly 40% of the land area, allocates bulk water to reservoirs within the Mahaweli area and beyond to ensure guaranteed water supply for all stakeholders such as for irrigation, hydropower, drinking water, and industrial requirements. MASL carefully addresses all IWRM aspects and consolidates the system by ensuring water security, water allocation in close consultation with all stakeholders, and the safety of the water infrastructure, as well as by building both the physical and human capacity of the institutions involved. Sri Lanka has a favorable environment and high spirit of elaborate water management to train water professionals on IWRM, which is why MASL has contributed greatly to the IWRM training.

Voice from Trainee of the First Integrated Water Resources Management Training

Herman Idrus: President director of Perum Jasa Tirta (PJT) II (Indonesia) and vice chairperson of NARBO (2013–present)

“Water resources management is usually taken as a technical approach for managing water. Formerly, I wrote some papers about water resources management from a technical point of view only, because of my engineering background. It is sometimes implemented in a partial or sectoral way. As a result, some approaches could not meet the challenges. Even if it could, it was only temporary and unsustainable. Later on, integrated water resources management (IWRM) was introduced as one of the approaches in tackling the challenges in managing this source of life.

To get a comprehensive understanding about IWRM, some training was conducted by several different institutions. Fortunately, I had the chance to join the first training session held by NARBO in 2004 in Thailand. I learnt that IWRM is not just technical. It also consists of people and water managers from a variety of backgrounds who have different experiences and approaches. These differences in their way of thinking should be integrated in a holistic way in pursuing sustainable water resources for our future generations. After completing this training, I gained so much information from the trainers and other participants. Not only that, I could also expand my network with other water practitioners. In short, the IWRM training opened up my mind and broadened my insight about water resources management. Since then, my point of view has changed drastically. I started to think that water resources should be managed in a holistic way to ensure sustainability.

Managing water resources in a sustainable way has been our main concern in PJT II. We actively participate in promoting IWRM implementation in the Citarum River Basin. To support the activities, PJT II actively participates in several training sessions on IWRM as a contributor and participant as well. This participation goes back a couple of years, when I was still part of the PJT II staff. We still promote those kinds of activities now, even when I became president director of PJT II and vice chairperson of NARBO. To disseminate and spread IWRM implementation knowledge, I have also introduced this training to my staff as one of our capacity building programs. Understanding the benefits and improving our human resources is essential, not only individually but also institutionally. We managed to send some of our staff to join the training to share some of our experiences in our basin and our country with participants from other countries, and we could also learn from their experiences. We also promote the implementation of IWRM for NARBO, specifically in our basin and generally in Indonesia.

Last, I would say that water has become everybody’s business. Therefore, managing water resources in an integrated and holistic way is inevitable. We also would like to deliver our highest appreciation to NARBO in promoting IWRM across Asia for the past 10 years. I hope we can continuously improve IWRM implementation for our future generations.

Knowledge Products

NARBO has published or has been actively involved in developing knowledge products based on the result of its activities. These publications are being used at NARBO events and disseminated at international conferences. The following table shows notable knowledge products on IWRM implementation to which NARBO has contributed and they can be obtained on the NARBO website:

Publication Title	Contributor(s)	Publication Year	Outline
Sustainable Management for Water Resources Infrastructure	NARBO	2008	Outcome of a series of thematic workshop on sustainable management for water resources infrastructure
Water Rights and Water Allocation: Issues and Challenges for Asia	ADB	2009	Practical advice on the concepts and terminology surrounding water rights and water allocation
Water-Related Disaster and its Management in Asian Countries	NARBO	2009	Outcome of a series of thematic workshop on water-related disaster and its management in Asian countries
IWRM Guidelines at River Basin Level	UNESCO	2009	Guidelines for practitioners of IWRM
Leadership in Preparing River Basins for Future	NARBO	2012	Summary of NARBO retreat
Corporatizing River Basin Organizations	NARBO	2012	Summary of RBO seminar
Water Wealth? Investing in Basin Management Asia and the Pacific	IUCN, ADB, and NARBO	2013	Assistance for ministers of finance and decision makers on country investment on river basin
NARBO Activity Report	NARBO	2013	Summary of NARBO activities in 2010–2012
NARBO Short Report No. 1	NARBO	2013	Introduction of IWRM in Mahaweli River Basin
Functional Frameworks for River Basin Governance	CRBOM	2014	Introduction of RBO types in Asia and typical RBOs with strengths and weaknesses

ADB = Asian Development Bank, CRBOM = Center for River Basin Organizations and Management, IUCN = International Union for Conservation of Nature, IWRM = integrated water resources management, NARBO = Network of Asian River Basin Organizations, RBO = river basin organization, UNESCO = United Nations Educational, Scientific and Cultural Organization.

UNESCO IWRM Guidelines

One of the most notable knowledge products of NARBO is the publication *IWRM Guidelines at River Basin Level*, which deals with the context that while IWRM principles were in general widely recognized and accepted, the progress of IWRM implementation in many river basins had not been satisfactory. The guidelines document was launched at the 5th World Water Forum in Istanbul, Turkey, in March 2009, to raise awareness and facilitate the practical implementation of IWRM in river basins. The United Nations Educational, Scientific and Cultural Organization (UNESCO), the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT), and JWA conducted this project, along with NARBO and ADB as collaborators.

NARBO was also actively involved in the formulation of the guidelines:

- They were presented at NARBO's third General Meeting and incorporated into the Action Plan 2008–2009.
- The chairperson and vice secretary-general of NARBO were members of the steering committee.
- The executive vice president of JWA took on the role of co-chair of the steering committee.
- JWA drafted the keys for success of water resources management, sharing Japan's case study and collecting more from other NARBO member countries. Disseminating these success stories is likely to lead to breakthroughs in dealing with potentially challenging situations or open the door to better IWRM. Since they have proved to work in practice, they function as good examples to apply to other river basins.
- Several steering committee meetings were held to produce the guidelines, with substantive contributions from NARBO.

Thematic Workshops

To identify issues and find practical solutions, NARBO has conducted thematic workshops as stipulated in the NARBO Action Program. Since 2004, 12 workshops have been conducted on the themes of water-related disaster and its management in Asian countries, sustainable management for water resources infrastructure, and water allocation and water rights (see Annex 3 for details). Participants developed action plans, which were subsequently shared within their organizations and some of them actually being incorporated into their RBO's basin plans as a result.

Performance Benchmarking

NARBO's performance benchmarking service provides a management tool to assist RBOs to (i) assess performance in core operational areas, (ii) enable peer learning on performance improvement with other RBOs, (iii) improve efficiency and effectiveness of service delivery, and (iv) track progress toward better organizational performance. See Box 3 for details on the rationale behind performance benchmarking.

The service was launched at the 2nd Southeast Asia Water Forum in Bali, Indonesia in September 2005 after 12 months of participatory design, followed by initial implementation in selected basins in the region: Jasa Tirta II in Indonesia (October 2006), Mahaweli Authority of Sri Lanka (December 2006), Laguna Lake Development Authority in the Philippines (January 2007), and Red River Basin Organization in Viet Nam (May 2007).

Following successful pilot testing and initial implementation, performance benchmarking was done on Citarum Balai Besar in February 2008. From 2009 onward, Indonesia subsequently established a national RBO benchmarking program for Balai Besar Wilayah Sungai (BBWS) Mesuji-Sekampung, Balai Pengelolaan Sumber Daya Air Way Sekampung-Way Seputih, BBWS Cidanau-Ciujung-Cidurian, Balai Pengelolaan Sumber Daya Air Cidanau-Ciujung, BBWS Brantas (East Java), and Jasa Tirta I (PJT I-Brantas).

The NARBO management team meeting, held in Sri Lanka in November 2012, reviewed the RBO performance benchmarking program and encouraged the NARBO Secretariat to support more member organizations to join the subsequent implementation round. In response to CRBOM's call, three RBOs embarked on the performance benchmarking in 2013–2014: HELP Davao Network in the Philippines, Mun River Basin Committee in Thailand, and Selangor Water Management Authority (SWMA) in Malaysia.

The service is ongoing in Indonesia, with support from the Directorate of Water Resources Management and CRBOM. In 2006–2013, the RBO performance benchmarking process was applied in 34 RBOs in Indonesia. The keys for success of the RBO performance

Box 3: Rationale behind Performance Benchmarking

River basin organizations (RBOs) play a vital leading and facilitating role in implementing the integrated water resources management (IWRM) approach to address the water management challenges.

To fulfill this strategic role, RBOs need to continuously improve their performance and to effectively and efficiently deliver their expanding mandate and functions for IWRM in river basins. In this context, performance benchmarking should be applied as a core management strategy for improving performance. NARBO in 2004 developed the performance benchmarking service for RBOs, which includes a peer review process. The Asian Development Bank and the International Water Management Institute, through a series of benchmarking activities, in collaboration with NARBO member organizations, initiated the service.

The benchmarking process uses the balance scorecard method to assess the organization, including a self-assessment moderated by peer reviewers. The benchmarking system includes 14 performance indicators that reflect common processes in core business areas considered essential for effective basin management within the IWRM framework. Benchmarking is implemented in four stages:

- (i) self-assessment of RBO's present performance,
- (ii) setting targets for future performance in each business area,
- (iii) formulation of plans to reach the targets, and
- (iv) peer review and assessment of plans for organizational improvement.

Stages (i)–(iii) are designed as an internal evaluation and learning process, managed by a senior member of the RBO. NARBO may provide an independent facilitator to assist and initiate the process. Stage (iv), the peer review meetings and discussions, is the key to effective use of the benchmarking program. It involves sharing and advice from external partners as well as comparison of performance. NARBO peer reviewers are experienced RBO managers skilled in assessing how representative the self-assessment is and how realistic the improvement target and plans are. They also work with the RBO management to establish commonly agreed performance goals and change management proposals. The peer review process is designed to facilitate RBO planning and implementation of improvements. It provides an opportunity to have policy dialogue; build capacity; exchange experiences, good practices, and information among similar organizations; and create synergy within the sector.

benchmarking implementation in Indonesia are (i) legalization through national regulation, (ii) national budget allocation, (iii) support from stakeholders and knowledge partners, (iv) spirit to achieve IWRM, and (v) presence of champions.

Certified peer reviewers are needed for the peer review process. There are two kinds of peer reviewer certification—international and national. Since 2010, the Indonesian National Peer Reviewer Training and Certification has been conducted every fiscal year, financed from the national budget and organized by the Directorate of Water Resources Management in collaboration with CRBOM. In December 2013, CRBOM conducted the Sri Lanka National Peer Reviewer Training and Certification in Colombo. See Box 4 for an account of the context surrounding the establishment of CRBOM.

Online Training Course

Following NARBO's basin study visit to Madrid and Zaragoza in Spain in May 2010, which linked Spain's river basin expertise with NARBO members and ADB's project clients in Asia, the network initiated two online diploma courses on river basin management and environmental management. CEDDET Foundation (Spain) designed and implemented

Box 4: Establishment of Center for River Basin Organizations and Management

Indonesia has over 5,590 rivers, grouped into 131 river basin territories. Several types of river basin organizations (RBOs) oversee these rivers: 2 corporate-type RBOs, Jasa Tirta I and Jasa Tirta II; 33 public utility-type RBOs under the central government jurisdiction; 57 public utility-type RBOs under provincial jurisdiction; 14 public utility-type RBOs under regency or city authority; and participatory water councils. The Government of Indonesia has strongly committed to developing a knowledge base networking system among the RBOs. In support of this, the Japan Water Agency has assisted through the NARBO twinning scheme in the establishment of the Dissemination Unit for Water Resources Management and Technology (DUWRMT), a project of the Japan International Cooperation Agency (JICA), aiming to develop the capacity of Indonesian RBOs and support other RBOs in the region.

The Center for River Basin Organizations and Management (CRBOM) was established under the jurisdiction of Ministry of Public Works in 2009. It has become a Regional Water Knowledge Hub for River Basin Organizations and Management, as part of the Asia-Pacific Water Forum's family of internationally recognized centers of excellence committed to generating and sharing water knowledge and building capacity in Asia and the Pacific. The center provides services in capacity development of water resources management and exchange of knowledge in the field of organization development for all stakeholders in Indonesia and the region. In this context, NARBO provided Indonesia with significant support for the establishment and the subsequent growth of CRBOM and CRBOM in turn joined the NARBO Secretariat to support NARBO activities.

the program in collaboration with NARBO, Ebro River Water Authority (Spain), JWA, and other knowledge partners in Asia and Europe. The courses take a proactive approach and promote exchange of experiences among participating water professionals from a practical viewpoint. Each course was offered online twice between October 2013 and April 2014.

The following are the main statistics of the online training courses:

- (i) Places available: 140
- (ii) Admission rate: 53%
- (iii) Participants: 88 RBOs from 17 countries (62% government agencies, 21% civil society, 9% academia, 6% private sector, 2% international organizations)
- (iv) Average age: 36 years
- (v) Gender ratio: 69% male, 31% female
- (vi) Success rate: 82% (16 certificates issued)

Twinning Program

As stated in the NARBO Charter, the twinning program underpins the promotion of sharing of information and understanding between full members. Several memorandums of understanding (MOUs) have been signed between members to facilitate the twinning program, and numerous staff twinning activities have taken place (see Annex 4 for details).

Specifically, staff of NARBO members learn and discuss current and future IWRM situations including surveys, plans, designs, construction and O&M of water resources infrastructure, etc., with partner members to explore the problems and more appropriate solutions for them (examples of twinning program agendas are shown in Annex 5). This twinning program also contributes toward the improvement of Asian IWRM through staff exchanges and annual meetings, i.e. information sharing that both parties facilitate. This further opens the door toward international collaboration for river basins in the region.

Voices from Twinning Program Participants

Why Is the Twinning Program Recommended?

Susumu Fujioka, Japan Water Agency (JWA)

“A series of twinning programs, which is a staff exchange program encouraged among NARBO member organizations, was conducted during NARBO’s first decade.

As one of the participants, I would like to highlight several reasons why the twinning program is invaluable:

- (i) The program has special benefits, which are not offered by regular training courses, such as the fact that the agenda is tailor-made to focus on the specific learning needs of the young officer. Thus, a better understanding of water resources management in the river basin emerges from both the catered classroom lectures and on-site field visits. In return, the experience of designing the program is also beneficial as it is comprehensive and cross-sectoral and involves all levels of river basin management, from end-user to the operational and decision-making level of water resources management. It encourages the designer and participants of the twinning program to cultivate a comprehensive view on the operation of river basin management.
- (ii) For the experienced officers, the twinning program is beneficial to share the basin challenges and experiences in the operation of river basin management. The exchange of views cultivates and stimulates their thinking, which leads to practical solutions at the operational level.
- (iii) Since the program is planned and executed directly by the river basin organizations (RBOs), the program content is very flexible and relevant at the operational level. It is recommended that the specific themes (water allocation in practice, decision making on water discharge, stakeholder meetings, asset management, public-private partnership, and so on) be discussed ahead of designing the twinning program to pinpoint subjects of interest.”

Formulation of Project for Capacity Development of River Basin Organizations

Masahiro Sugiura and Takeyoshi Sadahiro, JWA

“A twinning program between Perum Jasa Tirta (PJT) I and PJT II in Indonesia and JWA was conducted from April to June 2005, which was the first twinning program organized by NARBO. Three staff members from Indonesia and two from JWA were dispatched respectively for 2–3 months to identify the present state and issues of water resources management in the counterpart country as well as learn how to counter them. In Indonesia, the Law on Water Resources was enforced in 2004 and the government planned to establish national RBOs in around 30 important river basins. The dispatched staff from Indonesia realized the importance of developing capacity of RBOs using Japan’s knowledge and experiences, so they drafted a request to the Japan International Cooperation Agency (JICA) supervised by the Indonesian government.

In 2006, the Government of Indonesia submitted a request for a JICA project to the Government of Japan. The project was finally approved and started in 2008.

The project, Capacity Development for RBOs on Practical Water Resources Management and Technology, supported the establishment of the Dissemination Unit of Water Resources Management and Technology (DUWRMT), with training modules (guidelines for water resources management) and a counseling scheme of RBOs.

This is a good example of a successful twinning program. Phase 1 of the JICA project has been concluded and Phase 2 started in January 2015.”

Footprint in Asia and Beyond

World Water Forum

The World Water Forum is one of the biggest water-related events in the world. NARBO has participated regularly in every event since 2003 to publicize its activities.

3rd World Water Forum, Japan (2003)

At the forum held in March across Kyoto, Osaka, and Shiga, participants strongly recognized the importance of creating a partnership to promote IWRM in river basins in Asian countries. ADB, ADBI, and JWA signed a letter of intent to establish NARBO within 1 year. In February 2004, NARBO was formally established at the first General Meeting in Indonesia.

4th World Water Forum, Mexico (2006)

In pursuit of implementing IWRM in Asia through NARBO, the chairperson of NARBO introduced some activities in Mexico. In addition, the NARBO Secretariat set up a booth in the Water Expo. In one of the sessions, the chairperson featured the “NARBO Forest” with participants of the second General Meeting held in February 2006 in Indonesia. Through this event, NARBO expressed its commitment to continue implementing IWRM in river basins in Asia.

5th World Water Forum, Turkey (2009)

The UNESCO IWRM Guidelines, which included NARBO’s IWRM spiral model, were launched successfully at the forum in Istanbul, with the Crown Prince of Japan attending the ceremony. Since then, NARBO has been using the guidelines at IWRM training courses and disseminating them at various international conferences. The IWRM spiral is now well known among member organizations.

6th World Water Forum, France (2012)

NARBO members actively participated in the forum in Marseille. The NARBO chairperson served as chair for the session, Strengthen River Basin Organizations in the Asia-Pacific to Accelerate IWRM, and a representative from the Mahaweli Authority of Sri Lanka (MASL) gave a presentation titled “IWRM Solutions with Spiral Model: Experience from NARBO and Mahaweli Authority of Sri Lanka.” The NARBO Steering Committee members introduced the network and its activities in the Water Policy session. NARBO promoted the IWRM spiral as a partner organization of UNESCO, and JWA set up a NARBO booth at the Japan Pavilion. As part of the NARBO Secretariat, JWA displayed presentation materials about NARBO and distributed the latest NARBO leaflets.

Preparation for the 7th World Water Forum, Republic of Korea (2015)

NARBO is a lead organization in IWRM in Asia and the Pacific, alongside the United Nations Economic and Social Commission for Asia and the Pacific, Global Water Partnership (GWP), and UNESCO. The NARBO Secretariat has initiated preparation work to summarize the state of progress, case studies, and challenges of IWRM in the region. The report will showcase concrete results of NARBO's achievement to the international community.

Asia-Pacific Water Summit**1st Asia-Pacific Water Summit, Japan (2007)**

The NARBO Symposium on Catalyzing IWRM Investment in the Asia-Pacific Region was held on 1 December 2007 in Beppu City, Oita Prefecture, Japan. Attended by an audience of 100 people from 11 countries, the symposium was organized by the NARBO Secretariat in collaboration with the Ministry of Land, Infrastructure, Transport and Tourism of Japan and the Infrastructure Development Institute of Japan.

A recommendation document on the future direction of NARBO activities was adopted on the basis of discussions at the symposium which was also distributed among the high-level attendees of the summit. The event provided good publicity for NARBO's existence and activities and its appeal for the importance of IWRM, especially the need to prepare countermeasures for water-induced disasters.

2nd Asia-Pacific Water Summit, Thailand (2013)

NARBO organized its fifth General Meeting and study visit and technical workshops to coincide with the summit in Chiang Mai. It also organized several workshops related to IWRM, and ADB and JWA also organized the technical assistance completion workshop to discuss and share good practices on water governance in the region. Over 100 participants attended the meeting and workshops, sharing useful knowledge and experiences. On 18 May, NARBO welcomed four new member organizations from the People's Republic of China, Myanmar, Pakistan, and Thailand. After completion of the General Meeting, NARBO significantly contributed to the success of the 2nd Asia-Pacific Water Summit as one of the key IWRM networks in Asia. The results of NARBO's events were fruitful not only for its members but also for all water-related practitioners and policy makers who attended the summit.

Southeast Asia Water Forum**1st Southeast Asia Water Forum, Thailand (2003)**

A preparatory meeting for NARBO's launch was organized in Chiang Mai by ADB, ADBI, and JWA as a side meeting of the forum. This meeting led to the launch of NARBO in February 2004.

2nd Southeast Asia Water Forum, Indonesia (2004)

The keynote speech for the RBO session of the forum was given by the NARBO chairperson. Speakers gave presentations on their experiences and shared information of their RBOs and panelists discussed the essential points needed for capacity development of RBOs. The outcome document, *Developing Capacity of River Basin Organizations for Better Water Management in Asia*, was adopted at the session, with more than 100 participants

in attendance. At a NARBO side event, members exchanged information after the chairperson's presentation entitled "Water Rights and Duties for Rational Water Use."

3rd Southeast Asia Water Forum, Malaysia (2007)

At the forum held on 22–26 October in Kuala Lumpur, the vice chairperson of NARBO chaired the session Water Resources and River Basin Management Issues and gave a presentation titled "Present State and Future Prospects of NARBO." Two staff members of the NARBO Secretariat also gave presentations. One of the proposals made by NARBO was included in the final recommendations of the forum under the heading "NARBO to propose Asian IWRM procedures."

United Nations Special Thematic Session on Water and Disasters (2013)

The Special Thematic Session on Water and Disasters, an initiative of the secretary-general of the United Nations, was held on 6 March in New York, United States, to raise awareness, share experiences and good practices, and discuss ways forward toward global actions on water and disasters. The Crown Prince of Japan, the Crown Prince of the Netherlands, and the secretary-general of the United Nations joined the session, at which intensive and valuable discussions were conducted. Prior to the special event on 5 March, a technical discussion on key topics on water and disasters was held and NARBO convened the session on Integrated Water Resources and Flood Management in the Context of International Water Resources Management and Water Cooperation. Organizing the side event and contributing to the special session raised the network's profile and value in the international community.

High-Level Experts and Leaders' Panel on Water and Disasters (since 2013)

The High-Level Experts and Leaders' Panel on Water and Disasters (HELP) was established in June 2013 as a spin-off organization of the United Nations Secretary-General's Advisory Board on Water and Sanitation. The main purpose of HELP is to assist the United Nations, governments, and stakeholders in mobilizing political will and resources, and in galvanizing actions to raise awareness, ensure coordination and collaboration, establish common goals and targets, monitor progress, and take effective measures relative to water and disasters. Members of HELP are ministers in charge of disaster management and experts in international organizations. NARBO is a founding member of HELP and has been contributing to the discussions by offering the experiences of the network as one of the voices from Asia. NARBO contributed a paper to the Special Edition of Water Policy focusing on water and disaster, which will be launched by HELP at the 7th World Water Forum in 2015.

OECD Water Governance Initiative (since 2013)

The Organization for Economic Co-operation and Development (OECD) Water Governance Initiative is an international multistakeholder network of public, private, and not-for-profit stakeholders, which was launched on 27 March 2013 by the OECD secretary-general. The initiative gathers twice a year in a policy forum to share ongoing reforms, projects, lessons, and good practices in support of better governance in the water sector. The Water Governance Index will be launched as a summary at the 7th World Water Forum. NARBO's chairperson is one of the members of the initiative, and NARBO has been

contributing to the discussion and development of the index by offering its experience as a network of practitioners at the field level, especially the RBO performance benchmarking system. NARBO is one of only a few practitioners participating in the initiative, hence posing greater expectations on the network's role within it.

Voice from Core Member on NARBO's Achievements

Keizrul Bin Abdullah: Chairperson of NARBO

“At the initial stage, building capacity to understand integrated water resources management (IWRM) within the context of river basins and the need for greater awareness were the first priorities of NARBO. In addition, the Asian Development Bank, Asian Development Bank Institute, and Japan Water Agency were needed to lead the effort of creating the structure of NARBO such as building up the membership, governance structure of NARBO, and technical matters to manage NARBO.

The next step was how to adapt it to the river basin level. At the fourth General Meeting in Makassar, Indonesia in 2010, we invited the staff of the Ministry of Planning and Finance of Indonesia and asked them what they were looking for in IWRM in terms of next steps. At the river basin organization (RBO) seminar in June 2011, we decided that NARBO needed to focus more on water governance as a second step and that more external people should be involved in NARBO through water governance.

NARBO's RBO performance benchmarking is directly contributing to developing the indicators of the Water Governance Index, so NARBO will serve as a leader and guide in this effort.

NARBO also contributed to raising the visibility of the Japan Water Agency and the capacity development of its staff and organization.”

Seamless Support for NARBO

From the Asian Development Bank

Water Sector Operations

Water Operational Plan (2011–2020)

ADB's Water Operational Plan 2011–2020 guides ADB operations in the water sector to improve the effectiveness and enhance the quality of the outcomes. It sets specific targets for strengthening capacities of RBOs to implement IWRM and encourages project designs to embed the IWRM process in river basins and in urban and rural areas within basins.

Water Financing Program (2006–2010, 2011–2020)

Following the 3rd World Water Forum in 2003, ADB responded to the calls for doubling water investment by formulating its Water Financing Program, which was formally announced in March 2006. Building on the work of ADB's Water for All policy, it sought to increase investments over 2006–2010 to respond more effectively to the region's critical water investment needs.

The program pipeline includes programmed water investments, a wide array of knowledge and awareness products, and services to support regional cooperation. It focuses on combining increased investments in water infrastructure with capacity building and reforms in three key areas: (i) rural water services to improve health and livelihoods in rural communities, (ii) urban water services to support sustained economic growth in cities, and (iii) basin water management to promote IWRM and healthy rivers. ADB provided total program financing of \$11.44 billion.

The subsequent Water Financing Program for 2011–2020 pursues investment in a range of \$2.0 billion–\$2.5 billion annually, 25% of which is contributed to basin water works.

Recent Loan Projects

ADB needs to expand its basin water operations with long-term IWRM investment programs in river basins that include infrastructure, management reforms, and capacity development. An increasing number of ADB-financed projects are now undertaken with specific recognition of water resources management and river basin planning. Knowledge and capacity building in IWRM and developing road maps for river basin improvements are also included, for example, in the Citarum River Basin in Indonesia, the Bagmati River Basin in Nepal, and, more recently, the first IWRM loan in Karnataka in India.

Technical Assistance to Support NARBO

Promoting Effective Water Management Policies and Practices

Amount: \$4.0 million (Phase 1, May 2002–Oct 2005), \$1.0 million (Phase 2, Feb 2003–Jul 2004), \$4.3 million (Phase 3, Dec 2003–Dec 2006), \$5.6 million (Phase 4, Jan 2005–Apr 2008), and \$6.2 million (Phase 5, Jul 2006–Dec 2009)

Source of Funding: Cooperation Fund for the Water Sector (The Netherlands and Norway); for Phase 5, also Technical Assistance Special Fund

The technical assistance project supported the ADB-organized sessions at the 3rd World Water Forum and the initiation of follow-up activities in ADB-financed water sector operations aimed to accelerate progress in achieving the Millennium Development Goals and targets related to water and poverty reduction. Under the category of water partnerships, several partnerships, including NARBO, were developed to catalyze the implementation of ADB's water policy and help build capacity in IWRM. Other supported national and regional water partnerships dealing with different water-related issues are the Southeast Asia Water Utilities Network, Water for the Poor–Partnerships for Action, Gender in Water Partnership, National Water Sector Apex Bodies, Asia-Pacific Water Forum, Mayors' Asia-Pacific Environmental Summit, and South Pacific Applied Geoscience Commission, among others.

Process Development for Preparing and Implementing Integrated Water Resources Management Plans

Amount: \$1.0 million (May 2007–Jul 2009)

Source of Funding: Government of the Netherlands

Following the 2002 World Summit for Sustainable Development in Johannesburg, the regional technical assistance project was proposed to help the governments develop and implement IWRM strategies. It aimed to strengthen the framework for improved IWRM planning and implementation at the national and local levels, more specifically to develop and implement IWRM strategies in Bangladesh, Indonesia, Pakistan, and Viet Nam.

In Indonesia, the government developed a performance benchmarking and peer review service for RBOs based on NARBO's methodology and applied it to six such organizations.

Managing Water in Asia's River Basins: Charting Progress and Facilitating Investment

Amount: \$2.07 million (Jun 2008–Dec 2014)

Source of Funding: Japan Special Fund, Spanish Cooperation Fund

The technical assistance project aimed to encourage further basin water investments under ADB's Water Financing Program (2006–2020) and demonstrate good practices in introducing IWRM in river basins. It contributed to the targeted outcome of the second phase of the Water Financing Program—the introduction of IWRM in 30 river basins across the region.

The RBO performance improvement component of this project supported a range of capacity building activities of 25 RBOs in the region, in collaboration with NARBO and other partners, including NARBO's IWRM training program, general meetings, study visit to Spain, online training certificate courses, performance benchmarking service, and strengthening of CRBOM.

Supporting Investments in Water Security in River Basins

Amount: \$2.0 million (Nov 2010–Mar 2014)

Source of Funding: Japan Special Fund

Based on the cooperation in NARBO, ADB and JWA on 9 February 2009 signed a letter of intent for further collaboration to improve water security in the region and enhance IWRM. It targets in particular investment planning and capacity development of RBOs in Indonesia, Nepal, and Uzbekistan.

NARBO's Contributions to ADB Operations

NARBO's Achievement: ADB acknowledges that the increasing awareness of IWRM within the region can be attributed to the efforts of NARBO over the past decade. NARBO's goal of promoting and implementing IWRM in Asia is achieving sound and steady progress, and NARBO is in a good position to further extend its influence by broadening its support within the region.

Role of NARBO: About 75% of NARBO member organizations are also ADB clients and partners from developing member countries. ADB recognizes that NARBO provides a suitable platform for catalyzing dialogue and support for river basin management, specifically to deliver additional basin water investments, introduce IWRM to river basins, expand basin water operations, and introduce and embed IWRM.

Support for Basin Investments: There is increasing interest within the region to adopt the IWRM approach for river basin management. To support more long-term and integrated planning of water resources, developing member countries are interested in seeing the approach adopted, particularly in those regions where water scarcity and competing demands for water are increasing, e.g., the People's Republic of China and India.

Mutual Learning on Good Basin Practices among River Basins: The number of ADB water projects that involve capacity building of existing or new RBOs for IWRM is increasing. Mutual learning between RBOs on good basin practices as well as solutions and strategies to tackle basin challenges in the region through NARBO will add value to ADB's basin water operations.

Business of Change: NARBO is about changing people and institutions to consider water resources management in a more integrated way. ADB acknowledges that NARBO can contribute to a better future for water management in Asia and the Pacific by promoting and catalyzing good examples of how water security can be improved. While there remain challenges, countries like Indonesia are taking the lead in institutionalizing the process for others to follow.

From the Asian Development Bank Institute

Capacity Building and Training

ADBI's vision is to consolidate its position as the leading knowledge center for economic development in Asia and the Pacific, known for its excellence, originality, and professionalism. It aims to provide intellectual input for policy makers in ADB's developing member countries. ADBI will achieve this vision by conducting research with a focus on medium- to long-term development issues of strategic importance that will affect the region, and through capacity building and training (CBT) activities that contribute to ADB's overarching objective of poverty reduction.

The purpose of ADBI's CBT programs is to help promote effective development planning and management by mid- and senior-level officials in ADB's developing member countries. CBT activities are classified into three formats: policy dialogue, course-based training, and e-learning. These formats support the achievement of ADB and ADBI's overarching goals by developing the capacity of government officials in developing member countries through knowledge and learning activities. ADBI's activities are aligned with ADB's strategic focus, which includes poverty reduction and inclusive economic growth, the environment, regional cooperation and integration, infrastructure development, middle-income countries, and private sector development and operations.

Collaboration on NARBO Activities

ADBI signed the Letter of Intent for Collaboration on NARBO with ADB and the Water Resources Development Public Corporation of Japan (WARDEC, the predecessor of JWA) in 2003. The agreement laid out ADBI's engagement in the development of research, capacity building, training, and networking of the water sector. As is widely known, water is necessary not only for human survival and well-being, but also for economic growth in Asia. Since water resources are limited and climate change has affected our daily lives, proper management of water resources will be essential to ensure economic growth in every country. In this regard, capacity development is one important measure.

Based on this policy and background, ADBI has contributed to NARBO activities enhancing the knowledge of practitioners and senior officials by conducting training and networking since 2004. To raise the effectiveness of its training, workshops, and information sharing activities, ADBI has collaborated closely with ADB and JWA. In addition, ADBI took the initiative to conduct workshops and training specifically aimed at strengthening capacity.

Contributions to NARBO Activities

Thematic Workshops on Water Allocation and Water Rights (2005–2007)

One of NARBO's objectives is to disseminate practical information and experience on water resources management. According to past surveys carried out by the NARBO Secretariat, member organizations consider water allocation and water rights to be of great value to them. Based on this result, ADBI organized workshops with the aim of offering proposed solutions to problems regarding water allocation and water rights.

For the training to be effective, ADBI determined the following set of actions:

- (i) sharing information on the current status of participating countries,
- (ii) clarifying the problems in participating countries, and
- (iii) tackling approaches for improvement in cooperation with participants.

In each session, participants held rigorous discussions on key issues and deliberated how to approach them.

The following is an outline of the thematic workshops:

No.	Date	No. of Participants	Venue	Action Items
1	5–9 Dec 2005	24 participants from 6 countries (Indonesia, Japan, Lao PDR, Philippines, Thailand, and Viet Nam)	Ha Noi, Viet Nam	Presentation and discussion on current issues of water allocation and water rights
2	5–9 Jun 2006	26 participants from 7 countries (Indonesia, Japan, Lao PDR, Philippines, Sri Lanka, Thailand, and Viet Nam)	Metro Manila, Philippines	Presentation based on lectures
3	27 Nov–1 Dec 2006	35 participants from 7 countries (Indonesia, Japan, Lao PDR, Philippines, Sri Lanka, Thailand, and Viet Nam)	Bangkok, Thailand	<ul style="list-style-type: none"> • Review of the first and second thematic workshops • Proposals for approach to improve water allocation issues
4	23–26 Jan 2007	13 participants from 7 countries (Indonesia, Japan, Lao PDR, Philippines, Sri Lanka, Thailand, and Viet Nam)	Saitama, Japan	Presentation on drafted action programs for approach to improve water allocation issues

River Basin Study Visit (2012)

The River Basin Study Visit was held on 24–28 May 2010 in Madrid and Zaragoza, Spain, led by ADBI. Around 20 senior officials from NARBO member organizations and water-related organizations in Asia participated in this study visit.

The training objectives were as follows:

- (i) exchanging experiences and case studies on integrated water resources management (IWRM) in Asian and European countries,
- (ii) exploring ways to improve water security in Asia, and
- (iii) strengthening networking among participants, speakers, and partner organizations.

Participants took particular note of the importance of the legal framework, transparency, and the necessity of state-of-the-art technology for water resources management through exchanges of opinion and lectures by the host organization and the Government of Spain.

From the Japan Water Agency

JWA has been engaged in water resources development and management in Japan for over 50 years since its establishment in 1962. To share these experiences with Asian developing countries, JWA, with ADB and ADBI, launched NARBO in February 2004. JWA has been continuing to work as part of the NARBO Secretariat, consistently leading the activities of the network.

Legal and Institutional Scheme

The vision of JWA is “to provide a stable supply of safe, quality water at a reasonable price.” The agency’s work is based on the Basic Plan for Water Resources Development for each of the seven river systems (Ara, Chikugo, Kiso, Tone, Toyo, Yodo, and Yoshino) designated and to conduct water resources development and river basin management. JWA carries out a wide variety of activities, ranging from securing water for domestic, industrial, and agricultural use to controlling floods and maintaining the normal function of the river water.

As a public entity with responsibility as the RBO in Japan, JWA’s objective in supporting NARBO activities differs from other donor organizations in that it aims not only to share its own experiences and knowledge internationally but also to improve its own water resources management capability as an RBO.

Mutual Learning on Good Basin Practices

JWA strives to continuously improve itself by applying the experiences and successes in other Asian countries through NARBO to develop the capacity of its own staff and organization.

In the Intermediate Implementation Plan (Medium-Term Plan), which was approved by the relevant government ministry, JWA’s plan for promoting international cooperation is prescribed as follows: (i) continue to offer technical information and accumulated knowledge to developing country institutions responsible for water resources development through staff dispatch and exchanges; (ii) offer advice to those who want to establish RBOs and help NARBO members with capacity building; and (iii) take advantage of its disaster-response skills in its international cooperation activities, including extending assistance for water-related disasters and during the reconstruction phase.

Support Structure for NARBO

As the main implementation arm of NARBO, JWA functions as the head office of the NARBO Secretariat in its headquarters. The vice secretary-general and three or four of the staff are engaged in substantial and logistics work for NARBO, such as website maintenance, newsletter production, and member coordination. At major NARBO events, JWA assigns additional staff as reinforcement.

Program of Support

One expectation of an RBO may be to tackle IWRM challenges through adaptive and participatory approaches in water resources management, water-induced disaster management, and sound environment management. Possible support activities by JWA include the following:

- (i) to formulate or improve the legal and institutional scheme of an RBO and develop the basin management plan,
- (ii) to coordinate water distribution of water users,
- (iii) to improve the operation of facilities toward disaster mitigation and risk management,
- (iv) to secure safe and reliable daily operation of water facilities, and
- (v) to help formulate investment plans and capacity development plans.

Water governance may be considered as the tools necessary for the proper planning and management of water resources based on the IWRM spiral concept. The tool box consists of the following:

- Institutional tools: legal framework; multisector coordination mechanisms for planning, managing, and monitoring; skilled and trained human resources, etc.
- Water dialogue tools: recognizing the essential role and involvement of civil society and the private sector, awareness, transparency in sharing knowledge, etc.
- Decision and management tools: updated basin profile, hydrometeorology, environmental survey and assessment, specific studies, modeling and technical manuals, etc.
- Financial tools: ensuring the sustainability of the institutional, water dialogue, and decision tools, ensuring investment for more efficient water use and water-related risk management

Voice from a Core Member on NARBO's Achievements

Harianto: President director, Perum Jasa Tirta (PJT) I (Indonesia)

Thanks to NARBO's activities, IWRM has been fully implemented in PJT I. It has contributed to increased trust and reliance in PJT I from the Ministry of Public Works. NARBO's executive retreat, which was conducted in June 2011, was especially an opportunity to show to the minister of public works how PJT I implements integrated water resources management in the basin. As a consequence, the Ministry of Public Works has formally recognized the role of PJT I and added the management of three river basins to PJT I in 2014. This is a concrete and direct contribution of NARBO.

Voices from Members: The Difference Made So Far

On NARBO's Achievements

Mochammad Amron: Former chairperson of NARBO (2008–2010)

NARBO continues to sustainably contribute activities by sharing their own knowledge under what could be qualified as a “sharing rather than teaching” approach. Through benchmarking, each basin can assess their own performance level. The peer review contributes to their own analysis on what to improve in the future in terms of capability and technical matters. Another NARBO tool is the spiral model, which provides a very clear and useful guide to improve competencies to cope with evolving river basin challenges such as climate change based on past experiences.

Apichart Anukularmphai: Senior advisor and president, Thailand Water Resources Association

NARBO succeeded in networking within countries of the region, in disseminating knowledge on IWRM, in raising awareness, and in sharing experiences and knowledge on IWRM.

Tjoek Walujo Subijanto: Senior advisor of NARBO

NARBO has achieved notable and significant positioning among the international community.

Raymond Valiant: Director, PJT I, Indonesia

NARBO has given us a better understanding of networking—its benefits and advantages; a better understanding of the role of RBOs for river basin management and providing them with a better footing in performing their mandate as an RBO; and a better understanding of the principles of IWRM.

Md. Khairi Bin Selamat: Director, Selangor Water Management Authority (SWMA), Malaysia

The capacity building activities were very useful to SWMA staff, and the RBO performance benchmarking helped identify areas where SWMA can improve.

Anthony Sales: Director, Department of Science and Technology, Philippines

The RBO performance benchmarking which applied the balance score card was very useful for HELP Davao Network in terms of improving its performance and in developing its plans of action, and the training courses on IWRM were useful for building capacities for IWRM.

On How Membership in NARBO Has Improved Management of Asia's River Basins and on NARBO'S Benefits to RBOs

River Basin Organizations

Herman Idrus: President director, Perum Jasa Tirta II Public Corporation

PJT II has been sharing and getting experience in IWRM through NARBO. What we learned from NARBO directly and indirectly contributed to the development of PJT II and we have shared that knowledge with local governments. Based on the results of the benchmarking process, PJT II developed key performance indicators for measuring and setting clear targets for organizational performance such as finance indicators, customer satisfaction, and so on.

Don Clement Sudharma Elakanda: Additional director general, Mahaweli Authority of Sri Lanka

MASL has worked very closely with the NARBO Secretariat by organizing the IWRM training course four times and conducting a twinning program with JWA, which has contributed to knowledge sharing and capacity development of MASL staff. RBO performance benchmarking is a very important tool to measure where we are and where we should go. NARBO established a platform or network to communicate with RBOs in Asia and created an environment to develop concrete project proposals such as for dam safety and the climate resilience project by the World Bank.

Balai Besar Wilayah Sungai, Pompengam Jeneberang, Indonesia

The Indonesian Government issued Water Law No. 7 in 2004 which promotes IWRM and capacity building of Indonesian NARBO member organizations and RBOs. Based on this new law, Indonesian NARBO members formed four RBOs in accordance with existing river basin territories in South Sulawesi, namely Jeneberang, Walanae Cenranae, Sadang, and Pompengan Larona.

Brantas River Basin Organization, Ministry of Public Works, Indonesia

The Brantas River Basin Organization is currently building up a network of public participation experts to facilitate cooperation on a basin-wide level. It has also principally decided to proactively pursue public participation to avoid future conflicts with the relevant stakeholders on the implementation of the program of measures through the Coordination Team of Water Resources Management.

Bangladesh Water Development Board, Bangladesh

The Bangladesh Water Development Board has been trying to develop the country's water sector based on IWRM with structural measures (embankment, channel development, and pump houses, etc.) and nonstructural measures (hydrometeorological data collection, flood forecasting and warning services, capacity development of staff and community, etc.). The Bangladesh Water Act of 2013 has recently been introduced to legalize and institutionalize the use of water.

Ca, Cau, Day, Dong Nai, Vu Gia Thu Bon, Viet Nam

Some of our staff members have been able to gain knowledge about IWRM concepts and principles and utilize them for Viet Nam.

Laguna Lake Development Authority (LLDA), Philippines

The Philippine Clean Water Act of 2004 reform policies reinforced the enabling environment for IWRM implementation in the Laguna Lake Basin and shall designate areas within the jurisdiction of the LLDA as one management area under the administration of LLDA. LLDA has and can contribute more to Asian RBOs and the rest of the world as a center of excellence on implementation of the environmental user fee system. As a chartered government-owned and -controlled corporation, LLDA can raise revenues and retain the same for its own operation from revenue-raising sources such as processing and regulatory fees for clearances and permits, and reasonable fees from users and/or beneficiaries of the resources, e.g., water supply (raw water abstraction for domestic and other uses), aquaculture (fishpen or fishcage fees), etc.

Mekong River Commission, Southeast Asia

The establishment of the Nam Gnum River Basin Committee (NGRBC) in 2010 can be regarded as the turning point of the Lao People's Democratic Republic (Lao PDR) in applying IWRM principles and as one of the leading RBOs in the country. The government has decided to replicate the model of NGRBC in other national river basin committees nationwide. NARBO has been providing valuable assistance to the Lower Mekong Basin countries—Cambodia, the Lao PDR, Thailand, and Viet Nam—in the form of training to apply IWRM in their respective countries. As for the Lao PDR, it has participated in most of the NARBO training events since they were started in 2004 and actively exchanged its experiences with other participating RBOs at the training. Upon their return to their home country, the Lao PDR participants share good practices with local river organizations.

Perum Jasa Tirta I (PJT I), Indonesia

By Water Resources Law No. 7 of 2004 enforcement, coordination of water resources management must be established at the national level (National Water Resources Council), the provincial level (Water Resources Council or other name), and basin level (Water Resources Management Coordination Team or WRMCT). Thus, WRMCTs have been established both in the Brantas and Bengawan Solo whose memberships consist of RBOs, provincial and regency or municipal government agencies, and nongovernment organizations (water users, associations of irrigators, bulk-water users for domestic and industrial purposes, tourism, forestry pressure groups, etc.). As a result of this coordination, a specific reservoir operation pattern for the Brantas River Basin has been prepared by Jasa Tirta I Public Corporation and agreed by all stakeholders. Implementation of this pattern will be carried out by the corporation (which is responsible for maintaining the reservoirs), related irrigation agencies, and other main stakeholders.

Red River Basin Organization, Viet Nam

Water resources planning now takes a holistic approach involving all stakeholders and considering the river basin. Further, decision making on river basin management is supported by more information and consultation. IWRM concepts and tools have been introduced and applied in water resources and river basin planning.

Government

Arie Setiadi Moenwanto: Director, Directorate General of Water Resources, Indonesia

Our Water Resources Law of 2004 was an important milestone to change the approach to IWRM, and in 2007, 33 RBOs were established to change the paradigm from one of “construction project” to one of “water resources management.” We also established a national and provincial council of water resources for the river basin level to coordinate river basin management. They are composed of 50% government and 50% private institutions to take into account opinions and to work together to negotiate among all stakeholders.

In terms of what we gained, we learned from JWA and K-Water what the optimal RBO looks like. Through benchmarking, we check that the RBO is on the right track. For instance, 33 RBOs are public and have not yet started fundraising for operation and management. NARBO directly helped the achievement in water resources management in Indonesia by introducing the idea of RBOs, working together in the formulation of DUWRMT, changing the minds with regard to water resources management, and capacity building through learning from Japan’s experiences. And, we now cooperate with PJT I and PJT II and are gradually expanding their working area (like in the case of JWA) so that in the future they are regulator, developer, operator, user, and mediator.

Department of Irrigation and Drainage, Malaysia

NARBO has promoted IWRM on the basis of the spiral model and strengthened the capacity of RBOs in Malaysia.

Department of Water Resources, Thailand

The Department of Water Resources of Thailand has promoted IWRM and strengthened RBO capacity, including a wide range of stakeholder involvement in planning processes participated by local people and communities. The participatory planning process, which is a part of IWRM, has been widely adopted in the river basin committees’ annual works.

General Office for River Basin Organizations, Viet Nam

NARBO has supported training and shared knowledge with more than 300 Vietnamese water resources management professionals on the subject of IWRM. In this process, the General Office for River Basin Organizations has been able to develop bilateral cooperation with JWA and obtained various support, including for water resources planning, irrigation works management and operation, and dam safety management. JWA also assisted Viet Nam in promoting a project on wastewater treatment before discharge into the irrigation canal system. This project is still at the inception stage and the government is looking for project funding in the New Rural Development Program hoping to start implementation in 2015.

Natural Environment Commission (NEC), Bhutan

NEC enacted the Water Act of Bhutan 2011 which mandates the NEC and other relevant ministries to carry out a water resources inventory as well as national IWRM and river basin management plans in the 11th Five-Year Plan (2013–2018). The Water Resources Inventory was completed and data gathered will act as input for the development of the

National Integrated Water Resources Management Plan and River Basin Management Plan. Furthermore, NEC developed the Water Regulation for Bhutan in 2014. NARBO provided specific countries and NEC with training on the IWRM spiral model, following which NEC has finally become a RBO.

National Water Resources Board, Philippines

The Pampanga River Basin IWRM Plan was guided by the National IWRM Plan Framework formulated in 2007 with support from the United Nations Environment Programme. The IWRM spiral process was applied in this initiative. The capacity gained by staff in the training and workshops organized by NARBO and other donor agencies enhanced the institutional capacity toward operationalization of IWRM in the country. This is a result of a collaborative undertaking of different institutions, including the Global Water Partnership–Philippine Water Partnership.

Orissa* Water Planning Organization, India

The Baitarani Basin has been taken as a model basin in Odisha to encourage the basin water investments and to demonstrate good IWRM practices under ADB's Water Financing Program technical assistance. A draft IWRM road map has been prepared for implementation of IWRM in the Odisha State Government under the Odisha Integrated Irrigated Agriculture and Water Management Investment Programme (OIIAWMIP) financed by ADB.

Pakistan Meteorological Department, Pakistan

The RBO has been improved in terms of knowledge transferred to Pakistan from training, workshops, and presentations at meetings on IWRM in the last 10 years. The vulnerability of the RBO in Pakistan has been reduced by improving the river management system with the help of studies and exchange of knowledge from different countries.

Water and Energy Commission, Nepal

The National Water Plan which was prepared by the Water and Energy Commission Secretariat in 2005 adopted the principles of integration, coordination, decentralization, and extensive people participation for the development and management of water resources along with good governance, equitable distribution, and implementation within the framework of sustainable development. The National Water Plan has focused on the establishment of river basin or subbasin offices and organizations. Water resources should thus be managed following the principle and process of IWRM within the unit of the river basin or subbasin.

Regional Knowledge Partners

Global Water Partnership South Asia

GWP South Asia created the Asia Pacific Adaptation Network in 2011. The Water and Climate Resiliency Program is implemented by the GWP South Asia Regional Office in Sri Lanka, hosted by the International Water Management Institute and the six country water partnerships—Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka—from 2013 to 2015.

* In 2011, the Government of India approved the name change of the State of Orissa to Odisha. This document reflects this change. However, when reference is made to proper nouns that predate the name change, the formal name Orissa is retained.

GWP India contributed to the draft national water policy that was launched in 2013. IWRM and climate change are fully considered within the new water policy 2012, which has been approved by the Government of India.

The 2-day training workshop in 2013 by the Asia Pacific Adaptation Network showcased good practices from the region on water security progress, indigenous knowledge, and modern technology working toward resilience in the water sector. It also underlined the need for cooperation for climate resilience and laid emphasis on the framing of coherent policies and strategies in relation to IWRM in the region. The workshop strengthened the GWP SAS partnership with regional entities such as the South Asian Association for Regional Cooperation Disaster Management Center, South Asia Co-operative Environment Programme, and NARBO.

A number of training programs were held to develop the skills and knowledge of various professionals working in the water sector who are committed to imparting further training on IWRM. They gained extensive knowledge on IWRM, including the importance of this concept, pillars and principles of IWRM, tools and techniques, policy, strategy, procedures, projects, and action plans.

National Hydraulic Research Institute of Malaysia

The national water policy was first drafted in 2000. Following efforts and discussions with the main steering committees and various subcommittees and agencies, it was formulated and launched on 24 March 2012. It is recognized as the biggest achievement since it was considered in the late 1980s. Various main events have also been organized to promote and advocate IWRM principles in Malaysia in the past 10 years, such as the Conference on Legislation and Institutional Arrangements in IWRM and Training of Trainers on Legislation and Institutional Arrangements in IWRM in 2007.

Voice from the Secretariat

Tadashige Kawasaki: NARBO Secretariat, Japan Water Agency

“Actually, I’m very happy to have served NARBO as one of the secretariats since 2008. I’ve learnt many things through NARBO activities especially opportunities of communication. It made deepening my understanding to IWRM and helped to develop any useful activities of NARBO to increase the influence among water sector in the world.

The other day, my friends in an international organizations said ‘When it comes to IWRM in Asia, NARBO firstly comes to my mind.’ I was really glad to hear her comments and recognized how NARBO was well known among water sector in Asia. It is the result of the sincere contribution of member organizations and steering committee members.

Recently, I feel that expectation to NARBO among international is increasing when I joined the international conferences. I’m convinced that we’re on the right track to achieve our goals. On the other hands, we have challenges how to balance with expectations of international society and improvement of IWRM in Asia in a smart manner.

Our society is facing many issues, especially climate change and rapid urbanization, and we’re requested to tackle with these complex issues as a practitioner of IWRM at field. The NARBO Secretariat commits to address these changes by supporting NARBO members and think together for achieving our goals. I’m convinced that NARBO including secretariat will develop gradually by reflecting to the socioeconomic change as like ‘IWRM Spiral.’ To achieve it, new and smart methodology should be developed with support and contribution of all members of NARBO. I’ll try to make effort to be more approachable secretariat for members.”

The Way Forward: 360° Vision

NARBO is the only network of river basin management organizations for practitioners in Asia. Its membership comprises the men and women who actually manage Asia's dams, handle water flows, prepare the first lines of defense against floods and drought, and operate the valves that allocate water to farmlands, industry, and cities. Many of these practitioners across the region have already seen the value in adopting the IWRM approach, and, for them, IWRM proves indeed that competing demands between users can be managed for the optimal benefit of all.

Ten years after its launch, the time is ripe to take stock of NARBO's achievements, assess gaps and opportunities for the future, and strategically attune the region's IWRM mission to enhance Asia's critical water security for years to come (see Annex 6 for NARBO's 2014 Manila Declaration).

Summary of Activities

2004–2006: Creation of NARBO framework and promotion of understanding of IWRM at the river basin level

Members recognized the importance of promoting IWRM, as governments and public entities responsible for river basin management were searching for concrete means to enhance the legal and they could enhance the legal and institutional schemes for river basin management, and how to strengthen the capacity of RBOs to cope with basin issues using the IWRM approach.

At the onset, the priority was on awareness-raising and promotional activities (website, newsletter, annual report) for exchange of information and good practices on IWRM. This was followed by the implementation of the performance benchmarking service and twinning programs conducted through cooperation among members and the NARBO Secretariat.

2007–2010: Period for identification of issues and search for practical solutions

Based on its first 3 years of activities, NARBO further contributed to the promotion of IWRM in the region through further activities for sharing and exchange of information, IWRM training program, performance benchmarking, thematic workshops, twinning programs, and charting the progress of IWRM in Asia. With these activities, NARBO has set the quality standards in Asia for how RBOs should perform. During this period, ADB also executed its technical assistance to support water investments and road map advisory service for basin IWRM plans.

2010–Present: Increased focus on RBO capacity to improve water governance and expansion of the network to influence the global water sector

Between 2010 and 2013, ADB and JWA conducted technical assistance programs to improve water security in Nepal, Indonesia, and Uzbekistan based on NARBO's experiences. Further workshops (IWRM executive retreat, corporate seminars, etc.) were conducted to expand the network's influence to the global water sector. NARBO cemented its place as the lead organization on IWRM in Asia and will continue to promote IWRM in the global arena, taking the lead in World Water Forum sessions as well as participating in the OECD Water Governance Initiative and High-level Experts and Leaders' Panel on Water and Disasters (HELP).

Members' Suggestions for the Next Decade

River Basin Organizations

Brantas River Basin Organization, Indonesia

In the future, RBO activities should include discussions related to legislation, law, government regulations, and water acts in the various countries of Asia and the consequences of applying of these rules in practice. NARBO should organize activities to learn from other river basin management successes in other regions such as Africa, Australia, Europe, or North America. The best lesson on water trading that could be adopted for the future concerns the role of the water market in reallocating water to higher-value users. NARBO should select a demonstration basin area to promote the IWRM approach.

Bangladesh Water Development Board, Bangladesh

NARBO could evolve a comprehensive plan for the development, conservation, sharing, and utilization of water resources and contribute to enhancing cooperation according to the needs of the member countries and the principles of international law. It could also take the initiative to facilitate capacity development and knowledge networking for improving water security and sustaining economic development among the NARBO members.

Ca, Cau, Day, Dong Nai, Vu Gia Thu Bon, Viet Nam

The Vietnamese staff are so eager to learn from the knowledge and experiences of IWRM in other countries that NARBO should continue to help us connect with those advanced countries through long or short training and study tours.

Laguna Lake Development Authority (LLDA), Philippines

NARBO has to continue to explore and implement various means to sustain its financial capability and operation as well as its action plan, programs, and projects. NARBO members could do much to contribute to this goal, both in financial and nonfinancial terms. NARBO should continue and enhance its horizon as a global organization of Asian RBOs. This would also facilitate international support for its programs, in terms of experts and finances. LLDA can continue to share knowledge, experience, and lessons as a corporate public RBO. It can also provide stronger support to NARBO at all levels (steering committee, secretariat, program levels, etc.) and to other NARBO members.

Mahaweli Authority of Sri Lanka (MASL), Sri Lanka

The following are the suggestions of the Mahaweli Authority of Sri Lanka:

- consolidation of current activities to provide more benefits to developing member countries who want such assistance on a large scale,
- more innovative strategy to increase membership,
- reaching beyond the region to showcase Asia as a notable place to learn more about IWRM concepts,
- addition of new NARBO activities, and
- priority on understanding the impacts of climate change and adaptation measures.

Mekong River Commission, Southeast Asia

For the next 10 years, NARBO should keep up this momentum being the locomotive leading the NARBO members toward the destination where river basin development can bring about tangible benefits to people who are living along the rivers and are dependent on the water resources for their improved livelihoods. The next young generations can also enjoy the fruits of the sustainable development of the rivers. In order to broaden the areas of cooperation, the network should be extended to a larger number of RBOs around the world, in particular those with solid experiences in successfully applying IWRM principles and willing to share their experiences. NARBO should also increase its support to its members, especially the developing countries, to enable them to participate in more NARBO activities.

Perum Jasa Tirta I (PJT I), Indonesia

PJT I suggests that NARBO expand the performance benchmarking process, not only to a regional level but also on a global scale for comparison. It is expected that NARBO will conduct activities that act as a bridge for NARBO members to share experience and knowledge in water resources management, such as collaborative workshops, joint research, and staff exchange. PJT I will be able to get its many experts in IWRM involved with NARBO activities and is open to holding collaborative workshops or joint research.

Red River Basin Organization, Viet Nam

NARBO should provide its members with continued support to strengthen RBO capacities and sharing of field experiences on IWRM through training courses and field visits. NARBO could also facilitate contact and dialogue between upstream and downstream members, for example in the case of the People's Republic of China and Viet Nam.

Government**Department of Irrigation and Drainage, Malaysia**

NARBO should keep strengthening its expertise on how to improve capacity building within the network and effective ways to ensure RBOs promote IWRM or integrated river basin management in their country. The lessons learned over the last 10 years can serve as reminders or spur improvement in planning the NARBO direction in years to come.

Department of Water Resources, Thailand

NARBO could collaborate with other financing institutions, including ADB, to get resource persons or experts on different topics to inspire RBOs to perform more efficiently and effectively in their countries and to present and share their experiences with other RBOs. NARBO should find out from its members what the topics of interest are.

Natural Environment Commission (NEC), Bhutan

Most objectives and targets to achieve the IWRM goal are different from one country to another and it is difficult to fully understand from the country point of view. As such, sharing of success stories both from developed and developing countries would immensely benefit the other aspiring countries that are working toward the achievement of IWRM goals. NEC looks forward to having more seminars, training, and workshops on IWRM as well as sharing of information on other countries. Further, as Bhutan is embarking on developing the IWRM and RBO plans for the country, we look forward to NARBO's assistance in this particular field.

National Water Resources Board, Philippines

In order to fully achieve the objectives and goals of NARBO, we would like to suggest considering customized training on IWRM, water security, climate change adaptation, disaster risk reduction, and related topics in future activities. Moreover, due to funding constraints of the National Water Resource Board, we request funding support to attend future training organized by NARBO. We can share our experience on the formulation of the Pampanga River Basin IWRM Plan as well as regulation of water use based on the Water Code of the Philippines and other aspects.

Orissa Water Planning Organization, India

The following are suggestions for NARBO for the next 10 years regarding water resources management:

- program for imparting awareness to officers related to IWRM,
- capacity building on river health of the basin,
- total awareness program at the grassroots level among the stakeholders,
- a basin or subbasin to be taken up as model for complete implementation of IWRM,
- program for enhancing water use efficiency,
- guidance for preparation of benchmarking of projects,
- continued workshops and seminars to be conducted with the stakeholders,
- pollution-free river basins, and
- preservation of environmental ecosystem in the basin along with IWRM.

Pakistan Meteorological Department, Pakistan

It is suggested that close cooperation must be continued with member organizations to enhance the capacity building and effectiveness of RBOs.

Water and Energy Commission, Nepal

Continuation and improvement of present activities by evaluating the impacts of the activities of the past 10 years is vital.

Regional Knowledge Partners**Institute of Water Modeling, Bangladesh**

A NARBO training or workshop should be arranged in Bangladesh to explain the importance of forming RBOs to resolve many of its basin-related problems through concrete suggestions and presenting cases of successful RBOs to the decision makers and policy makers. Joint and collaborative research (low cost) can be designed and implemented.

National Hydraulic Research Institute of Malaysia

NARBO continues to spearhead activities for advocacy, raising awareness, exchange of information on IWRM good management practices, capacity building in RBOs, and network support among the member organizations in the region. With the involvement and support from ADB, more funding should be allocated and open for application among NARBO members to channel into research, development, and commercialization work in IWRM. NARBO will then act as the secretariat to manage the project(s) funded by NARBO and/or ADB. Furthermore, NARBO should develop an expert repository to gather all the RBO experts for an online discussion or forum that provides advice on related issues or problems encountered by any RBO, particularly related to the implementation of IWRM.

Thailand Water Resources Association

There should be initiatives to support IWRM practices in key pilot projects of NARBO members by providing technical advice and seed money to catalyze the process as well as to experiment with NARBO concepts. The Thailand Water Resources Association can provide training programs based on lessons learned in flood and drought management and specifically on redesign of infrastructure with respect to flood protection. It can also help in regional conferences and workshops by facilitating the overall organization of activities as well as design and coordination of technical sessions.

Lessons Learned and Recommendations

NARBO cannot be everything to everybody. As it sets its sights on the next decade, there are multiple achievements to celebrate, many lessons to be pondered, and, above all, much work yet to be accomplished. The overarching question driving the next 10 years is how to further push the boundaries for IWRM to benefit more river basins. Ultimately for NARBO members, improving water security in Asia and the Pacific—that is, the social, environmental, and economic well-being of our societies—remains the top priority.

Infusing the Spirit of IWRM

NARBO's foremost achievement has been to infuse the spirit of IWRM in managing water in river basins. Countries across the region are increasingly seeing the value of IWRM for the management of their river basins. However, the water security levels in the region are still very low, and climate change will make the task even more challenging. Furthermore,

sharing of water needs among stakeholders increases awareness and contributes to changing mind-sets.

IWRM is not a magic formula, but has proven to be an effective and crucial approach in enabling the proactive outlook of practitioners. If IWRM becomes too prescriptive and bureaucratic, it could even potentially become a barrier for RBOs. This can be averted by increasing and sharing knowledge and experiences on how best to use the approach effectively and judiciously.

Gaps

- To date, there has been no evaluation mechanism of NARBO itself as an institution and of its outputs; no indicators against which to measure its performance.
- While many new RBOs have been created in Asia in recent years, far too many river basins in the region do not yet have an established RBO structure.
- While the water community has debated issues of water security for years, there are still many decision makers who have yet to grasp the technical precepts of water resources management. This gap between the practitioners' knowledge and that of decision makers is not negligible and can halt the progress needed. The technical knowledge has not sufficiently translated into policies throughout the region.

Recommendations

- Develop a monitoring or benchmarking program for NARBO itself.
- Enhance NARBO's role as a change agent by increasing its ability to share knowledge and experiences among stakeholders and policy makers.
- Network at higher policy levels (i.e., national governments, intergovernmental) to obtain more commitments for IWRM and across sectors (i.e., generate broader dialogue and bring in stakeholders that are both using or affecting the river basins).
- Provide a good understanding of which type of RBO applies best to a specific context. A NARBO representative could help explore what the different RBO forms are, so that river basins exploring the creation of an RBO can select which one is best suited to their needs.
- Expand NARBO's frontiers to introduce IWRM in more river basins in the region.
- Compile a compelling case for the region's water practitioners to "sell" IWRM to their national decision makers.

Benchmarking of IWRM Process

To promote IWRM in river basins, tools for identifying the basin issues are crucial. Without knowledge of the level of water security in the river basin, it is not possible to improve. The primary tools for identifying the present situation are the RBO benchmarking and peer review process as well as self-evaluation using the IWRM spiral model.

Gap

The benchmarking process has been successfully implemented in Indonesia, but has not spread much in other basins of the region. This is linked to the fact that Indonesia has received a larger share of ADB operational investment, and has also been the object of the

only IWRM multitranche financing facility (MFF) grant of ADB issued for the Citarum River Basin, which has spurred IWRM in Indonesia.

Recommendations

- Facilitate the expansion of the benchmarking program to other basins in the region, especially for the new NARBO members.
- Adopt the IWRM spiral model widely to identify IWRM progress and issues in each basin.
- Expand the IWRM guidelines to include climate change and other issues.
- Continue providing guidance to institutions and stakeholders wishing to establish a new RBO.

Active Member Participation

Active participation and ownership of the members is crucial to sustain the activities of NARBO, especially with respect to enhancing how RBOs promote their IWRM capacity and, hence, its benefits. For example, even among the founding members, IWRM was not as prominent in ADB and JWA operations as it has become through their active participation in NARBO.

Gap

About 20 of the 84 members have been participating actively in NARBO, concentrated mostly in Southeast Asia and partly South Asia. This is in large measure due to a lack of financing, making it difficult for RBOs with limited funds to travel to meetings and participate in the various NARBO programs.

Recommendations

- Establish more local secretariats in member countries. National secretariats in member countries should be vitalized to promote active participation and contribution to NARBO under the guidance of ADB, ADBI, and JWA. For example, participants in training sessions should distribute outputs through the national secretariat in their country.
- Have each country re-register and strengthen their institution to strengthen NARBO ownership.
- Raise consideration for sustainability of NARBO activities.
- Promote the pride of the members.
- Leverage internet technology (e-learning, video conferencing, and social media).

Global Expansion

To expand its network and influence to the water sector in the world, NARBO is currently working closely with various knowledge partners such as GWP, OECD, and HELP. This wider positioning of NARBO toward the world has been the result of active outreach activities.

There are several spheres of collaboration—bilateral, national, and regional—throughout the network, depending on the nature of the collaboration and the targeted objective. They all seek to improve the RBOs' capacities in irrigation, water supply, stakeholder engagement, water allocation, flood management, and food–water–energy nexus, among

others. These are issues that can be dealt with either in an adversarial context of competing demands or with the deliberate integration approach that underpins IWRM.

In recent years, youth groups have been involved as rapporteurs in NARBO meetings and as participants in study visits. In turn, the youths benefit from a front-row seat to see IWRM in action in the region to become the water leaders of tomorrow.

Gaps

- NARBO is faced with many issues that it cannot tackle alone.
- There has been a lack of interaction with the private sector so far.

Recommendations

- Strive toward attaining the vision of being the first organization that comes to mind when it comes to IWRM at the river basin level.
- Enforce the work with knowledge partners, knowledge hubs, and centers of excellence in different challenge areas.
- Explore opportunities to cooperate with other interregional bodies of river basin practitioners, in Africa and Latin America for instance.
- Continue involvement in global initiatives.
- Work inclusively with different stakeholders, such as economic, financial, and spatial planners, as well as with local governments, water users, academia, and civil society organizations.
- Continue to involve youth groups and benefit from their support.
- Find ways to interface strategically with private sector entities, such as through the World Economic Forum and International Finance Corporation, to tie together the world's water future with its economic future.
- Expand the geographic representation of members, beyond monsoonal Asia.

Better Information Sharing Scheme

NARBO offers countries a platform to learn from each other and gain knowledge on how to adapt approaches for their own countries, for example, as regards climate change or disaster management. Collaboration in NARBO helps facilitate understanding of IWRM.

Gap

NARBO's website is insufficient as a database of IWRM and communication with members.

Recommendations

- Enable easier access to the online database of IWRM and expand contents of the website.
- Improve system of communication with all of the members.
- Strengthen input from members (e.g., annual progress report in view of IWRM).
- Develop a database of member's experiences on IWRM in next 10 years.
- Use e-learning as a good tool to reach the world.
- Enhance use of social media

Emerging River Basin Issues

Climate change is emerging as a challenge to water issues in the future. Some of the RBOs in the region already have significant experience in coping with extreme weather events, which can be shared and disseminated in valuable ways to other RBOs. Time and again, disaster preparedness and planning results in lower rates of death, injury, and damage from extreme weather events in river basins. Other emerging issues include how to further integrate groundwater needs into IWRM, urban water issues (quantity and quality), as well as drought and flood management.

Gap

Water issues will become more complicated and water-related disasters will increase. Many RBOs across the region are insufficiently prepared to cope with this and NARBO can be a leading force in increasing RBOs' preparedness to the impacts of climate change in river basins.

Recommendations

- Focus on adaptation to climate change.
- Adjust management of big reservoirs, cropping patterns, and water allocation to address the impacts of climate change.
- Develop a subsidy system and policy reform to support this.
- Engage in more knowledge sharing and capacity building to help RBOs across the region address these emerging circumstances.

Capacity Development

As NARBO evolves as an institution and new members join, the ongoing NARBO capacity development programs will remain useful. Concurrently, it will be necessary to accommodate different capacity levels and types of RBOs with varying needs and realities. A repository of all types of RBO organizational structures has been developed and shared by CRBOM.

Gaps

- NARBO's twinning activities to date have been more along the lines of short-term exchange visits, rather than in-depth twinning exchanges.
- IWRM is a stakeholder-centered network, which relies on communication links to spread its message. However, engineers, who are at the heart of the IWRM process, have not benefited in most cases from any communication training.
- Institutions are faced with a generational challenge whereby training has to be repeated to reach younger RBO staff members who have not received the training.
- Managing river basins is very complex and it is difficult for water agencies to continuously increase their capacity on issues such as allocation of resources, setting of priorities, innovative financing mechanism, and finding additional resources and opportunities.
- New RBO members around the region (Myanmar and Bhutan) who are just taking their first steps on their IWRM journey need NARBO's experience and support to guide them. This will be the case for upcoming river basins as more come into being.

Recommendations

- Explore among members whether there is the need to expand the twinning program in duration and scope, and scale up if necessary.
- Improve communication skills with different groups of stakeholders for implementation of effective IWRM solutions.
- Apply ADB technical assistance for capacity development of RBOs in member countries.
- Promote “total water professionals” who can relate water issues to the economy, environment, and society in addition to IWRM itself. They should also address how they relate to urban resilience and water quality. A useful procedure for this is the IWRM proficiency certification system.
- Propose new themes for training workshops, such as water allocation, technologies, urban water, groundwater, and especially risk management.
- Bring in specialists through the knowledge partners to provide capacity building support.

Financial Capacity

Over the past 10 years, NARBO’s activities have been financed primarily through ADB’s regional technical assistance contributions as well as JWA’s and ADBI’s contributions. The three organizations have shared the necessary cost of NARBO activities on an equal basis. Member RBOs have contributed by hosting NARBO events and providing in-kind support.

Gap

There is a limited flow of incoming financial resources to support NARBO’s activities.

Recommendations

Facilitate investment programs. ADB’s technical assistance demonstrated the importance and effectiveness of formulating an investment program for IWRM processes. These procedures are worth expanding to the region in collaboration with NARBO.

- Search for and solicit new avenues of financing and financial partners.
- Explore the opportunities for greater financial support from the members themselves.
- Increase the capacity of members to compete for national budget allocations.
- Find opportunities to connect the water ministries to the finance ministries.

Annex 1: Overview of NARBO

Goal and Objective

The goal and objective of the Network of Asian River Basin Organizations (NARBO) are defined in the NARBO Charter:

Goal: To help achieve integrated water resources management (IWRM) in river basins throughout Asia.

Objective: To strengthen the capacity and effectiveness of river basin organizations (RBOs) in promoting IWRM and improving water governance, through training and the exchange of information and experience among RBOs and their water sector agencies and knowledge partner organizations in Asia and to advise on the establishment of RBOs in Asia.

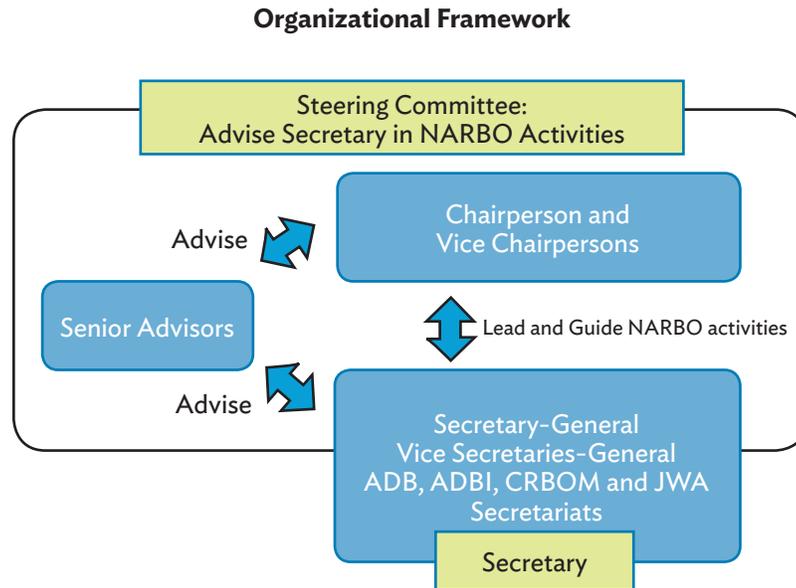
Membership

NARBO membership is open to any organization which belongs to one of the following categories: (i) river basin organization, (ii) national and federal, provincial, or local government organization, (iii) regional knowledge partner organization, (iv) interregional knowledge partner organization, (v) bilateral and multilateral development cooperation agency, or (vi) water-related organization which supports NARBO's goal and objective.



Framework Structure

The following chart shows how the NARBO framework is structured:



ADB = Asian Development Bank, ADBI = Asian Development Bank Institute, CRBOM = Center for River Basin, Organizations and Management, JWA = Japan Water Agency, NARBO = Network of Asian River Basin Organizations.

Chairperson and Vice Chairpersons

Lead the NARBO General Meeting and guide NARBO activities.

Senior Advisors

Advise the NARBO chairperson and secretariat.

Secretary-General and Vice Secretaries-General

Carry out the executive functions of NARBO and propose, plan, and implement initiatives and activities and conduct logistics services.

Steering Committee

Supports the decision making and strategy of NARBO.

General Meeting

Decides on NARBO action plan and selects administrative body for the next 3 years.

Five general meetings have been held so far:

- 1st General Meeting: 24–26 February 2004, Batu, Indonesia
- 2nd General Meeting: 14–16 February 2005, Jatiluhur, Indonesia

- 3rd General Meeting: 20–22 February 2008, Solo/Surakarta, Indonesia
- 4th General Meeting: 9–12 November 2010, Makassar, Indonesia
- 5th General Meeting: 14–20 May 2013, Chiang Mai, Thailand

Action Program

- Advocacy and raising awareness
- Information sharing, good practice, and lessons learned
- Support for NARBO members to improve water governance
- Capacity building of RBOs through training, twinning, and advisory service
- Regional cooperation for transboundary river management

NARBO Members (as of 31 Jan 2015)

No	Country/Region	Organization
River Basin Organization		
1	Indonesia	Perum Jasa Tirta I Public Corporation (PJT I)
2	Indonesia	Perum Jasa Tirta II Public Corporation (PJT II)
3	Indonesia	Bengawan Solo River Basin Organization
4	Indonesia	Pompengan Jeneberang Basin Water National Management Unit
5	Indonesia	Jragung-Tuntang Basin Water Resources Management Unit
6	Indonesia	Pekalan Sampean Basin Water Resources Management Unit
7	Indonesia	Ciujung-Ciliman Basin Water Resources Management Unit
8	Indonesia	Sermo Water Resources Management Unit
9	Indonesia	Citarum Basin Water Resources Management Unit
10	Japan	Japan Water Agency (JWA)
11	Republic of Korea	Korea Water Resources Corporation (K-water)
12	Lao PDR	Nam Ngum River Basin Development Sector Project
13	Malaysia	Selangor Water Management Authority (SWMA)
14	Pakistan	Indus River System Authority (IRSA)
15	Philippines	Laguna Lake Development Authority (LLDA)
16	Sri Lanka	Mahaweli Authority of Sri Lanka (MASL)
17	Thailand	Bang Pakong River Basin Committee (BPRBC)
18	Viet Nam	Cuu Long and Dong Nai River Basin Organization
19	Viet Nam	Red River Basin Organization (RRBO)
20	Viet Nam	Day River Basin Subcommittee
21	Viet Nam	Cau River Sub-basin Organization (CSBO)
22	Viet Nam	Vu Gia Thubon River Basin Organization
23	Viet Nam	Ca River Basin Management Council
24	Southeast Asia	Mekong River Commission Secretariat (MRC)
25	Indonesia	Balai Besar Wilayah Sungai Brantas (BBWS Brantas)
26	Philippines	HELP Davao Network
27	Lao PDR/Southeast Asia	Nam Ngum River Basin Committee Secretariat

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Table continued

No	Country/Region	Organization
28	Lao PDR	Nam Theun-Nam Kading River Basin Committee Secretariat (NT-NKD RBCs)
29	Myanmar	Ayeyarwaddy River Basin Research Organisation (ARBRO)
30	People's Republic of China	Chao Lake Management Authority
31	Thailand	Mun River Basin Organization
Government		
1	Bangladesh	Bangladesh Water Development Board (BWDB)
2	Bangladesh	Local Government Engineering Department (LGED)
3	Cambodia	Ministry of Water Resources and Meteorology (MOWRAM)
4	Cambodia	Department of Hydrology and River Works (DHRW)
5	Indonesia	Directorate General of Water Resources (DGWR)
6	Indonesia	West Nusa Tenggara Regional Office of Water Resources Development (Dinas Pekerjaan Umum Provinsi NTB) (NTB-NARBO)
7	Japan	Water Resources Department, Water and Disaster Management Bureau, Ministry of Land, Infrastructure, Transport and Tourism
8	Lao PDR	Water Resources Department, Ministry of Natural Resources and Environment
9	Malaysia	Department of Irrigation and Drainage (DID)
10	Philippines	National Water Resources Board (NWRB)
11	Philippines	Department of Environment and Natural Resources (DENR)
12	Thailand	Department of Water Resources, Ministry of Natural Resources and Environment (DWR, MoNRE)
13	Viet Nam	Department of Water Resources Management, Ministry of Natural Resources and Environment (MoNRE)
14	Viet Nam	General Office for RBOs in Viet Nam (GO-RBO)
15	Viet Nam	Southern Institute for Water Resources Planning (SIWRP)
16	Viet Nam	Department of Natural Resources and Environment of Dong Nai Province
17	Nepal	Water and Electricity Commission Secretariat (WECS)
18	India	Orissa Water Planning Organization (OWPO)
19	Thailand	Department of Groundwater
20	Pakistan	Pakistan Meteorological Department
21	Bhutan	National Environment Commission (NEC)
Regional Knowledge Partner		
1	Asia	International Centre for Integrated Mountain Development (ICIMOD)
2	Southeast Asia	Global Water Partnership (GWP) (SEA RWP)
3	South Asia	Global Water Partnership—South Asia (GWP-SAS)
4	South Asia	South Asia Network of River Basin Organization (SASNET-RBO)
5	South Asia	The Capacity Building Network for Integrated Water Resources Management South Asia (CapNet SA)
6	Bangladesh	Institute of Water Modeling (IWM)
7	Indonesia	Indonesia Water Partnership (InaWP)

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Table continued

No	Country/Region	Organization
8	Indonesia	Foundation on Water Affairs ADHI EKA (ADHI EKA)
9	Indonesia	Faculty of Engineering, Brawijaya University
10	Indonesia	Research Centre for Water Resources (RCWR)
11	Indonesia	Center for Environment & Civil Engineering Research
12	Indonesia	Post Graduate Study on Water Resources Management Faculty of Engineering Gadjah Muda University
13	Indonesia	SEMBRANI Foundation
14	Japan	Japan River Restoration Network (JRRN)
15	Japan	Graduate School of Management, Kyoto University
16	Japan	Civil Engineering Research Institute for Cold Region, PWRI
17	Malaysia	National Hydraulic Research Institute of Malaysia (NAHRIM)
18	Thailand	Thailand Water Resources Association (TWRA)
19	People's Republic of China	Yellow River Conservancy Commission (YRCC)
20	Pakistan	Pakistan Water Operator Partnership (P-WOPs)
21	India	Advanced Center for Integrated Water Resources Management
22	Pakistan	Pakistan Water Partnership (PWP)
Interregional Knowledge Partner		
1	Interregional	Asian Development Bank Institute (ADBI)
2	Interregional	Asia Pacific Association of Hydrology and Water Resources (APHW)
3	Interregional	International Centre for Water Hazard and Risk Management (ICHARM)
4	Interregional	International Research and Training Center on Erosion and Sedimentation (IRTCES)
5	Interregional	IUCN—The World Conservation Union
6	Australia	International Water Centre (IWC)
7	Interregional	International Water Management Institute (IWMI)
8	Interregional	World Wide Fund for Nature (WWF)
9	Indonesia	Center for River Basin Organizations and Management (CRBOM)
Development Cooperation Agency		
1	Interregional	Asian Development Bank (ADB)

Lao PDR = Lao People's Democratic Republic.

NARBO Member Countries

- Australia
- Bangladesh
- Bhutan
- Cambodia
- China, People's Republic of
- India
- Indonesia
- Japan
- Korea, Republic of
- Lao PDR
- Malaysia
- Myanmar
- Nepal
- Pakistan
- Philippines
- Sri Lanka
- Thailand
- Viet Nam



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Annex 2: List of Integrated Water Resources Management Training Courses

No.	Date	Theme	Country	Host Agency	No. of Trainees
1	26 Jul–6 Aug 2004	Integrated Water Resources Management (IWRM) and Strengthening River Basin Committees	Thailand	Thailand Water Resources Association	20
2	25–29 Apr 2005	River Basin Management and Organization	Sri Lanka	International Water Management Institute and Mahaweli Authority of Sri Lanka (MASL)	27
3	14–18 Nov 2005	Technology for IWRM: River Basin Approach	Rep. of Korea	Korea Water Resources Corporation	20
4	6–10 Nov 2006	Water for All: Lessons Learned and Meeting Future Challenges	Sri Lanka	Mahaweli Authority of Sri Lanka (MASL)	20
5	18–25 Feb 2009	Key for Success with IWRM	Viet Nam	Vu Gia-Thu Bon River Basin Organization	24
6	30 Nov–7 Dec 2009	Keys for Success: Applying the Spiral Model of IWRM at River Basin Level	Viet Nam	Vu Gia-Thu Bon River Basin Organization	19
7	2–9 Nov 2012	Solutions to Water Sector Issues through IWRM: Mahaweli River Basin Experience	Sri Lanka	MASL	26
8	27 Nov–4 Dec 2013	Enhanced Water Security through IWRM: Mahaweli Experience	Sri Lanka	MASL	27
9	12–19 May 2014	Enhanced Water Security through IWRM: Laguna Lake Experience	Philippines	Laguna Lake Development Authority	33
				Total	216

Annex 3: List of Thematic Workshops

The following workshops have been conducted since 2004, attended by delegates from member organizations.

Thematic Workshop on Water-Related Disaster and Its Management in Asian Countries

Based on the action plan of 2006–2007 and 2008–2009, the Network of Asian River Basin Organizations (NARBO) planned a series of three workshops on the theme.

The goal of these workshops was to develop the capacity of key organizations for water-related disaster management by (i) providing basic concepts and principles, (ii) sharing country challenges and strategies, and (iii) formulating an action plan. Three workshops were held: one in Yogyakarta (Indonesia), one in Metro Manila (Philippines), and a study meeting on integrated water resources management (IWRM) including water-related disasters and management in Hoi An, Viet Nam.

Thematic Workshop on Sustainable Management for Water Resources Infrastructure

The objective of these thematic workshops was to improve operation and maintenance of water resources infrastructure by sharing experiences and major issues facing river basin organization (RBO) members and discussing solutions for sustainable management. Four workshops were held on this theme in Ha Noi (Viet Nam), Dhaka (Bangladesh), Colombo (Sri Lanka), and Bangkok (Thailand).

Thematic Workshop on Water Allocation and Water Rights

Workshops on this theme were held in Ha Noi (Viet Nam), Quezon City (Philippines), Bangkok (Thailand), and Saitama (Japan). In addition, a thematic workshop on water rights was held at Asian Development Bank (ADB) headquarters in Manila (Philippines).

As a result of these workshops, a booklet on “water allocation” was released by ADB and the Japan Water Agency within its publication series, and a summary book was disseminated at the 5th World Water Forum in Istanbul, Turkey, in 2009.

Annex 4: List of Twinning Programs between NARBO Members

The following memorandums of understanding (MOUs) for twinning programs have been signed between members of the Network of Asian River Basin Organizations (NARBO):

- The MOU and Agreement of Twinning Program between the Japan Water Agency (JWA) and Indonesian NARBO members was concluded on 29 November 2004: Two JWA staff members were first dispatched to Perum Jasa Tirta (PJT) I headquarters and PJT II headquarters in Indonesia for almost 3 months between 10 April and 9 July 2005. Following the JWA staff members' return, two staff members from PJT I and one from PJT II came to JWA from 12 July to 10 September 2005.
- The MOU and Agreement on Twinning Program between PJT I, PJT II, and Korea Water Resources Corporation (KOWACO) was signed on 15 December 2004: Three Indonesian NARBO staff members (from the Ministry of Public Works, PJT I, and PJT II) were dispatched to the Republic of Korea for about 3 weeks between 5 and 30 September 2005.
- In 2006, between Japan and Indonesia: Four JWA staff members were dispatched to Indonesia from 14 to 25 May, after which four Indonesian NARBO staff members (two from the Ministry of Public Works, one from PJT I, and one from PJT II) were then dispatched to Japan from 11 to 25 June.
- In 2007, between Japan and Indonesia: Three staff members of Indonesian NARBO members (two from PJT I and one from PJT II) were dispatched to JWA for 1 month between 11 and 25 June.
- The MOU and Agreement of Twinning Program between JWA and Viet Nam's NARBO members was concluded on 15 March 2008: Staff from the Ministry of Agriculture and Rural Development of Viet Nam were dispatched to JWA from 17 November to 6 December 2008.
- In 2009, between Japan and Sri Lanka: Four staff members of the Mahaweli Authority of Sri Lanka were dispatched from 11 to 30 May and two JWA staff members were dispatched to Sri Lanka from 4 to 16 February.
- In 2009, between Japan and Viet Nam: Two JWA staff members were dispatched to Viet Nam from 2 to 6 November. Following this, three staff members of the Ministry of Agriculture and Rural Development of Viet Nam were dispatched to JWA from 10 to 26 November.

- In 2011, between Japan and Viet Nam: Two staff members of JWA were dispatched to the Ministry of Agriculture and Rural Development of Viet Nam from 5 to 26 September. In return, 12 staff members from Viet Nam were dispatched to JWA from 15 to 24 November.
- In 2012, between Japan and Viet Nam: Twelve staff members from the Ministry of Agriculture and Rural Development and ministry-related organizations in Viet Nam were dispatched to JWA from 14 to 21 September.

Annex 5: Examples of Twinning Program Agendas

Twinning Program between Japan Water Agency and Perum Jasa Tirta I and II

Dispatch of Japan Water Agency (JWA) to Perum Jasa Tirta (PJT) I and PJT II: 10 April–9 July 2005

Objectives

- (i) Share PJT I and PJT II good basin practices with JWA.
- (ii) Advise on a plan for PJT I and PJT II by comparing with JWA practices.
- (iii) Assist in the process of formulating a project on water resources management in Indonesia.

Activities

- (i) Gather and understand existing basin management situation with survey for management area of PJT1 (Brantas and Solo) and PJT2 (Citarum), Semarang, and Jakarta.
- (ii) Define and review targets.
- (iii) Confirm existing and future plan.
- (iv) Evaluate countermeasures to basin problems.
- (v) Prepare report.

Dispatch of PJT I and PJT II to JWA: 12 July–10 September 2005

Objectives

- (i) Strengthen capacities on integrated water resources management (IWRM) through continuous sharing of information and experience to solve basin problems, as well as to continue activities toward improving IWRM in Asia.
- (ii) Share JWA good basin practices with PJT I and PJT II.
- (iii) Develop good relationships between JWA and PJT I and PJT II.

Activities

- (i) Gather and understand existing basin management situation with survey for Tone canal, Toyokawa canal, Tokuyama dam, Hiyoshi dam, and Lake Blwa development project.
- (ii) Prepare target for on-the-job training for financial, corporate management, and technical aspects.
- (iii) Prepare report.

Twinning Program between K-water and Ministry of Public Works of Indonesia, Perum Jasa Tirta I and II

Dispatch of Ministry of Public Works of Indonesia, PJT I, and PJT II to K-water: 5–20 September 2005

Objective

Strengthen capacity on IWRM through information and experience exchange.

Activities

- (i) Diagnose IWRM practices in Geum River Basin in the Republic of Korea.
- (ii) Conduct training on
 - rainfall–runoff analysis using rainfall–runoff forecasting system software;
 - water quality modeling using Qual2E-Plus, Koriv1-Plus, and CE-Qual2-W2 software; and
 - reservoir operation system for integrated real-time water management system using K-MODSIM and SSDP software.

Dispatch of K-water to PJT: 20–24 June 2005

Objective

Strengthen capacity on IWRM through information and experience exchange.

Activities

- (i) Discuss basin management practices in the Citarum River Basin.
- (ii) Conduct technical site visit to Citarum River Basin.

Annex 6: Manila Declaration



Manila Declaration

We, representing the members of the Network of Asian River Basin Organizations (NARBO), having met in Oakwood Premier Joy~Nostalg Center in Manila, Philippines, on 19-20 November, 2014 at the High-level Panel on 'Looking back a decade of NARBO Achievements and identifying the future direction of NARBO' convened to celebrate NARBO's 10-year anniversary, review NARBO's achievements and foresee NARBO's future, hereby:

- Recognize that IWRM is a useful concept to cope with the complex issues affecting water security such as, water-food-energy nexus and climate change;
- Re-affirm that IWRM is an adaptive management process that adopts an inclusive approach bringing stakeholders together to increase water security and improve water governance in river basins;
- Re-acknowledge significance of River Basin Organizations (RBOs) as champions that implement IWRM in their river basins, and believe that benchmarking contributes to improving their performance;
- Continue to use the UNESCO/NARBO 'IWRM Spiral' model and related training for improving IWRM capacity, and using locally adapted guidelines for implementing IWRM in our river basins;
- Endeavour to enhance our contributions to NARBO by active participation in regional activities for sustainability and to increase country-level NARBO activities for better networking in our countries;
- Believe that in the spirit of sustaining existing efforts and further achieving water for all, young leaders should be trained, supported and involved in IWRM;
- Continue to ensure gender balance in NARBO activities;
- Resolve to contribute to the achievements of the international goals on IWRM such as, the POST-2015 Agenda (Sustainable Development Goals) and OECD Water Governance Initiatives; and
- Endeavour to improve our engagement with donors, UN-agencies, civil society, private sector, decision-makers and with actors outside the water sector to ensure that water is integrated into key socio-economic development decisions.

We strive as a network to uphold these commitments to the best of our abilities.

Manila, Philippines
20 November 2014

NARBO: A Decade of Achievements (2004–2014)

Promoting Integrated Water Resources Management and Improving Water Governance

Rapid population growth and economic development jeopardize water security in Asia, giving further emphasis in the global agenda to the need for improved water governance.

In order to address Asia's water security issues, an integrated and comprehensive approach for better water resources management is essential. The Network of Asian River Basin Organizations (NARBO) was launched in 2004 to promote integrated water resources management (IWRM) and improve water governance in the region.

NARBO seeks to promote IWRM in Asia and has continuously advocated capacity-building activities for a better understanding of IWRM in Asian river basin organizations. This publication commemorates the 10-year anniversary of NARBO's founding and features a collection of narratives from water management practitioners across the region. These provide insights for the future direction of NARBO and highlight the necessity of improved water governance to tackle the water crisis in Asia.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to approximately two-thirds of the world's poor: 1.6 billion people who live on less than \$2 a day, with 733 million struggling on less than \$1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

About the Asian Development Bank Institute

ADB, located in Tokyo, is the think tank of the Asian Development Bank (ADB). ADBI's mission is to identify effective development strategies and improve development management in ADB's developing member countries. ADBI has an extensive network of partners in the Asia and Pacific region and globally. ADBI's activities are aligned with ADB's strategic focus, which includes poverty reduction and inclusive economic growth, the environment, regional cooperation and integration, infrastructure development, middle-income countries, and private sector development and operations.

About the Center for River Basin Organizations and Management

Center for River Basin Organizations and Management has recently been established by Ministry of Public Works, Indonesia, as a member of the Asia-Pacific Water Forum network of regional knowledge hubs. The center is located in Solo, Central Java, together with several agencies involved in river basin management and river engineering. Building on the comprehensive expertise of River Basin Organizations in Indonesia and elsewhere in Asia, the center will compile, produce and share expertise within IWRM-based, development-oriented river basin management. By its own capacity, or jointly with partners, the center will undertake research and development, produce documentation, and provide advisory services and education.

About the Japan Water Agency

JWA has implemented the development and management of water resources including flood management for each of the seven river systems which are involved with the lives of more than half the population of our nation, with a mission to support an affluent and healthy life of the people through the utilization of water resources for as long as half a century. The water volume developed by JWA accounts for 90% of the seven river systems and we manage the over 50 facilities. JWA activities range widely from securing water for domestic, industrial and agricultural use, controlling floods, to maintenance and improvement of the river environment.



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