

Part A (Day1)

Contents of the Brochure for Study Visits

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THE THIRD GENERAL MEETING OF NARBO

INTRODUCTION TO THE STUDY VISIT PROGRAM

(February 20, 2007)

BACKGROUND PAPER ON THE BENGAWAN SOLO RIVER BASIN

I. INTRODUCTION

1. Physical Condition and Boundaries

The Bengawan Solo River has been important to the welfare of the people, since ancient times. The river basin that is located in central and eastern part of Java, needs a comprehensive development and management plan to provide the valuable resource of water – increasingly necessary – for support to the present economic and social growth at Java, the most populous island in Indonesia. A map of the Bengawan Solo River Basin is shown at the front of this report.

The Bengawan Solo River system has a total catchment area of 20,125 km² and consists mainly of the Bengawan Solo River Basin with an area of 16,100 km², Grindulu River Basin 750 km² and Lamong River Basin 720 km². The remaining area, approximately 2,555 km² consists of the Northern Java River Basin that comprises peripheral rivers which directly flow into the Java Sea, like Kali Grasak, Kali Kemawing, Kali Klero and Kali Lohgung, and the Southern Java River Basin that flows into the Indonesian Ocean.

The Bengawan Solo River Basin has a precipitation potential of 2.100 mm/year, of which close to 1.040 mm or equivalent to 16.7 km³ surfaces as overland flow. The surface water in the river discharge fluctuates during the year. Groundwater potential is estimated to be 2.1 km³. From the available flow for the whole Bengawan Solo River System, 21% is available for bulk-consumption, 23% of the available flow for the Bengawan Solo river basin. Table 1 shows surface water potential and consumed use for the river system. **Figure 1.1** displays cumulative surface water potential in the Bengawan Solo basin.

Table 1 Surface water potential and consumed use through the Bengawan Solo River System

River Basin	Surface Water km ³	Consumed Use km ³	Ratio %
Bengawan Solo River Basin			
Upper Bengawan Solo	6.286	1.974	31
Lower Bengawan Solo	6.494	0.509	8
Madiun River	3.897	1.364	35
Northern Java River Basin	2.500	0.188	8
Lamong River Basin	0.754	0.120	16
Southern Java River Basin	0.921	0.132	14
Total (Bengawan Solo System)	20.833	4.287	21
Total (Bengawan Solo RB only)	16.677	3.847	23

Problems in the Bengawan Solo River System could be described as follows:

- a. During the rainy season, the Bengawan Solo River inundates its corridor which causes disaster to the

inhabitants. Flood-prone areas in the river system comprise the Lower Bengawan Solo, especially between Cepu and Tanjungkepala (Gresik), Madiun River between Ngawi and Ponorogo, Grindulu and Lorog River near Pacitan, and Upper Bengawan Solo near Sragen. The flood-prone area is estimated close to 8% of the total river system area. The most severe flood recorded by the Bengawan Solo River Basin Development Project was in 1966 with an inundated area of 142.000 ha, compared to the latest one of 1994 which inundated 40.000 ha. The following Table 2 provide an insight to the disaster scale of flood in the Bengawan Solo River Basin.

Table 2 Major flood damages in the Bengawan Solo River (OECF, 1991 & Jasa Tirta, 2008)

No	Item	Unit	1966	1968 ¹	2007 ²
1	Inundation area	Ha	142,000	120,000	119.800
2	Affected population	persons	880,000	670,000	898.000
	Died/missing		168	16	77
	Affected/displaced		> 370,000	> 140,000	> 221.240
3	Houses damage	Nos	182,000	152,000	93.273
	Broken		10,100	8,100	
	Inundated		171,900	143,900	240.000

- b. Drought during the dry season poses another problem for most of the river system area. As a matter of fact, from 545,000 ha of paddy fields in the Bengawan Solo River Basin, 163,000 ha are dependent on rain-fed water. During dry season, drought sweeps over 80% of the irrigated paddy fields in the basin.³ This condition shows that improper water management is recurring throughout the season in the basin. Even the OTCA master plan, 1974, reports surface water in the basin at an estimate of 16.7 billion cubic-meters/year, but it is important to notice here, that run-off fluctuation varies much from season to season, about 65% during the dry years and 160% during wet years. Surface water potentials in the basin; can be seen in Table 4.
- c. Land use in the Bengawan Solo River Basin is much characterized by dormant and active volcanoes, like Merapi, Merbabu and Lawu, in both its fertile uplands and alluvial lowlands, which are mainly found in the lower reaches. Agriculture is one most important land use throughout the basin, where 54.8% was used for paddy cultivation and dry land farming in 1998. Erosion as a result of improper land use practices is common in the basin, which results in sedimentation of the river and water infrastructures, especially the reservoirs. Change in land use is an important factor that affects the watershed; as well as the erosion and sedimentation process. This change can be seen in Table 5. More paddy fields were developed in 1998 than in 1974, either up-land farming or yards, but in a broader sense this does not represent assurance of good land conservation.

¹ Flood damage in upper Solo river basin occurred in 1968 is excluded

² Flood on December 26-27, 2007 extended into 2008. Inundation was present until early February 2008.

³ In the tropical monsoon of Asia, short and long spells of dry and wet seasons interchange during the year. Available rain water collected during the wet period has to be conserved, and managed for future use. This gave rise to the parallel development of advanced hydraulic civilizations in ancient Southeast Asia, including Indonesia. As in the past, today this limited resource is subjected to multiple and frequent conflicting demands.

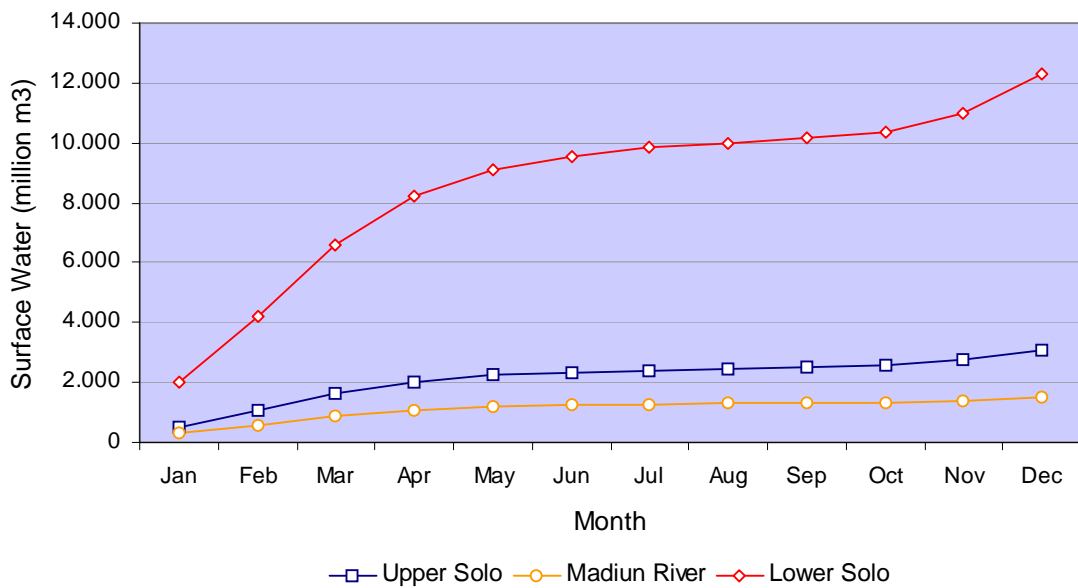


Figure 1 Cumulative surface water potential in the Bengawan Solo River Basin

2. Development of Bengawan Solo River Basin

Development of Bengawan Solo River Basin has been undertaken by an agency responsible for developing the entire basin, namely the Bengawan Solo River Basin Development Project (in Indonesian: *Proyek Bengawan Solo*, abbreviated as PBS) in 1969. The objective of the Project is an overall basin development comprising river improvements for flood control and drainage, watershed management and water resources development.

Project activities in the river basin are directed towards improving public welfare and accelerating economic development both nationally and regionally. Through a number of changes in the 1990s, Bengawan Solo River Basin Development Project was converted into PIPWSBS (*Proyek Induk Pengembangan Wilayah Sungai Bengawan Solo*) and made fully responsible for the implementation and operation of all water resources development projects within the Bengawan Solo river basin.

Recently, in 2007 the PIPWSBS was transformed into the River Basin Development Agency, in Indonesian, *Balai Besar Wilayah Sungai* (abbreviated as BBWS) Bengawan Solo through a decree from Ministry of Public Works. Most of the former responsibilities remain within this agency but additional tasks, such as conducting hydrological monitoring and surface water quality monitoring were added.

An overall development master plan for the Bengawan Solo River Basin was formulated under technical assistance from the Overseas Technical Cooperation Agency, Japan (OTCA) in 1974. The 1974 OTCA's master plan emphasizes water resources development for irrigation, flood control, and hydroelectric power generation. In line with this overall plan, various projects have been realized by PBS, as shown in Table 3.

Table 3 Various projects undertaken by the Bengawan Solo River Basin Development Project

No.	Name of Project	Stage	Period	Foreign Agency
1	Wonogiri Multipurpose Dam	F/S	1974-1975	JICA
		D/D	1976-1978	OECF
		C	1979-1982	OECF

No.	Name of Project	Stage	Period	Foreign Agency
2	Wonogiri Irrigation (including irrigation extensions)	F/S	1975-1976	JICA
		D/D	1977-1979	OEFC
		C	1980-1990	OEFC
3	Upper Solo River Improvement	F/S	1974-1975	JICA
		D/D	1983-1985	OEFC
		C	1987-1994	OEFC
4	Madiun River Urgent Flood Control	F/S	1980	JICA
		D/D	1983-1985	OEFC
		C	1987-1991	OEFC
5	Lower Solo River Improvement	F/S	1983-1986	CIDA
		D/D	1991-1993	OEFC
		C	1994-2001	JIBC

The river infrastructure has contributed much to the water system in the basin, for electricity, irrigation; municipal and industrial bulk water supply. As the total investment for water resources infrastructures in Bengawan Solo River Basin is recently about Rp 1.3 trillion, at year 2000 prices (excluding land compensation), Bengawan Solo River Basin Development Project currently encounters the problem of funding the cost of operation and maintenance, which is assumed to be 1% to 2% of water resources infrastructure investment.

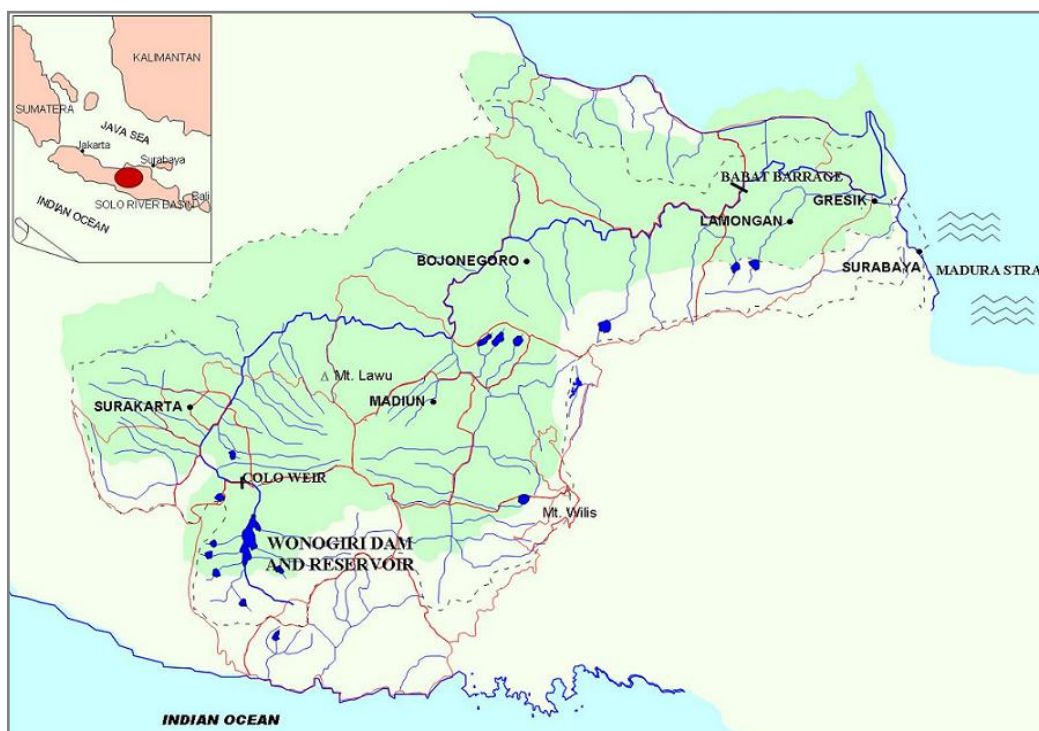


Figure 2 Bengawan Solo River Basin (C.A. of 16.100 km²) encompasses Central and East Java Province

As the biggest river basin in the densely populated island of Java, Bengawan Solo flows through Central and East Java Provinces, and passes 20 regencies and municipalities.⁴ Regencies and municipalities are administrative units within a province with a certain degree of freedom in conducting governance over the population within their boundaries. Decentralization process of the Government of Indonesia (GOI) relates on distributing authority and responsibility to both the provincial and regencies/municipalities level.

⁴ Regencies: Boyolali, Klaten, Wonogiri, Karanganyar, Sukoharjo, Grobogan, Sragen, Ponorogo, Magetan, Ngawi, Madiun, Blora, Tuban, Rembang, Bojonegoro, Lamongan and Gresik. Municipalities: Surakarta and Madiun.

Table 4 Surface water potential in the Bengawan Solo River System (CDMP, 2000)

River	Station	C.A. km ²	Years	Month (in m ³ /second)												Average
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Lower B. Solo	Babat	14.247	'54-'99	749	922	876	632	339	165	112	55	53	83	248	488	393
Upper B. Solo	Jurug	3.220	'68-'94	186	225	230	142	79	32	20	17	24	37	67	111	97
Madiun R.	A. Yani	2.294	'63-'92	106	114	110	84	50	20	8	3	6	11	20	53	49
Grindulu R.	G. Sari	249	'80-'93	43	48	36	33	19	4,5	6,7	3,2	2,6	6,6	21	33	21
Sulang R.	Sulang	45	'88-'93	2,1	1,6	1,5	1,1	0,5	0,6	0,2	0,2	0,3	0,3	0,5	1,3	0,8
Lamong R.	Boboh	566	'88-'93	42	48	40	30	14	11	6,1	3,7	4	2,6	7,9	34	20

Note: Grey-scaled columns show the wet season discharge

Table 5 Change of land use in the Bengawan Solo River Basin

Sub Basin	Wet Paddy Cultivation		Upland Farming		Yards		Forests		Others	
	1974	1998	1974	1998	1974	1998	1974	1998	1974	1998
Upper Solo	183.800	161.200 ↓	137.500	133.900 ↓	123.700	133.900 ↑	32.800	53.500 ↑	36.200	42.500 ↑
Madiun River	147.900	145.700 ↓	44.300	63.800 ↑	85.900	72.900 ↓	119.900	123.000 ↑	9.400	15.800 ↑
Lower Solo	213.500	278.800 ↑	145.900	197.000 ↑	65.800	73.800 ↑	189.400	229.700 ↑	26.500	28.400 ↑
Pacitan Area	—	14.200	—	83.500	—	25.000	—	19.600	—	8.300
Total (Excluding Pacitan)	545.200	599.900	327.700	439.800	275.300	305.600	342.000	425.900	72.300	124.800

Source: 1) Data from 1974 was taken from the OTCA Master Plan, where data for Pacitan area is not available
 2) Data from 1998 was taken from CDMP Study (2000)

II. INSTITUTIONAL ARRANGEMENTS

1. Basic Principles of Water Management in Indonesia

The Government of Indonesia has enacted Laws No. 7 on Water Resources with an aim of promotion of Integrated Water Resources Management at basin level. Out of 3 river basins had been managed by Corporate Type River Basin Organization i.e. Jasa Tirta I and Jasa Tirta II Public Corporation, in the year of 2007, under the new laws and regulation, the Central Government establishes 30 (thirty) Public Utility Type River Basin Organizations under the jurisdiction of the central government. In collaboration with provincial government, Government of Indonesia has established also 50 (fifty) Public Utility Type River Basin Organizations under jurisdiction of the provincial government. In the new laws and regulations illustrate the RBOs position as an organization in charge of water resources management at river basins level. It means the River Basin Organization are required to take consultation and their participations in increasing capacity and applying better water resources management and technology in its river basin.

The basic principle of water management under the context of Water Law No. 7/2004 is involving the effort to plan, implement and monitor as well as evaluate the subsequent implementation on water conservation, utilization, and mitigation of water resources disastrous potentials. While the water resource planning refers to in this context (which is just at the beginning stage in Indonesia) is the comprehensive plan, making use of integrated approach for subsequent implementation of water resources management under the principle of “one river, one plan, and one integrated system of management”.

2. River Basin Organization in Indonesia

Basically River Basin Organizations in Indonesia can be divided into 2 (two) types i.e. corporate type (Jasa Tirta I and II Public Corporation) and river basin development agency (BBWS). Financial source of the corporate type RBO and river basin development agency is mainly coming from water users and National Budget respectively.

Corporate Type

Jasa Tirta I and II Public Corporation (PJT I and PJT II) were established as a pilot of a new concept of corporatization in water resources management, i.e.: a river basin that is managed by a neutral and professional institution who applies in balanced between healthy corporation principles and accountable public service norms on water resources, based on the principle of “One River, One Plan, One Integrated Management” supported by public, private and stakeholders participation.

Main task of Jasa Tirta I and II Public Corporation is to conduct operation and maintenance of water resources infrastructures in Brantas, Bengawan Solo and Citarum River basin. Scope of works of Jasa Tirta I and II Public Corporation are:

- a. Preparation of water allocation and drought allocation plan for Provincial Water Resources Management Committee (*Panitia Tata Pengaturan Air* abbreviated as PTPA) approval and bulk water allocation based on the agreed plan and user licenses;
- b. Planning and operating the flood control and the flood forecasting and warning system;
- c. Undertaking watershed management in cooperation with related agencies;
- d. Provision of technical recommendation for water licensing; and
- e. Undertaking water quality monitoring, provision of technical recommendations for wastewater discharge and

participation in the «clean river program».

Concerning operation and maintenance of water resources infrastructures, tasks of PJT I include development and implementation programs concerning:

- a. General maintenance and some less expensive rehabilitation of infrastructure;
- b. Sediment removal in reservoir and river channel;
- c. Monitoring and controlling sand mining activities in rivers;
- d. Preparation land use plans (especially in the green belt area of the reservoirs and river corridors); and
- e. Providing technical recommendation for licensing of river corridor utilization and its monitoring.

Many aspects of IWRM and water governance system were developed and implemented in the Brantas, Bengawan Solo and Citarum River Basins. River infrastructures in the basins are in better condition, basin productivity and public awareness as well as user's contributions for financing O&M activities increase significantly. The key success factor to have supports from stakeholders is stakeholder satisfaction. Brantas River Basin under PJT I is the first river basin in Indonesia and in Asia as well who applies Quality Management System of ISO 9001 for design, operation and maintenance of water resources and infrastructure since 1997 as commitment of PJT I to achieve stakeholders' satisfaction through continuous improvement of the system and responsive actions on stakeholders' complaints. Since 2001, PJT I is also involved in managing water resources infrastructure in the Bengawan Solo, although full-fledged management system as in the Brantas River Basin is not yet implemented until 2007.

Besides applying Quality Management System of ISO 9001, Jasa Tirta I Public Corporation also having Certification of SNI-19-17025-2000 (ISO/IEC 17025) for its Water Quality Laboratory. Based on the assessment result carried out by National Accreditation Committee (this committee has been acknowledged by Asia Pacific Laboratory Accreditation Cooperation (APLAC) and International Laboratory Accreditation Cooperation (ILAC) for test laboratory accreditation system) on May 17-19, 2004, the Water Quality Laboratories of Jasa Tirta I Public Corporation have fulfilled the conditions as test laboratory and have the rights to obtain its Certification of SNI 19-17025-2000.

The consideration of Jasa Tirta I Public Corporation to implement quality system of SNI 19-17025-2000 is to anticipate the stakeholders' requests and management necessity toward augmentation of the service and to create water quality analysis and monitoring system that fulfilled the International standards that finally would yield precise water quality data, efficient, effective and consistent monitoring system in order to improve the best performance of the corporation.

River Basin Development Agency Type

River basin development agency (abbreviated in Indonesian as BBWS) is a public utility type RBO were established that have an overall function in managing water resources management in river basin basis. In 2007, the Central Government establishes 30 (thirty) river basin development agency under the jurisdiction of the Central Government. Some of them have been appointed as pilots of basin water resources planning and basin water resources management program.

BBWS is responsible for implementing the management of water resources covering the planning, construction, operation and maintenance in the areas of water resources conservation, water resources development, water resources efficiency and control of water damaging power in the river basin. According to decree of the Ministry of Public Works No. 12/PRT/M/2006, BBWS should perform the following functions when a PJT is not present:

- a. Preparation of water resources management scheme and plan in the river basin
- b. Preparation of plan and implementation of management of protected water source area in the river basin
- c. Water resources management covering water resources conservation, development, water resources efficiency and control of water damaging power in the river basin
- d. Preparation of technical recommendation and provision of permit for the preparation, allocation, use and exploitation of water resources in the river basin
- e. Operation and maintenance of water resources facilities in the river basin
- f. Management of hydrological monitoring system
- g. Preparation of water resources data and information
- h. Facilitation for the activity of coordination team for water resources management in the river basin
- i. Community empowerment in water resources management

III. ASSESSMENT OF THE CURRENT IWRM IN BENGAWAN SOLO RIVER BASIN

In order to provide understanding of the current IWRM practice in the Bengawan Solo River Basin, an initial assessment using the generic IWRM road map developed by Asian Development Bank (ADB) was conducted.⁵ Result of the initial assessment can be viewed as the following Table 6. Score of this road map is ordered as follows: 0 for condition whereupon no clear or present status for IWRM element is founded in the basin; 2 for IWRM on its way; and 4 is given when IWRM is getting results.

End score is founded as 58 out of 100. Thus it could be concluded that the current status of IWRM in the Bengawan Solo River Basin is on going, with respective results but still in need of further improvement and managerial development.

Table 6 Assessment of the current IWRM practice in Bengawan Solo River Basin

IWRM Element	IWRM Current Status	Score
River basin organization	PJT I was established under the Government Decree No. 93 of 1999, with clear mandate and organizational-set-up; and improves its performance through capacity building programs, like implementing quality assurance based management and good-corporate governance. BBWS Bengawan Solo was established as transformation of the former PIPWS Bengawan Solo by decree of the Ministry of Public Works in 2007. Responsibilities of the BBWS comprises infrastructure development, major repair and rehabilitation of water resources infrastructure.	4
Stakeholder participation	In both the Brantas and Bengawan Solo River Basin, regular and meaningful stakeholder participation is present. Stakeholder participation is envisaged under the framework of surface water allocation and user rights, most notable through the PTPA and PPTPA committees. However, this participation is limited, and in accordance to the Law No. 7 of 2004, further participation is possible.	4
River basin planning	A river basin plan or strategy exists as basis for basin investments. The basin plan was developed stage-wisely. Initial plan was drawn in 1974, but the plan gets updated in 2001 and 2005, with participation and ownership of basin stakeholders. Even though a basin plan exist, investment remains mostly in the pocket of	2

⁵

Road map can be viewed at: <http://www.adb.org/water/wfp/basin-roadmap.asp>.

IWRM Element	IWRM Current Status	Score
	government, due to the circumstances where the existing water service fee covers only the O&M costs.	
Public awareness	Public awareness programs for IWRM has just been introduced; and are minimal in scope	2
Water allocation	Water allocation among uses and geographical areas is implemented in the basin but limited. This is subject for improvement, including for participatory and negotiated approaches.	2
Water rights	Water user rights or entitlements administration are implemented well, based on the Law on Water Resources. Abstraction permits acts as main regulating instrument of the right. Even farmers and customary water users of local communities and farmers and farmer organizations constitutes the biggest user group, they are not subject to water service fee, thus making irrigation efficiency low in certain areas within the basin.	4
Wastewater permits	Legally a system of wastewater discharge permits and effluent charges exists, but implementation within the basin is still difficult.	0
IWRM financing	Government budget for IWRM is institutionalized at some levels of governance. IWRM financing is spend either at the reGENCY or municipality level, or provincial, but most of it at the national level, sourcing from the national budget.	4
Economic instruments	A system of raw water pricing and/or other economic instruments is enforced in the basin. The system provide share in IWRM costs, stimulate water demand management and to a certain extend conservation. Obstacle of the system is that the tariff remain low and is a political product of the related government institution, water users vis a vis the RBO. Revenue from water service fee covers only the basic O&M, thus making most of the water service to the farmers and public services subject to public service obligation fund from the government.	4
Regulations	Legal and regulatory framework to implement the principles of IWRM and its financing is not satisfactorily enforced	2
Infrastructure for multiple benefits	Several water resources infrastructures exist; and with scope to improve management	4
Private sector contribution	Private sector participation in IWRM is partly introduced but limited due to low return value of investments.	2
Water education	IWRM is occasionally introduced in school programs	2
Watershed management	Minimal investment to protect and rehabilitate upper watersheds; with little collaboration with local communities and civil society organizations	2
Environmental flows	A policy and implementation framework for introducing environmental flows is considered, but it's existence is weakly enforced due to the limited capability in controlling most of the flow downstream.	2
Disaster management	Separate and minimal investments in combined structural and nonstructural interventions to reduce vulnerability against floods, droughts, chemical spills and other disasters.	2
Flood forecasting	Flood forecasting and warning systems exist but does not work and need urgent improvement due lack of maintenance and operation costs.	2
Flood damage rehabilitation	Government provides limited budget allocation for the rehabilitation of infrastructure after floods. But complete assessment is under going in order to improve.	2
Water quality monitoring	Basin-wide water quality monitoring; and adequate application of standards.	4
Water quality improvement	A few structural or nonstructural interventions that reduce point and non-point water pollution, but with no direct result in improvement.	2
Wetland conservation	Limited or no investment to conserve and improve wetlands.	0
Fisheries	Limited measures to protect and improve fisheries	2
Groundwater management	Groundwater management is either just starting or is weakly enforced. Groundwater is in the jurisdiction of Ministry of Energy, Minerals and Mining. Evaluation and enforcement is weak.	2

IWRM Element	IWRM Current Status	Score
Water conservation	A policy and implementation framework to promote efficiency of water use, conservation, and recycling is weakly enforced	2
Decision support information	No river basin information systems to support IWRM	0
Total Score		58

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 Raymond Valiant

THE THIRD GENERAL MEETING OF NARBO

INTRODUCTION TO THE STUDY VISIT PROGRAM

(February 20, 2007)

SEDIMENTATION PROBLEM AND WATER ALLOCATION WITHIN THE BENGAWAN SOLO RIVER BASIN (WONOGIRI RESERVOIR)

I. OBJECTIVES OF STUDY VISIT

This handout serves as an introduction to the study visit program which is an integrated part of the Third General Meeting of the Network of Asian River Basin Organizations (NARBO). This introduction is aimed to provide participants with background on the sedimentation and water allocation problem in the Bengawan Solo River Basin. Even though this study will only visit Wonogiri Reservoir and Colo Weir, it is foreseen that the scope of this study is at basin-wide scale.

Objectives of this study visit are as follows:

1. Sharing the present status of the reservoir sedimentation problem and countermeasures of a NARBO members' country in a typically Asian monsoon affected basin.
2. Foster learning process on challenges, solutions and lessons learned in water allocation and sedimentation, which are increasing concerns over Asia.

Study visit will be arranged as follows:

<u>Time</u>	<u>Schedule</u>	<u>Remarks</u>
07.45-08.00	Preparation for departure	
08.00-09.00	Travel to Wonogiri	By bus and coach
09.00-10.00	Meeting with the Wonogiri Regency Administration	
10.00-10.15	Travel to confluence of Keduang River and Wonogiri Dam	
10.15-12.00	Site visit & dialogue with reservoir management representative and dialogue with the farmer's water users association	Explanation on site
12.00-12.30	Lunch break	Wonogiri Dam Office
12.30-13.00	Travel to Colo Weir	By bus and coach
13.00-14.00	Site visit at Colo Weir	Explanation on site
14.00-15.00	Travel back to the hotel	

II. INTRODUCTION

Combination of both naturally occurring conditions and human's actions created a distinctive pressure on water resources in most Asian countries. Climate change and natural variability in the distribution and occurrence of water are the natural driving forces that complicate the sustainable development of the present water resources potentials. Climate change associated with global warming is having a significant impact on weather patterns, precipitation and the hydrological cycle, affecting surface water availability, as well as soil moisture and groundwater recharge.

At the present moment, many regions in the world are strangled by surface water availability. In Asian countries that are affected by the monsoon, disparity during the rainy season (where water is abundant and often destructive) and the dry season (where water become scarce) is becoming a growing problem. Construction of dams to create reservoirs has been a classical response to growing demands for water to provide hydropower energy, irrigation, potable supplies, fishing and recreation, as well as to lower the impacts and risks to our well-being from high-intensity events such as floods and droughts. These facilities collect natural runoff, frequently quite variable in its location, duration and magnitude, and store it so that its availability is more constant and reliable. But, the severe sedimentation in many reservoirs in the world has decreased their storage capacities which finally will affect water supply to the downstream users.

It is estimated that total of man-made water storage facilities (reservoirs) in the world is close to 4.500 km³ and quoting Keller et.al. (2000), it is estimated that close to 1% or 45 km³ of it is annually lost due to sedimentation (Palmieri et.al., 2003).

Sediments occur in water bodies both naturally and as a result of various human actions. When they occur excessively, they can dramatically change our water resources. Sediments occur in water mainly as a direct response to land-use changes and agricultural practices, although sediment loads can occur naturally in poorly vegetated terrains and most commonly in arid and semiarid climates following high intensity rainfall.

III. PRESENT CONDITION OF THE WONOGIRI CATCHMENT AREA

Due to the population pressure, of the Wonogiri Reservoir catchment, at the present moment about 90% of the total land has been cultivated with dry-land farming that is categorized as highly fragile to surface soil erosion. While forests covers only 10% of the catchment. These values indicate a high population density in the catchment. The Wonogiri reservoir is rapidly filled with sediments transported from the catchment.

Poor land use of its catchment and intensive farming of annual crops using poor practices on the highly erosive and steep-sloped uplands as well as highly populated and intensely farmed areas are the main causes of the sedimentation of the Wonogiri Reservoir. A preliminary assessment of the current state of sedimentation indicated that the effective reservoir capacity has decreased to nearly 60% of the original one. It could be said that, provided that any countermeasure is not taken for the sedimentation problem of the Wonogiri Reservoir, it would lose its functions such as water supply, flood control because of decrease of the storage capacity in the near future.

Especially, the intake structure that feeds water to the powerhouse and downstream irrigation system has been seriously affected by sediment deposits at and around the intake structure. There was a fear that the intake structure be completely clogged with sediments.

To cope with the sedimentation problem of the Wonogiri reservoir, the Government of Indonesia (GOI) requested the Government of Japan (GOJ) to implement the grant aid project. The request covered: (i) construction of two check dams on the Keduang River close to the dam to mitigate sediment inflow into the reservoir; (ii) urgent sediment dredging in front of the intake structure in order to assure the stable and continuous water supply, and (iii) providing a permanent dredging system to

allow sustainable maintenance dredging of sediment deposited in front of the intake.

The project is dubbed «Urgent Countermeasures for Sedimentation in the Wonogiri Multipurpose Dam Reservoir» and was initiated on June 2001, but it aimed at only dredging of sediment of about 250,000 m³ deposited at and around inlet channel and portal portions of the intake structure so as to keep the proper functions of the intake structure for about 5 years. This was mainly due to the consideration that less effect on trapping fine sediments by check dams and high operation and maintenance cost of a dredger. This grant aid project was completed in February 2004 emphasizing the urgent necessity to formulate a master plan on countermeasures for sedimentation problems of the Wonogiri reservoir including its watershed conservation plan.

However, it was just an urgent measure to prevent the intake from clogging by the sediment deposit. In order to recover the storage capacity of the reservoir, fundamental permanent countermeasures should be established and implemented. Under such condition, the GOI officially requested the GOJ to provide the technical assistance to formulate a master plan as a continuation of the grant aid project in August 2002. In response to the request, the GOJ decided to conduct the Study on Countermeasures for Sedimentation in the Wonogiri Multipurpose Reservoir.

IV. CURRENT STATUS OF WONOGIRI RESERVOIR OPERATION

Mean annual inflow volume into the Wonogiri reservoir was approximately 1.23 km³ in 1983-2005, and mean annual water release from spillway (spill-out) was around 18% of the total outflow volume or 0.21 km³. The remaining volume (82% or 0.932 km³) was used for hydropower generation. Mean monthly inflow is abundant in the monsoon rainy season, where it equals to 110.8 m³/s (0.268 km³/month) and is the highest in February, in contrary to the dry season, where in August – as an example – it becomes to the lowest of 2.3 m³/s (0.006 km³/month).

For flood control, the reservoir water level is controlled not to exceed the High Water Level (elevation 135.3 m) during the flood season for eliminating the possibility of overtopping of a having a probable maximum flood (PMF) surge over the dam crest. The reservoir provides 0.22 km³ of flood control capacity to regulate the standard highest flood discharge with peak discharge of 4,000 m³/s to the constant outflow of 400 m³/s.

Immediately after completion of the Wonogiri Irrigation Project in 1986, the water supply to the Wonogiri irrigation system was commenced. Irrigation water is taken from the reservoir to Colo Weir, located about 13 km downstream of the Wonogiri Reservoir. At present, the irrigation area has been extended from 24,000 ha in the original plan to 29,330 ha where triple or double cropping farming is being practiced. Mean monthly discharges at the Colo Weir in 1986-2005 are ranging from 22 to 30 m³/s in the dry season.

V. CURRENT STATUS OF WONOGIRI RESERVOIR SEDIMENTATION

1. Sedimentation Condition in the Reservoir

The sedimentation issues and problems of the Wonogiri reservoir are: (i) sediment deposits and garbage at the intake structure; (ii) decrease of effective storage volume due to high sediment yields in Wonogiri dam watershed, and (iii) risky reservoir operation against PMF due to decrease of effective storage volume. A bird-eye view of the sedimentation condition of the reservoir could be seen in Figure 1.



Figure 1 View of the Wonogiri Dam Reservoir during Normal High Water Level – 136 m (above) and Low Water Level - 127 m (below)

An echo sounding survey with global-positioning system (GPS) for the Wonogiri reservoir was conducted over the two periods from October to November 2004 (before entering the wet season) and June to July 2005 (after the wet season) to clarify current status of the sedimentation as well as incremental sediment deposit in the wet season in 2004/2005. From the survey results, the current status of the Wonogiri reservoir is assessed as follows (see Table 2 for details):

1. There is almost no change in the flood control storage zone between elevation 135.3 m and 138.3 m. This is because of the sediment inflow occurs during the wet season and the deposition occurs dominantly in the range of the storage zone between low water level or LWL (elev. 127.0 m) and normal high water level or NHWL (elev. 136.0 m).
2. Therefore, no sediment deposits in the flood control storage zone above NHWL hardly occur, while the visible bank failures/erosions readily occur around the fringe of reservoir area due to wave actions in the reservoir. These reveal that the safety of the Wonogiri dam against a PMF is secured even under the current severe sedimentation condition.
3. In the sediment storage zone below elev. 127.0 m, a volume of 56 million m³ in total or 49.1% of the original storage capacity has been lost due to sedimentation in 1980-2005.
4. The volume of the effective storage zone between elev. 127.0 m and 136.0 m has been reduced from 433 to 375 million m³. The volume lost is 58 million m³ or equivalent to 13.4% of the original storage capacity due to sedimentation between 1980 and 2005.

5. Approximately 16% of the original gross storage capacity (= 730 million m³) below DFWL (elev. 138.3 m) was lost due to sedimentation between 1980 and 2005. The average annual rate of reservoir capacity loss is therefore around 0.64%/year (= 16%/25 years).

Table 1 Loss of capacity of the Wonogiri Reservoir by storage zone between 1980 and 2005

Reservoir Zone	Reservoir Capacity (million m ³)		Capacity Lost Due to Sedimentation	
	1980	2005	Value (million m ³)	From Original (%)
Flood Control Storage (El. 135.3 – 138.3 m)	232	230	2.0	0.9
Effective Storage (El. 127.0 – 136.0 m)	433	375	58	13.4
Dead Storage (below El. 127.0 m)	114	58	56	49.1

2. Erosion Sources and Sediment Yields from Wonogiri Watershed

Erosion sources of the sediment deposits in the Wonogiri reservoir were identified according to the visible erosion sites in the Wonogiri catchment: i) soil erosion of land surface, ii) gully erosion, iii) landslide (slope failure), iv) river bank erosion, and v) slope erosion of road side. Field investigation and GIS analysis were performed to estimate annual sediment yields from respective erosion sources. Average annual sediment yield into the Wonogiri reservoir in 1993-2004 is 3.18 million m³. Tabulation of the erosion sources is as Table 2. Dominant erosion source is the soil erosion from land surface. Its volume is 93% of the total, while sediment yields from other sources is only 7%.

Table 2 Annual sediment yield into the Wonogiri Reservoir by source and river (m³)

River System	Gully Erosion	Landslide	River Bank	Roadside Slope	Surface Soil Erosion	Total
Keduang	67,880	2,930	9,780	3,690	1,134,300	1,218,580
Tirtomoyo	90	11,730	19,760	2,480	469,700	503,760
Temon	30	0	11,350	600	61,000	72,980
Solo	220	440	11,040	1,990	591,300	604,990
Alang	7,330	0	66,620	730	326,600	401,280
Others	0	0	11,850	1,170	363,900	376,920
Total	75,550	15,100	130,400	10,660	2,946,800	3,178,510

VI. PROPOSED MEASURES TO COPE WITH THE SEDIMENTATION ISSUES

1. Structural Measures Alternatives

The following structural measures are proposed considering the sediment inflow characteristics of the tributaries: i) Measures to cope with the sediment and garbage inflow from the Keduang River as well as the sediment deposits at/around the intake structure as the urgent measure, and ii) Measures to cope with the sediment inflow from other tributaries as the mid-term and long-term measures. Figure 2 presents conceivable structural alternatives of respective measures and Figure 3 illustrates the concept of these alternatives.

2. Proposed Watershed Conservation Projects

The proposed basic conservation measures consisting of soil & water conservation measures and agricultural promotion measures for the targeted subject areas of upland field, settlement areas under upland field condition and settlement areas have been formulated for individual land units being classified by slope classes and current terrace type. The measures are briefly discussed in the followings.

Upland Field with Benched Terrace

Soil and water conservation measures envisaged in the upland field with benched terraces are defined as “Terrace improvement works” and include improvement of terrace structures of terrace bench, lip, riser, waterway and drop structure at different degrees depending on current terrace type and condition. Further, the works include vegetative measures of vegetating of terrace lip and riser with grass or shrub for their stabilization.

The agricultural measures are formulated as land management and agricultural promotion concepts: (i) land management for soil and water conservation; (ii) agro-forestry promotion; (iii) improvement of settlement area use; (iv) crop sub-sector measures and (v) livestock sub-sector measures.

Agro-forestry is considered as a soil and water conservation and agricultural promotion measure which is envisaged to be introduced in the entire farm land for increase of farm income and for mitigating farm labor shortage problem slated in the near future in the watershed area. The intensity of the introduction of agro-forestry is determined depending on slope class as set in the basic directions.

Upland Field without Bench Terrace, Traditional Terrace and Settlement Area under Upland Field Condition

The conservation measures proposed in upland field without bench terrace, traditional terrace and settlement area under upland field condition are similar to those proposed for upland field with bench terrace and defined as «terrace formation/upgrading works» and consist of physical measures and vegetative measures. Proposed agro-forestry development and land management and agricultural promotion measures in the subject areas are same as those proposed for upland field with bench terrace.

Settlement Area (Housing Yard)

Measure proposed to mitigate soil erosion in housing yards is to establish hedge rows at fringe of the yards and to construct side ditches along housing yard.

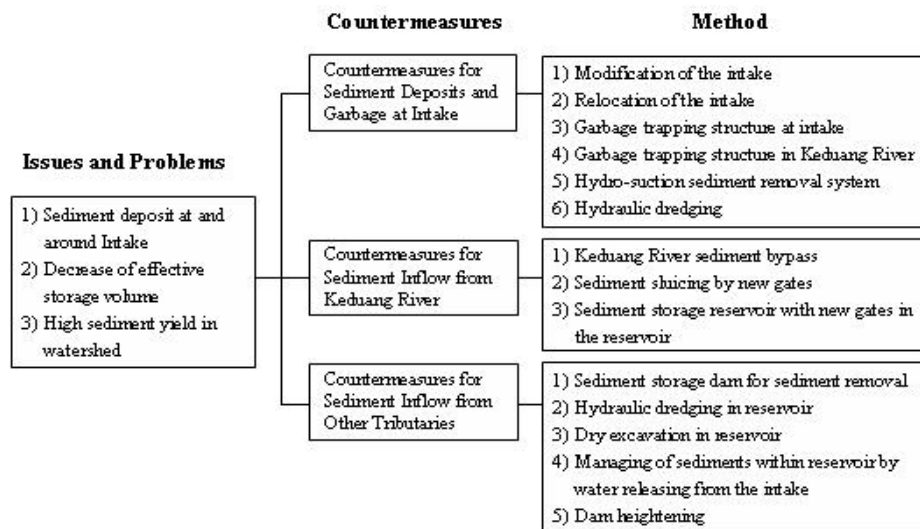


Figure 2 Conceivable structural alternatives for Wonogiri Reservoir sedimentation issues

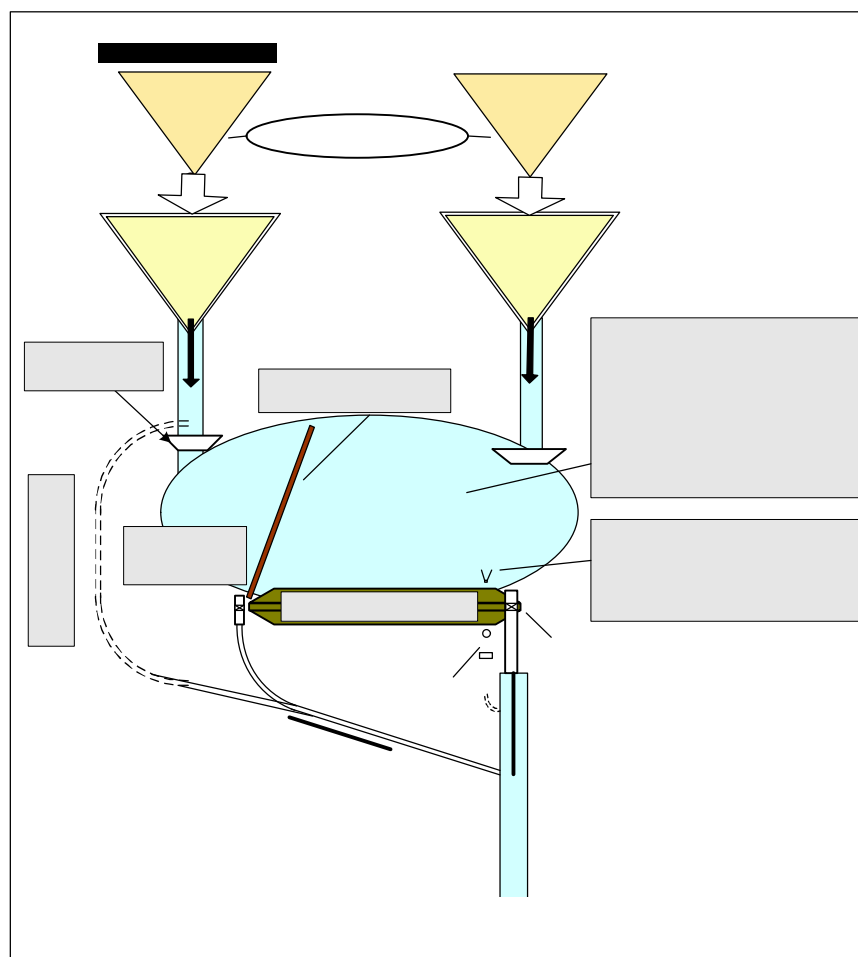


Figure 3 Concept of conceivable structural countermeasures on tributaries

In brief, the following Table 3, Table 4 and Table 5 as quoted from the GOI study (2007), will show summary of the evaluation results made on the alternatives.

Table 3 Evaluation results of alternatives for sediment deposits and garbage at the reservoir intake (GOI, 2007)

Alternative	Technical Applicability	Environmental and Social Impacts
1) Modification of intake	Not sustainable solution because sedimentation will continue year by year over the inlet elevation at the intake.	Irrigation water supply and power generation shall be suspended due to temporary stoppage of the intake during construction.
2) Relocation of intake	Sedimentation will occur at the new intake, although sedimentation rate is small compare to that at the existing intake. Periodic dredging at the new intake would be required in the future.	Irrigation water supply and power generation shall be suspended due to the connection work with the existing intake. Large disposal area will be necessary.
3) Garbage trapping structure at intake	Blocking of the intake will be solved by periodical garbage removal. Sediment deposits at the intake shall be solved by other structural measures.	Water supply shall be suspended due to temporary stoppage of the intake during construction.
4) Garbage trapping structure in the Keduang River	Periodical removal of the trapped garbage will be required. Sediment inflow flow Keduang River continues to enter into the reservoir without being trapped.	Positive impact will occur. Degradation of water quality in the reservoir will be mitigated owing to trapping of garbage from the Keduang River.
5) Dredging by hydro-suction method	There are operational constraints depending on the reservoir water level because of necessity of water head difference.	Possible negative impact on water quality of downstream Bengawan Solo River due to release of dredged sediment.
6) Hydraulic dredging	Most common measures for removing sediment deposits in reservoir. Huge spoil bank areas are required.	Relatively less impact because of lots of worldwide experiences provided with spoil bank areas.

Table 4 Evaluation results of alternatives for sediment inflow from Keduang River (GOI, 2007)

Alternative	Technical Applicability	Environmental and Social Impacts
1) Keduang River sediment bypass	Technically applicable. But due to small discharge capacity of bypass tunnel (50 m ³ /sec) flood inflow from the Keduang River with high sediment concentration cannot be fully diverted. Considerable volume of sediment flow as well as garbage from the Keduang River enters the Wonogiri reservoir. Modification of intake or periodic dredging at the intake will be indispensable in view of sustainable operation of the reservoir. Huge construction cost will be required.	Serious negative impacts with larger magnitude will occur. Huge disposal areas of excavated materials (around 270,000 m ³) spawned by tunneling are necessary. It might be very difficult to secure spoil bank areas near the dam area. Impacts during construction works include topographic and geologic changes, waste of excavated materials, drawdown of groundwater level and inconvenience of well water use, air quality, noise, unrest of local people, some conflicts/opposition from local people, etc.
2) Sediment sluicing by new gates	Technically applicable. Sluicing operation will be applicable at the beginning of wet season only when the water level is the lowest. If the gates are fully opened, considerable amount of garbage would be released to the downstream reach. However, release flow from the gates shall be controlled not to exceed 400 m ³ /s according to the current reservoir operation rule. There is a risk that the reservoir water level cannot reach NHWL at the end of wet season when much water is used for sluicing. More than half of the sediment inflow from the Keduang River will be deposited in the	Highly turbid water from the Keduang River will be released. The released turbid water might cause negative impacts on aquatic organisms, especially fish. At the worse, high concentration of SS might cause a respiratory impediment of fishes. Huge disposal areas of excavated materials (around 800,000 m ³) are necessary. It might be very difficult to secure spoil bank areas near the dam area. Impacts during construction works include topographic and geologic changes, waste of excavated materials, air quality and noise, etc.

Alternative	Technical Applicability	Environmental and Social Impacts
	reservoir. Periodic maintenance dredging at the intake is necessary.	
3) Sediment storage reservoir with new gates in the reservoir	Technically applicable. Sediment sluicing (sediment routing) and flushing contemplates to effectively utilize the water power (sediment transport capacity) of a natural river with less running cost. As the sediment storage reservoir can be operated independently from the Wonogiri main reservoir, the current operation rule can be applied for sediment releasing operation. After the reservoir water level reaches NHWL, sediment releasing operation will be started without using the stored water in the main reservoir.	Highly turbid water from the Keduang River will be released through the new gates. The released turbid water might cause negative impacts on aquatic organisms, especially fish. At the worse, high concentration of SS might cause a respiratory impediment of fishes. Huge disposal areas of excavated materials (around 800,000 m ³) are necessary. It might be very difficult to secure spoil bank areas near the dam area. Impacts during construction works include topographic and geologic changes, waste of excavated materials, air quality and noise, etc.

Table 5 Evaluation results of alternatives for sediment inflow from other tributaries (GOI, 2007)

Alternative	Technical Applicability	Environmental and Social Impacts
1) Sediment storage dam for sediment removal	Technically applicable but not sustainable solution in view of practicability. Around 83 units of storage dam would be necessary for trapping the annual sediment deposition volume of 2.0 million m ³ from other tributaries. Continuous sediment removal works for 2.0 million m ³ will be necessary every year. It would not be practical and applicable.	Huge disposal areas are necessary for periodic sediment removal works. It would be impossible to secure annually spoil bank areas for spoiling 2.0 million m ³ of sediments near the reservoir.
2) Hydraulic dredging in reservoir	Technically applicable but not sustainable solution in view of practicability. 10 dredgers would be necessary to dispose the annual sediment deposition volume of 2.0 million m ³ . Huge running cost and spoil bank areas are required. It will not be practical and applicable.	Huge disposal areas are necessary for dredging works. It would be impossible to secure annually spoil bank areas for disposing 2.0 million m ³ of dredged sediments near the reservoir.
3) Dry excavation in reservoir	In view of sustainable and economical measure, dry excavation deems not applicable. So many equipments such as bulldozers, crawler loaders and dump trucks would be necessary to excavate the annual sediment deposition volume of 2.0 million m ³ . Huge running cost and spoil bank areas are required.	Huge disposal areas are necessary for periodic sediment removal works. It would be impossible to secure annually spoil bank areas for spoiling 2.0 million m ³ of sediments near the reservoir. Possible impacts on air quality, noise and transportation during the excavation works.
4) Managing of sediment within the reservoir by water releasing from the intake	By use of the maximum intake discharge (70 m ³ /s) for power generation, previously deposited sediments are moved toward the dead zone of the reservoir, thereby maintaining or increasing the effective capacity of the reservoir. However, reliability of this method will be considered to be low, because of likely blocking of the intake due to garbage.	Significant amount of water must be released through power generation, and there is a risk that the reservoir water level cannot reach NHWL. This might cause water deficit for irrigation in downstream area and impacts on paddy fields in case of inappropriate water release. It might spawn people's unrest or conflict.
5) Dam heightening	This method is to raise the dam crest to secure the effective storage capacity. Dam heightening would be the option to adopt in the	This measure might cause social controversy because it would require large area of land acquisition and possibly resettlement. Not only

Alternative	Technical Applicability	Environmental and Social Impacts
	future when the storage capacity of the reservoir decreased substantially. The Steering Committee on August 22, 2005 concluded dam heightening not recommendable.	the social controversy, but also a large scale of civil work would be needed, which may cause serious negative impacts on the local residents.

3. Reduction of Soil Loss Production

The project works for watershed conservation project consist of; (i) terrace improvement works; (ii) terrace formation/upgrading works; (iii) agro-forestry development works; (iv) farming support programs; (v) hedge row works; (vi) side ditch construction works; and (vii) other support programs for land management and agricultural promotion. Reduction of soil loss in the Wonogiri watershed is expected after implementation of the watershed conservation projects. The water conservation projects will be carried out about 34,400 ha of the target subject area.

4. Support Program for Promoting Watershed Conservation Projects

The primary practitioners and beneficiaries of the proposed watershed conservation are dry land farmers in the watershed area. For strengthening support for those farmers in executing the watershed conservation, technical and financial support programs for the implementation of watershed conservation have been formulated in the present study. Reflecting the proposed watershed conservation, the proposed programs are formulated being directed to soil & water conservation and land management & agricultural promotion measures. The program components are briefly summarized as follows:

Support Programs for Soil and Water Conservation Project

The proposed soil and water conservation measures are approaches having direct and immediate effect on soil conservation and support programs for practitioner farmers should be accommodated as components of development works to ensure such direct and immediate effects of the measures. The proposed support programs include: (i) empowerment of beneficiary farmers and farmer groups, and (ii) support programs for operation/implementation of conservation measures. In addition, the empowerment of field staffs providing technical guidance and support to farmers and farmer groups is an essential initial and periodical step to be taken for the efficient and successful implementation of the measures.

Table 6 Contents of support programs for soil and water conservation project (GOI, 2007)

Farmers & Farmer Groups Empowerment Package Program	
Programs	Activities
1. Farmer group formation program	Farmer group formation (mass guidance, socialization, workshop and support for formation)
2. Farmer group empowerment program	<ul style="list-style-type: none"> – Key farmers training – Demonstration activities operated by Key Farmer – Mass guidance on conservation measures to all members of farmer groups (farmer field day at demonstration site) – Need inventory of individual farmers for grasses, tree crops & trees to be introduced in the proposed measures
Package Program for Operation/Implementation of Conservation Measures	
Programs	Activities
1. Terrace formation guidance program	<ul style="list-style-type: none"> – Technical guidance on proposed soil & water conservation measures – Provision of grasses/trees for terrace stabilization – Labor cost subsidy for physical measures (terrace improvement, formation or upgrading works)
2. Agro-forestry development program	<ul style="list-style-type: none"> – Technical guidance on agro-forestry development – Provision of support package (seedlings & farm inputs) for agro-forestry development envisaged in the proposed measures

3. Farming support program	<ul style="list-style-type: none"> – Technical guidance on farming system improvement – Provision of soil ameliorant and farm inputs
4. Field guidance program	<ul style="list-style-type: none"> – Inception technical guidance & support to beneficiary farmers & farmer groups – Follow-up technical guidance & support
Other Supporting Program	
Program	Activities
1. Field staff empowerment program	Introduction and periodical refresher training and technical guidance for field staffs

Support Programs for Land Management and Agricultural Promotion

The support programs are formulated aiming at strengthening of extension activities for land management & agricultural promotion and consist of: i) technology development program, ii) demonstration program, iii) establishment of pilot demonstration field of tree crops & trees, iv) farmer & farmer group training program, v) vegetable and legume (in Javanese: palawija) seed production program, vi) livestock promotion program, and vii) strengthening of logistic support for extension activities.

Support Programs for Community Development

The support programs are formulated aiming at empowerment of village people and organization. The support programs consist of various supports for: i) village assessment based on the PRA, ii) formulation of draft village action plan, iii) establishment of implementation committee, iv) guidance and support of village grant fund, and v) education program on watershed conservation.

Monitoring and Evaluation at Village Level

The monitoring and evaluation (M&E) at village level are formulated aiming at empowerment of village people and organization for feedback and project modification. The M&E works as empowerment approach should include: i) supervision of the works by the village, ii) project impact analysis by the village, iii) necessity modification of project based on the project evaluation, and iv) knowledge building based on lesson and learn from the project.

VII. PROPOSED PROJECTS TO INCREASE WATER AVAILABILITY IN LOWER SOLO RIVER BASIN

In the Lower Solo River basin, if there is no input of water storage structure, water deficit will occur for the domestic and industrial water uses in the near future. Therefore, Lower Solo Long-channel Storage Project is considered to mainly provide the domestic and industrial water supply.

The Long-channel Storage Project aims at supplying the domestic and industrial water in the Lower Solo River basin and the north coastal area. The north coastal area covers Regencies of Tuban, Lamongan and Rembang, and seriously lack water resources as the highly upper watershed has many small rivers. These areas severely dry up and no reliable water sources are available. However, these areas have been targeted for industrial and associated sector developments to take advantage of favorable seaport facility locations for shipping and roads for inland transportation. These developments will require considerable water volumes for industrial processing and public uses. The extremely limited water resources in these areas will be countered by transferring water from the Lower Solo River by means of a pipeline and/or the existing floodway associated with the Jabung retarding basin.

Storage structures of the Lower Solo Long-channel Storage Project consist of three barrages and one dam, which are Sembayat, Babat and Bojonegoro Barrages and Alt. Jipang dam. Out of the four proposed structures the Babat Barrage is

now completed by the Lower Solo River Improvement Project, Phase I.

Table 7 Additional water supply facilities in the lower Bengawan Solo

Scheme	Barrage/Dam	Capacity (million m ³)
Lower Solo mainstream	Sembayat Barrage	40.6
	Babat Barrage	25.3
	Bojonegoro Barrage	21.0
	Alternative of Jipang Dam	50.0
Total		136.9

VIII. QUESTIONS FOR DISCUSSION

1. What are your country's strategies to adapt and deal with the effects (viz. droughts, flooding) of climate change on water resources?
2. Do you have reservoir sedimentation problems in your respective basin? If yes, how do you manage it and what is the result?
3. What is the role of the existing RBO in the affected basin or who are the parties addressing challenges on water allocation and sedimentation?
4. In case of water scarcity occurs in your basin, how do you allocate water to the users?

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THE THIRD GENERAL MEETING OF NARBO

INTRODUCTION TO THE STUDY VISIT PROGRAM

(February 20, 2007)

BEST PRACTICES ON PUBLIC PARTICIPATION AND BOTTOM-UP APPROACHES IN WATER RESOURCES PLANNING

I. OBJECTIVES OF THE STUDY VISIT

This handout serves as an introduction to the study visit program which is an integrated part of the Third General Meeting of the Network of Asian River Basin Organizations (NARBO). This introduction is aimed to provide participants with background on the public participation and bottom-up approaches in water resources planning as been applied in the Bengawan Solo River Basin. Even though this study will visit the Gemawang Village, at the Nguntoronadi District in the Wonogiri Regency, it is foreseen that issues of this study visit is at catchment area scale of the Wonogiri Reservoir.

Objectives of this study visit are as follows:

1. Sharing the present practice of public participation and bottom-up approaches in water resources planning in a typical river basin of a NARBO members' country.
2. Foster learning process on challenges, solutions and lessons learned in public participation and bottom-up approaches in water resources planning.

Study visit will be arranged as follows:

<u>Time</u>	<u>Schedule</u>	<u>Remarks</u>
07.45-08.00	Preparation for departure	
08.00-09.00	Travel to Wonogiri	By bus and coach
09.00-10.00	Meeting with the Wonogiri Regency Administration	
10.00-10.45	Travel to Gemawang Village	By bus and coach
10.45-12.00	Site visit at Gemawang & dialogue with stakeholders involved in the PCM process	Dialogue will be held at the village office
12.00-12.30	Lunch break	
12.30-14.00	Continue dialogue with stakeholders	
14.00-15.00	Travel back to the hotel	

II. PUBLIC PARTICIPATION

1. Public Participation: a Framework to Decision Making

Like environmental planning in general, Integrated Water Resources Management (IWRM) is usually characterized by the involvement of numerous decision-makers operating at different levels and the large number of stakeholders with conflicting preferences and different value judgments (Lahdelma et al., 2000). This makes the development of policy implementation strategies and decision making in the context of IWRM a very complex issue, also because it requires a broader integration with other sectors such as environment, energy, industry, agriculture, tourism.

In a decision making process, it is possible to identify people, groups or institutions that can play a meaningful role in the final decision. In general, Feás (2004) classify these main actors as decision makers, people and groups affected, and analysts. But normally in the real life, not all of these actors are always involved in the decision making process. The decision maker is situated in the centre of the decision making process and is the one who has the institutional power and responsibility to select and implement a solution for a specific problem. People affected are all those whom will be influenced by the consequences of the solution adopted and implemented by the decision maker. The analyst is the person/group that helps and guides the decision maker to analyse and represent their preference structures and those from other interested groups.

One of the main issues in the field of environmental decision making is the need, sometimes the obligation imposed by the legislation, to communicate the decision process and make it more comprehensible and transparent. For the reasons described above, there is no doubt that public participation has become a major issue in IWRM. In order to facilitate the active involvement of all the stakeholders in water decision problems there is a challenge that has to be faced: the integration of scientific knowledge and public participation. This is not an easy task.

Facing water problems, decision makers find public participation important for various reasons, first of all because it is required by legislation. Moreover, decision makers are responsible of the selected decision and also its acceptance, for which public participation is essential. Nevertheless, major problems in IWRM like the lack of available information, the uncertainty about future effects or the incomplete knowledge of experts, create more difficulties on obtaining these goals. Decision makers have in general, little experience in sustainable water management. Because of this inexperience and the uncertainty inherent to these decision problems, public preferences need to be included in a more direct way by sharing part of the responsibility and trying to find compromise solutions that facilitate acceptance.

Once the crucial importance of the public participation in the decision making process in IWRM has been recognized, the next step must be to clarify the way public participation, decision making and science knowledge can be integrated.

For this integration, all the meaningful information has to be collected, structured and presented in an understandable way to help decision makers to integrate all the actors involved in the decision making process and all the scientific knowledge available. Several decision support systems have been developed in the last years to satisfy this need, for specific water resource planning activities such as prevention of water shortages (drought), surpluses (floods) and water impairment (pollution).

In order to assess whether policies will be working and to fine-tune them in order to reach the ultimate objective, conceptual frameworks are needed. They facilitate the understanding and exchange of information between policy-makers, stakeholders and technical and scientific support. Public participation could be also involved in the identification of alternatives. But as political decision makers, they need an overall view of the problems. Frameworks that structure collections of indicators and that communicate their application are being developed, at different analytical levels.

A conceptual framework applied to water management could help to identify the decision level related with the specific

problem and the range of alternatives that could solve it. Conceptual framework allows to have a common understanding of the problem that is a basic step for an effective decision making process and the basis to propose.

In order to obtain the analysis matrix, decision makers have to reflect their value judgements and preferences by the public utility functions. As in the selection of the criteria, decision makers have the problem of lack of information about this point. That is why at this point public participation is needed. By public participation, asking directly all the actors involved in the decision process about their individual preferences, the general form of the public utility function for each criterion previously selected can be obtained.

Public participation is also needed in the selection of the aggregation procedure. Several aggregation methods are available and the analyst should help to select the most suitable method based on the preferences of the actors involved and, depending on the problem faced. Not all the problems are the same and each specific context requires a specific method.

The last point where public participation could play an important role in the decision process is in the assessing of weights to aggregate all the information. In this step, some conflict may arise because of the different interest of the actors involved in the process. Public participation could increase the acceptance of the final decisions, making clear the individual preferences and giving the basis for possible compromise solutions. Public participation could play an important role in the decision making process related to IWRM, where the environmental tools could be also helpful. There is not a consensus about the involvement of public in the decision process. Different levels of public participation have their advantages and disadvantages and they must be clearly established for each particular type of problem.

2. Application in the Bengawan Solo River Basin

When it works well, public participation has many benefits: it can allow for a democratization of decision-making through improved stakeholder inclusiveness, transparency and accountability. Appropriately implemented, it can empower people, particularly those lacking the social and political clout and financial means to have a voice and take part in decisions that define their livelihood opportunities. It can also encourage the integration of traditional knowledge and practices with innovative technologies and science to promote fair and efficient management of water resources and services.

The principle of public participation has acquired increasing prominence in a variety of development activities, as also in the management of river basins, which is to a certain extent, a decentralization issue. Although river basin decentralization is expected to benefit the people residing and operating within the ecological area, case studies point to mixed results. For example, greater efficiency with respect to storage capacity and power production can result where decentralization allows upstream and downstream hydropower producers to negotiate the quantity of flow of water in the river. On the other hand, since all issues of allocation cannot be resolved through negotiation alone, as with high priority user rights among competing users of river water, the intervention of higher level of authority might be necessary, and a decentralized river basin is not effective. Successful decentralization depends on negotiated voluntary arrangements, conflict resolution mechanisms, and the institutions necessary to support them.

In Indonesia, public participation in the water resources sector has been given attention under the institutional and structural reforms at national, provincial and regency/municipal levels. In this connection, bottom-up approaches to planning are being very actively promoted. Public consultation is a mandatory requirement for incorporating the various demands and needs of communities and stakeholders (user groups) into the process of official development planning. The consultation process is therefore of great importance. Law of The Republic of Indonesia No. 7 of 2004 regarding Article 34 Paragraph (4) stipulates that the implementation of water resources development shall be carried out through public consultations, through stages of survey, investigation, planning, and based on technical feasibility, environmental and economic considerations. In addition, Article 84 Paragraph (1) stipulates the community members shall have equal opportunities to take a role in the process of planning, implementation and supervision of water resources management.

The bottom-up approach is aimed at empowering the community in project identification and implementation. The approach is being implemented nation-wide for water resources development and management projects at both study and implementation stages. Coordination of a basin-wide public consultation process for water resources planning has been an important learning experience for the Bengawan Solo River Basin Development Project (previously the PIPWS Bengawan Solo, and currently Balai Besar Wilayah Sungai or BBWS Bengawan Solo).

The bottom-up approach assumes a greater focus on public consultation and stakeholder participation (representatives of various water users such as farmer's groups, local governments, non-local governments (NGOs), universities, etc.) in formulating new water resources development policies and strategies. This bottom-up or participatory approach is expected to lead to more sustainable and equitable water resources development and management.

The importance of participation and bottom-up approaches and the critical role of local community initiatives for resolving water challenges have been demonstrated by Ministry of Public Works, Government of Indonesia. This introduction will provide information on:

- Public consultation meetings (PCMs) held under the Comprehensive Development and Management Plan (CDMP) Study for Bengawan Solo River Basin Under Lower Solo River Improvement Project completed in 2001.
- National partnership on water safe guarding or in Indonesian, Gerakan Nasional Kemitraan Penyelamatan Air (GNKPA) that was exercised in the upper Bengawan Solo River Basin as part of the civil society development in 2005-2006.

III. PUBLIC CONSULTATION MEETING UNDER THE CDMP STUDY (2001)

1. Objectives of the Public Consultation Meeting

Objectives the public consultation meetings under the CDMP Study were to:

- Get wide-range information about actual local problems, constraints, voices, opinions, needs, aspirations and proposals in water resources development and management through direct discussions with the local people (stakeholders),
- Gain understanding of the seriousness of such water stress situations and other water-related issues from local people,
- Identify the differing water management problems and individual development needs of each river sub-basin,
- Increase the local peoples' awareness of the objectives and activities of the CDMP Study,
- Familiarize Basin Water Resources Management Committee (or Panitia Tata Pengaturan Air abbreviated as PTPA) together with the local people with the new bottom-up approach through encouraging public involvement by means of public consultation meetings, and,
- Use the identified water management problems and development needs to formulate needs based water resources development and strategies for master planning.

The public consultation meetings (PCM) were held as follows at Surakarta on February 29, 2000 and March 11, 2000; Madiun on March 07, 2000, and Bojonegoro on March 02, 2000. The total involvement for PCM including Pre-PCM counted for as many as 534 persons from 20 regencies and municipalities.

2. Identified Issues through Public Consultation Meeting

Many valuable water resources development and management concerns have been raised by participants through the PCM. A number of comments and opinions were herein analyzed incorporating the results of «face-to-face» interviews, the questionnaire survey and field observations to identify many water resources development and management issues that are currently being experienced at the community level in the CDMP Study area. In conclusion, five key issues can be identified as schematically shown in Figure 1 below.

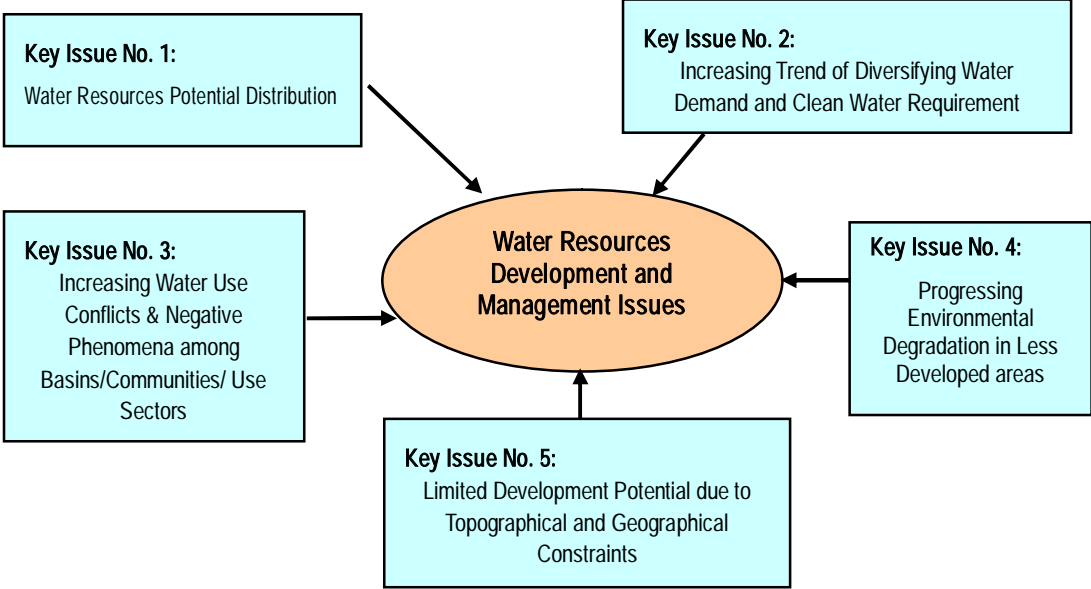


Figure 1 Schematic review on the key issues apprehended in the PCMs

3. Expected Requirements for Water Resources Development and Management from the Public Consultation Meeting

Based on major five key issues as addressed before, «key words» summarizing the expected requirements for comprehensive water resources development and management in the Bengawan Solo River basin is as follows.

Key word: Strong needs for water resources development in the Bengawan Solo River Basin, which can be understood as: (i) maximized efforts to develop any available water resources shall be needed; (ii) necessity to satisfy «variety sectors development requirements»; and (iii) the importance to make intensified efforts for «water use efficiency improvement».

In summary, basic requirements for formulating a comprehensive development and management master plan in the Bengawan Solo River basin are expected to comprise **five key requirements** as briefed below.

Requirement No. 1: development priority and principle under «equitable regional development» concept, whereas:

- «Equitable water resources development among basins and regencies» shall be taken into account to support «equitable regional development».
- Water resources development in «less developed» and/or «undeveloped» regencies/basins/communities shall be prioritized as far as expected water resources are available and/or accessible.
- As many improvement and/or rehabilitation activities as possible shall be needed for securing the «sustainable development benefits».

Requirement No. 2: necessity of watershed management at upland/water catchment areas, whereas:

- An integrated watershed management including socio-economic development in upland/catchment areas shall be

reinforced.

- Water resources development in upland/catchment areas shall be supported as much as possible by maximized mobilization of their resources potential.
- Introducing effective soil conservation and land rehabilitation practices in deteriorated watersheds shall be an urgent need to prevent irreversible and harmful changes to the stream flow regime (reduction in base flows and increase of flash flooding) and associated erosion and sedimentation.

Requirement No. 3: institutional scheme of water allocation rule and coordination management, whereas:

- «Coordination and management rules of water allocation» for various kinds of water uses including among basins/sub-basins/communities shall be reviewed.
- «Water use efficiency» among the existing beneficiaries/water use sectors shall be reviewed to guide more reasonable and equitable water allocation management.

Requirement No. 4: necessity of special supportive consideration for «development-barriers watersheds» coordination management, whereas:

- «Community development» by mobilizing the limited water resources through constructive allocation of water shall be considered to overcome various constraints for regional developments in watersheds with various topographic and geographic barriers.

Requirement No. 5: water allocation and management for various development sectors, whereas:

- «Coordination and management rules of water allocation» for various kinds of water uses including among basins/sub-basins/communities shall be reviewed.
- The increasing and diversifying water use requirements from «variety sector developments» other than the agricultural sector shall be considered under the «coordination and management rules of water allocation».
- Special attentions to «water quality monitoring and management» shall be considered in order to alleviate deterioration of river water quality.

The PCM, also envisaged the preferred sector development scenarios to the year 2025 and the goals and strategy for formulating master plan of water resources development and management in the CDMP Study area were totally conceived and agreed to by the stakeholders. Main points of comments and suggestions are summarized below.

- The CDMP Study proposed that implementation of the Jipang Multipurpose Dam would be ruled out from the development time frame to 2025 because of serious issues to the natural environment (the planned inundation area is 14,200 ha) and to the local communities (the required relocation was 13,760 families, or 65,500 persons in 1986).
- Full attention to socio-economic environmental issues shall be paid to minimizing the impacts on the natural environment and regional society that requires relocation of local inhabitants.
- Large-scale water resources development schemes already studied and/or planned (such as Bendo Multipurpose Dam Project, Badegan Multipurpose Dam Project, Solo Valleiwerken, Sembayat Barrage Project, long-channel storage scheme, etc.) shall be given high priority for development options.
- In view of equitable water resources development, development of small water storage reservoirs (embung, pond, swamp, etc.) in tributaries shall be promoted to overcome the water shortage in the dry season where the extremely limited water resources is a limiting factor for regional development.

- Some of the existing river and drainage structures, such as revetments and groundsills, have been damaged due to poor maintenance and require urgent repairs and rehabilitation.
- Although the present land use within the basin is almost saturated by over-dependence on paddy farming, there still strong needs for further paddy development.
- Increasing concerns at the existing irrigation systems are to improve the irrigation efficiency by overall management (more efficient in-field water use), and to promote system rehabilitation and upgrading.
- Environmental degradation in the watersheds has raised as a basin-wide concern requiring strict and effective watershed management focusing on the conservation and protection of land and water. A comprehensive approach for watershed management incorporating structural (re-greening, soil conservation, reforestation, vegetation, gully plugging, construction of retention dams, etc.) and non-structural (public involvement and participation, public awareness, promotion of environmental awareness, making inventory, etc.) elements shall be promoted with a main focus on the critical areas suffering from serious environmental deterioration and poor watershed management.
- Strengthening and reinforcement of the existing water quality management framework is becoming basin-wide concern from the public awareness that significant water quality deterioration is progressing within some parts in the Bengawan Solo River system, and that facilitation of more multi-sector approach to pollution control and water quality management is a key factor at both provincial and regional levels.
- Stakeholders' awareness on the bottom-up approach through encouraging public involvement is surely increasing and being familiarized. Their concerns and aspirations are addressing for improvement of public awareness (socialization), enforcement of laws and enhancement of community participation and local government involvement in various management on water quality, watershed, environment, water allocation, etc.
- Expansion of public water supply service areas in rural areas is strongly expected to improve social well-being within the CDMP Study area (Wonogiri, Boyolali, Ponorogo, Ngawi, Bojonegoro, Tuban, Rembang, Lamongan). Additional water allocation for diversifying water demands is also expected for industrializing and urbanizing areas.
- Groundwater exploitation will be still needed for irrigation development in the areas where the available water resources is extremely limited although substantial volumes of groundwater have been being exploited. Further a management framework for groundwater development is expected to control environmental impacts due to unrestricted groundwater exploitation (Surakarta, Boyolali, Ponorogo, Madiun, Blora, and Gresik).
- Some regency has perception that human resources development and human empowerment are a vital key factor for effective regional development as well as water resources development and management. (Surakarta, Bojonegoro, Lamongan).
- Under the on-going regional autonomy legislation, the Government's policy statement to establish an organizational and financial framework for self-financing and autonomous river basin management corporation is well aware to the stakeholders. Major twenty five (25) rivers in the Bengawan Solo River basin was included in the operational area of Jasa Tirta I Public Corporation by the Presidential Decree No. 129/2000. In this connection, the stakeholders expect that inter-regional and inter-sector coordination framework for more reasonable and equitable water management within the Bengawan Solo River basin becomes important with the involvement of institutional entities concerned and stakeholders (Surakarta, Bojonegoro).

IV. NATIONAL PARTNERSHIP ON WATER SAFE GUARDING

Civil society development is another part of the public participation that is important to deliver real bottom up aspirations and to maintain control of the public on the execution of the designated master plan. In water resources development, this command-control process of the public is necessary to be strengthened. In order to provide successful results in the planning process, the RBOs should take into account civil society involvement in decision-making process, to empower and resonate the voice of the people through various means.

In relatedness to the development of public participation, a civil society development plan with the aim to reduce erosion and sedimentation was initiated in the upper reaches of the Bengawan Solo River Basin, at the catchment area of the Wonogiri Reservoir. This includes the Gemawan Village, Nguntoronadi District, Wonogiri Regency, that will be visited.

This plan was executed under the national partnership on water safe guarding, in 2005. Civil society of villages in the designated area were involved in the planning process of to countermeasure erosion in the Wonogiri Reservoir catchment area. Method applied to involve public participation is the participatory rural assessment (PRA) technique.

1. Village Assessment

Goal of this activity is to identify the villages' condition, problems and resources associated with community's economic and social life and village's soil erosion, and prepare a village action plan on soil conservation. Output of the assessment is a detailed analysis on soil-conservation problems related the condition of the community.

Primary data found through participatory rural appraisal (PRA) techniques and village workshop in 24 villages (including the Gemawang Village). This primary data used to assess how heavy the existing problem affect the erosion, and how enough the potentials available are developable and sufficient to support those efforts. Selection the 24 survey villages was done together between the team and stakeholders through a day common workshop, by showing the representation of watershed, upper stream, middle and lower stream of each sub watershed, and their contribution of sediment into the Wonogiri Reservoir.

The secondary collected from formal publication from Local Government, Statistic Board, and result of some studies done before by other parties related with sedimentation in Wonogiri Reservoir issues

Selected techniques used in the participatory rural appraisal (PRA) comprises:

- Participatory mapping, to explore general condition of the surveyed villages, and distribution of erosion locations and to identify the existing conservational structure at village.
- Village history in relatedness to the forest condition and soil conservation activities in the past, to understand trend and changes of village, soil and water conservation relation to the community.
- Discussion to develop institutional relation diagram, to assess the multi-stakeholder's role correlated with erosion management and the conservational effort in the village.
- Field transects to identify the eroded location in the catchment area of the Wonogiri Reservoir. This is used to identify and assess the field eroded location directly from number, size, condition aspect and alternative solution selected by the community to overcome the erosion problems in the eroded location.
- Livelihood and gender role assessment, to identify the kind of business and works that existing in the villages and become the villager's livelihoods and their influences to the existing erosion and conservational efforts.
- Seasonal calendar assessment, to identify agriculture common practices and habits of villagers in relation to develop

an effective conservation method for solving soil and water problems in their lands.

- Matrix ranking is used to assess the level of priority from problems faced by the community and their selected solution. This technique also become as base to draft the village action plan on soil and water conservation.
- Informal interviews were conducted to clarify some fact findings that need to be consulted with the related stakeholders either in village or Government levels.
- Focussed group discussions (FGDs) were also used to explore some information for a typical topic deeply. It used either when PRA process and Village Workshop one. It used by presenting the topic and made the casual and effect analyses based on limited existing information.



Figure 2 Participatory rural assessment process in the designated villages

Analyses model used in this study is stratified qualitative model. In the first level, some fact finding in the village levels would be classified into problems, potentials and solution chosen by the community. The identified problems then ranked by three criteria: felt by common people, urgent to solve, and availability of self reliance to do. From this matrix, then drafted to the Village Action Plan on Soil Conservation. In the second level, some fact finding every village analyzed and correlated with the sub watershed context in which the villages are located. Then, in the third level, some problems and potential that met during the study brought into to the sedimentation countermeasure in the Wonogiri Multipurpose Dam and Solo Watershed. By this model of analyze, the problem of sedimentation could be considered sharply in their locus, and context with other factors that affect sedimentation.

2. Village Potentials

The catchment area of Wonogiri Reservoir is populated by low educated people. The older people (more than 55 years) are just being literate, or even illiterate. Meanwhile the productive age just have graduated from elementary education. People who graduated in college or higher education are less than 1%. At the Wonogiri Regency level, illiterate people are close to 123,656 of the population.

Village governance is led by the village chief and assisted by the village-representative-board. These institutions plays an important role in public services.

Farmers group are found in every village, even at the sub-village levels. Farming credit has supported development of these groups. Eventhough, the farmers group varies in their development degree. This condition affected by three important factors: (1) unclear job description within themselves; (2) low accountability of financial report to the group's members, and (3) no integrated planning that combine conservation and economic activities.

Two forest conservation groups is present in most of every village. Most of these groups were established under the national movement on land and forest conservation program (2005), and relies financially on the government fund.

Eventhough, there are also conservation groups that were established by the people and remain independent. In the Wonogiri Regency, there are two forest conservation groups that has received acknowledgment as sustainable community based forest management, such as in the Temon sub-watershed. Another 8 groups, are also keen in preparing themselves like in the Upper Solo sub-watershed and Wuryantoro sub-watershed.

3. Natural Resources

Water resources are available in every village, mostly groundwater and abstracted by open wells simply enough to serve the community. Some wells in certain villages serves water for domestic purposes at other villages. In contrary, 4 villages (Pracimantoro, Paranggupito, Giritontro and Eromoko) are depended on water supply from other village during the dry season that last April to October every year. The water managed by the community itself to fulfill the local need in traditional manner. There is bilateral initiative between Wonogiri Regency and Gunungkidul Regency to interchange the water supply through a memorandum of understanding.

State-owned forest in Wonogiri Regency is close to 16,000 hectares, meanwhile the community-owned is close 27,000 hectares. Both plays an important role in conserving water, soil and maintain the biodiversity. There is a present trend that state forest decreases, while the community-owned shows increasing results.

However, rill erosion is dominant in the Wonogiri Reservoir catchment area. This is caused by the high demand for sawn timber, which is close to 150,000 m³ annually, while supply of teak wood and mahogany wood of the remaining forest is close only to 36,000 m³ annually.

Micro business is developing in Wonogiri, based on agriculture product and managed in domestic scale with traditional manner. The kind of products sold are local traditional snacks, cassava, cashew nut, furniture, small restaurant, and transportation effort.

4. General Problem

The general problems faced by the villagers can be divided into three main parts, i.e: village peasant's economy, peasant's and village conservation's institution, and social and politic in the public services and social relationship. Based on the general problems noted by the community during the PRA, then effort chosen by the community are as following.

Economic Sector

- Job opportunities based on agriculture and conservation.
- Improve the local trading scheme enable to add the agriculture's product value in order to eliminate the gap with industrial product's price.
- Develop the domestic's economy micro-business that manageable and developable by the women in villages.

Institutional Sector

- Re-arrange the local peasant groups in supporting the land conservation in the upland area for a seasonal planting.
- Develop the conservation groups based on village forest that supporting income generating, land and water conservation.
- Improve the relationship pattern between Conservation Groups, Govern Field Officers, and NGO Activists in managing the erosion issues collaboratively.
- Assist the Local Groups in managing the erosion issues from planning until evaluating process and supporting resources to Community economic empowerment and Village's Land Conservancy.

Social and Politic Sectors

- Erosion issues needs to be highlighted into the village's development plan in annual or multi years planning system.
- Increase Village Government and Local Organization's capacity building in managing the erosion and conservation problems.
- Increase the community's commitment and sense of belongingness in maintaining and developing the conservation infrastructure and vegetation.

5. Erosion Problems

The community has been selecting some action to countermeasure erosion problems as follows:

Rill /Sheet Erosion

- Terracing in the community and state's forests.
- Improving small gully plugs and drop structure to manage the rill erosion that enlarge to gully erosion.
- Planting the teak, mahogany, acacia and multi purpose tree species (MPTs) to improve the land covering and soil structure to the erosion effects.
- Making the small water tandons on the sloppy land.
- Strengthening land terracing with grass that can be fed for livestock.

Bank Erosion

- Planting the bamboo, teak, mahogany in the community land adherent with rivers.
- Making road side protection, gully plugs and stream bank protection

Gully Erosion

- Making water drop structure, check dams and gully plugs.
- Improving the land coverage by vegetative manner.
- Making diverting channels.

Result of village assessment is stipulated in the village action plan on soil conservation and will be advocated to become one of village development document. General meeting held for discussing of watershed conservation implementation were conducted regularly in the Gemawang Village. Various institutions, either from the national and regency level gets involved in this activity. Community group for water and soil conservation **Tirta Martani** was established officially by the civil society of the Gemawang Village on March 3, 2007

V. QUESTIONS FOR DISCUSSION

1. Kindly share with us the practice of public participation and or civil society development based on the water resources issues within your respective countries. How is it conducted?
2. Are there legal and institutional instruments to conduct the public participation and or civil society development process in water resources?
3. Are public participation and bottom-up approaches on water resources development and management planning in your respective basin/country effective?

4. How do you expect to raise public participation on water resources management in your respective basin/country?

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Fahmi Hidayat & Raymond Valiant

Part B (Day2)

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3rd General Meeting of the Network of Asian River Basin Organizations (NARBO)
Workshop 1: Measuring the Performance of RBOs and River Basins

Background Paper

**Performance Benchmarking and Peer Review of River Basin Organizations:
Lessons Learned and Recommendations**

Prepared by

Arlene Inocencio (International Water Management Institute), Ian Makin (ADB), Wouter Lincklaen Arriens (ADB) and Dennis Von Custodio (ADB Consultant)

I. Introduction

Across the Asia-Pacific region and beyond, governments and civil society are recognizing the need to improve the management of water resources in river basins, which in many cases requires a doubling of investments flows for water infrastructure, and also significantly more work to improve water governance, including reforms in policies and legislation, and developing capacity in institutions. Among these two dimensions of investment, one in infrastructure and the other in institutional capacity, the latter has proved more challenging, and success there is seen as a key requirement in addressing the water management challenges of the 21st century.

ADB has taken a leading role in increasing water investments in the region through its Water Financing Program 2006-2010, which seeks to increase investments in rural, urban and river basin water projects, supported by water governance reforms and capacity development programs. ADB also offers a wide array of knowledge and awareness products, and regional cooperation services, including support for NARBO.

It is now increasingly recognized that capacity development in institutions should be based on good diagnostic assessments, with the organization concerned firmly in the drivers seat to determine strategic direction, with full ownership for implementing the changes involved to improve performance. To support this process, performance benchmarking is gaining popularity as a powerful and cost-effective tool. It can help to assess and improve the performance of key water organizations, such as national water apex bodies, water utilities, river basin organizations, regulatory bodies, and irrigation service providers.

River basin organizations (RBOs) are central to the implementation of IWRM in river basins, although in most cases today RBOs are not single-handedly in charge of that process. In today's world, water management has become everyone's business, including a multitude of government and nongovernment actors at various levels. RBOs can play various roles under different circumstances, and there is no doubt that they can make an important contribution to introducing IWRM in river basins. They are therefore a central element in the evolving institutional frameworks that define how water is managed in river basins around the region. The work of NARBO is to support RBOs in their work, and one of NARBO's priority activities has

been to design and pilot a performance benchmarking system for RBOs, supported by a peer review process.

ADB and the International Water Management Institute have jointly led NARBO's work to develop and pilot a performance benchmarking system for RBOs to (i) track performance progress; (ii) enable comparisons with the performance of other organizations; and (iii) improve the efficiency and effectiveness of their services.

Initial concepts of NARBO's performance benchmarking service for RBOs were developed in a workshop in Jatiluhur, Indonesia in October 2004, where RBO leaders identified six broad areas of performance and fifteen success factors for assessment of performance. From this consultation, a discussion note¹ was prepared to guide further development of the service. A second consultation with RBO leaders was held the following month in Batu-Malang, Indonesia in November 2004 to discuss and group performance indicators in five areas of a Balanced Score Card (BSC): (i) mission; (ii) stakeholders; (iii) internal processes; (iv) learning and growth; and (v) financial management. These five areas are shown in Figure 1, with details presented in Table 1. Eleven RBOs expressed interest to use the service, which was then launched at the 2nd Southeast Asia Water Forum in September 2005 in Bali, together with the demonstration of on-line service and web-based application.

A workshop and training to certify peer reviewers was held during the 2nd NARBO General Meeting in Jatiluhur, Indonesia in February 2006 to (i) undertake initial training in the use of the web-based benchmarking service; and (ii) initiate the pilot benchmarking and peer review process. Four RBOs were selected for the initial pilot, and peer reviews have since been completed for Jasa Tirta II (Citarum river basin), Indonesia (October 2006), Mahaweli Authority of Sri Lanka (December 2006), Laguna Lake Development Authority, Philippines (January 2007), and the Red River Basin, Viet Nam (May 2007). A further self assessment and peer review of the Balai Besar (a new RBO) for the Citarum river basin, Indonesia (including Jasa Tirta II) will be completed in February 2008.

Figure 1. The five dimensions of NARBO's Performance Benchmarking Service for RBOs.

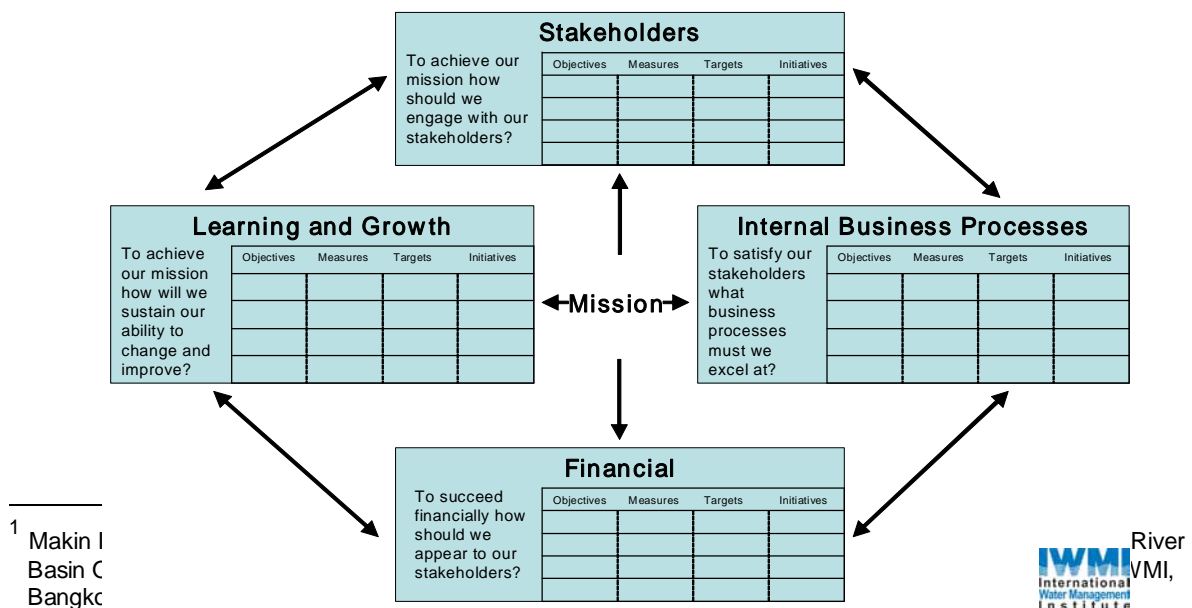


Table 1. RBO Performance Indicators in each of the five dimensions.

Indicator	Maximum Score	Remarks
MISSION		
RBO Status	4.0	A measure of the RBO development and extent of stakeholder involvement in, and quality of, the organization's decision making process.
RBO Governance	4.0	A measure of the national, regional, and organizational framework that support good governance.
STAKEHOLDERS		
Customer Involvement	4.0	A measure of the level of customer involvement in the decision making of RBO and, therefore, their acceptance of the organizational goals and operation.
Customer Feedback	4.0	A measure of the level of customer involvement in the decision making of RBO and, therefore, their acceptance of the organizational goals and operation.
Environmental Audits	4.0	A measure of the level of environmental awareness and intention to protect against environmental degradation.
Basin Livelihoods	4.0	A measure of the overall change in livelihoods in the basin
LEARNING AND GROWTH		
Human Resource Development	4.0	A measure of the maturity and effectiveness of HRD system within RBO reflecting its likely contribution to achievement of organizational objectives.
Technical Development	4.0	A measure of the level of commitment to adopt appropriate technology solutions that will aid in the delivery of the mission.
Organizational Development	4.0	A measure of the commitment to quality management through application of quality management system or similar management improvement tools.
INTERNAL BUSINESS PROCESS		
Planning Maturity	4.0	A measure of the level of planning operating within the RBO and its likely impact on delivery of mission.
Water Allocation	4.0	A measure of water resource allocations in the basin that determine delivery and performance of water services.
Data Sharing	4.0	A measure of the commitment to and implementation of effective data management and information dissemination.
FINANCE		
Cost Recovery	4.0	A measure of customer service and strength of budget management.
Financial Efficiency	4.0	A measure of the commitment to most efficient use of financial resources in pursuit of delivery of the mission.

II. Lessons Learned from the Pilots

With the completion of the four pilots, we can now draw some lessons to guide the future development and expansion of the NARBO performance benchmarking initiative.

The Benchmarking Tool

General

- From the four pilots, it appears that the benchmarking tool has real potential to be useful. The fact that the four pilot RBOs were able to use the indicators shows that the tool has a general applicability which transcends types or forms of RBOs.
- However it is clear that, for benchmarking to be truly useful, the RBO must have a clear vision of its purpose and a commitment to performance management. In general we believe that RBOs must align their organization with a clear integrated water resources management (IWRM) vision for the basin. A shared vision is a critical requirement for performance improvement.
- The pilot applications point to the need to link IWRM and benchmarking initiatives more closely within the NARBO. For instance, we found that the RBO personnel involved in IWRM are often not the same as those selected to be actively involved in benchmarking of the organization. This arrangement has advantages and disadvantages. One disadvantage however is that without a good understanding of IWRM, rating and setting of targets for IWRM goals becomes a more difficult exercise and can easily end up as superficial, losing credibility with those faced with achieving the targets. Where a clear vision does not exist then NARBO should perhaps consider facilitating retreats for key officials of RBOs tasked with leading their organizations to develop an IWRM vision to guide future operations before the benchmarking process is initiated.
- NARBO Benchmarking is based on a BSC framework which is intended to facilitate translation of the RBO strategy, and work towards the IWRM mission, into key performance areas (KPA). It is not clear for some RBOs how each KPA feeds into other areas and thereby leads to the achievement of the mission. For example, without sorting out the finance, RBOs will not be able to successfully operate and meet customer requirements. Also, key to the success of the BSC lies in selecting and measuring those processes that lead to improved outcomes for customers/stakeholders towards realization of the mission. Performance management depends on the organization recognizing the importance of having the “right” skills and the full alignment of the staff to achieve the IWRM goals. Financial resources will make possible investment in learning and growth of the human resources which should in turn lead to the improvement of internal business processes. This in turn will lead to better customer services and support.

Broad understanding and appreciation of the BSC approach by all staff and stakeholders may take time and will come with constant communication and more practice.

Specific

- There is a need to agree and adopt definitions for IWRM, balanced-scorecard, stakeholders, customers, register of assets, environmental audit (standard as opposed to a broader meaning adopted in the tool), etc.

The Benchmarking Process: the Self-Assessment and Peer Review

- The commitment and full support of the top executive and management of RBOs backed by providing some resources for implementation made possible the implementation of performance benchmarking. These are essential for any performance improvement strategy

– the organizations management must be committed to performance improvement if benchmarking is to be more than an exercise.

- Self-Assessment Selection of Team Chair. This is the critical factor in carrying out the performance assessment. It is vital that the team chair is a good, credible leader with a broad perspective and deep knowledge of the organization. The requirements of a chair given in the box below, makes choosing an appropriate RBO staff a key exercise.

Responsibilities of the Self-Assessment Chair:

- Steer the Self-Assessment Team in carrying out its tasks (scheduling and conducting of the organization-wide orientation, consultation and assessment);
- Take the lead in writing the Self-Assessment Report;
- Channel information between the self-assessment team and the peer review team once it will be formed;
- Take the lead in presenting the findings to the RBO top management; and
- Take the lead in presenting the results to the Peer Review Team

The appointment of RBO deputy heads to chair the self assessment teams during the pilot phase has worked well in terms of satisfying the above requirements and ensuring credibility and the necessary authority to carry out an elaborate/inclusive and information/data intensive process. If the SA Chair has a good understanding of IWRM and knows, or will learn, the BSC, performance benchmarking has a strong chance of succeeding and becoming a useful tool in the performance management tools available to the managers.

- Self-Assessment (SA) Terms of Reference (TOR). A clear understanding of the TOR is essential for the SA team. The more clearly defined are the TOR the more likely that useful findings will be obtained and the easier is the review process.

Terms of Reference of the Self-Assessment Team:

- a. Conduct an organization-wide orientation, consultation and assessment using the agreed benchmarking tool;
- b. Gather and put together all pertinent documents/materials to support the organization-wide performance rating;
- c. Document the whole self-assessment process, what worked and what did not work well, and recommend useful adjustments/changes in the tool;
- d. Write the Self-Assessment Report which will include both the success factors and constraints to an effective river basin governance in terms of the five **critical performance areas**: (i) mission; (ii) stakeholders; (iii) learning and growth; (iv) internal business processes; and (v) finance;
- e. Present the findings to top management/board;
- f. Present the findings to the appointed Peer Review Team; and
- g. Support the succeeding Peer Review Process which will validate the self-assessment results.

- SA Team Composition. As the SA team will examine a number of critical areas of operation, the composition of the team is important. It is desirable that the SA Team includes the head, or a senior deputy, of the units responsible for customer service, finance, human resources, technical and planning divisions/units are included in the team. Inclusion of field office

representatives also adds value by capturing a broader perspective of the organizations operations.

- Peer Review Process. The selection of the Peer Review team contributes to the success of the whole performance benchmarking. This aspect requires finding capable, “qualified” and willing RBO members who can be trained to become peer reviewers.

Expectations of Peer Reviewers. After certification, Peer Reviewers are expected to: (a) be available to conduct peer reviews, (b) visit other RBOs, (c) work with other peer reviewers, (d) review other RBO self-assessment reports, (e) interview the top management, staff and stakeholders of RBOs being reviewed, (f) hold dialogues with other RBO Self-Assessment teams, (g) write reports and present findings and recommendations to other RBO top managements, and (h) submit final peer review reports to the boards or top managements of RBOs reviewed.

Qualifications of Peer Reviewers. Given the above expectations, peer reviewers are to undergo training and certification and only those who meet the following criteria and are highly recommended by their RBO heads are considered and certified:

- hold a senior management position, i.e., make or influence decisions, possess a high degree of technical and administrative skills, knowledgeable of the activities and operations of the RBO including client needs, and able to contribute and foster knowledge-sharing during deliberations of the peer review team, and able to develop critical evaluations and strategies as necessary.
- have extensive experience in river basin work, i.e., with several years of river basin planning and management experience, substantial knowledge of the water resources challenges and needs of the river basin, and able to apply technical skills to advise and support, and to develop critical analysis and strategies.

This is a current limitation in that there are only a few certified peer reviewers who can carry out peer reviews. Clearly, there is a need for NARBO to train and certify more peer reviewers, however there needs to be a balance between developing the experience of the existing certified reviewers and expanding the pool of reviewers.

- The peer review requires the PR team to review and assess a considerable volume of information in a short time and, therefore, reviewers must have a good understanding of the contextual setting of the RBO being reviewed to be able to provide a sound peer review. Without an adequate understanding of the context and the complex issues of adopting and implementing IWRM, it is possible to arrive at a superficial evaluation. The existing reviewers consider that a realistic time for a review is about 6-7 days rather than the 3-4 days in the pilot phase. The peer review team should also include specialists representing each of the four critical performance areas.
- Language differences posed a significant constraint during the pilot phase. Many important reports/documents presented as evidence to support ratings are not in English. This is contributing to the difficulty in carrying out peer reviews. There should be provisions for translation of key documents and use of professional translators during stakeholder consultations.

The Benchmarking Results

- Report Formats. For Self-Assessment (SA) Reports, both the detailed text and bullet type table formats are useful. The table and bullet/outline form works well for the RBO being reviewed but is more difficult to follow for the peer review team that has to become familiar

with the RBO. The extensive and detailed write up is very useful to the PR team, such as the example by Laguna Lake Development Authority (LLDA) can be used as a sample for others to follow. The table form, such as the example SA Report of Jasa Tirta Public Corporation II, is useful as a ready reference to see quickly how relevant are the evidence/supporting documents being presented for each indicator. It should also make it easier to check initiatives implemented to achieve target improvements in the scores of the indicators.

For Peer Review (PR) Reports, it is hoped that the February 2008 workshop will provide an opportunity for the pilot RBOs to give feedback on the value they found in the self assessment and peer review process, the merits, or otherwise, of the different report and presentation formats (see PR Reports for LLDA and the Red River Basin Organization) and suggestions for improvement of the process and reporting formats.

- **Current Ratings.** All pilot RBOs rated their current performance according to the 14 indicators; however it was a challenge to provide compelling evidence to support the self assessment ratings. It may help make the ratings less arbitrary by giving more guidance as to what documents/reports/materials can be used to illustrate the ratings. As more RBOs undertake the self assessment and peer review further examples can guide succeeding assessments.
- **Setting Targets.** This is another area which needs further attention. The difficulty is partly due to the fact that most of the people engaged in the self-assessment and the peer review are yet to have an shared IWRM vision and a deeper understanding of the balanced-scorecard framework. The RBO has to know where it is going if it is to get there. This is an area where NARBO can probably provide assistance -- in setting really SMART targets.

In some cases the targets for the performance areas and indicators appear to have been set fairly arbitrarily. This reflects a lack of understanding that the four critical performance areas are in fact closely linked to each other. For instance, high targets are set for RBO governance and status and yet little performance improvement is expected in the finance, learning and growth, and internal business processes areas. Further capacity development in performance management will help RBO management set more realistic and balanced targets and to identify initiatives to achieve performance improvements that are identified in accordance with the organizations' budget and planning cycles. Benchmarking becomes effective when embedded in the organizations culture and business processes rather than being considered an external addendum.

- Overall, RBOs who have participated in the pilot phase should be encouraged to continue the review process, with occasional peer reviews to ensure a consistent standard and approach. With more practice will come better understanding and appreciation of the tool and process and the more useful will be the outcomes – ultimately improving the organizations performance which leads to the attainment of the IWRM mission.

The Online Benchmarking Service

- The service has taken a backseat while RBOs focused on getting a grip on the performance benchmarking concept and process. The NARBO membership may wish to consider whether the on-line service should be utilized by each RBO and whether the participating

RBOs are willing to use the on-line system to facilitate sharing of information. This aspect entails agreeing what information/details should be shared among RBOs.

III. Some Conclusions – for Discussion

- The initial success in the implementation of performance benchmarking pilots can be attributed to several key factors:
 - the strong commitment and full support of the top executive and management of RBOs backed by commitment of resources for the implementation. Without the buy-in and support of the top management, the performance benchmarking initiative cannot go far.
 - the appointment of highly capable and focused Self-Assessment Team which can facilitate the process and produce a clearly written SA Report;
 - the openness to learn and experience new things, the desire to improve performance and willingness share and contribute own knowledge and experience; and
 - a committed team of technically knowledgeable and experienced RBO peer reviewers who can lend credibility to the whole benchmarking process.
- Among the early benefits of the benchmarking initiatives are the increased awareness and appreciation among RBO staff on the potential usefulness of performance benchmarking particularly in identifying the organization's strengths and weaknesses, the investment gaps and where to focus resources in order to achieve target improvements in performance and implement IWRM.
- Having said the above, it should be emphasized that this is only the beginning of a **process** which needs a lot of time and resources. A better understanding of the NARBO benchmarking tool and the balanced scorecard approach will require a lot of practice. In turn, a better understanding of the benchmarking tool will mean a better performance and eventually reaping of greater benefits in terms of focused management and achieved targets.

IV. Way Forward – Suggestions for Discussion

- Discuss monitoring of progress in meeting performance targets – e.g. discuss how to develop a network of experienced people to support RBO activities especially continuous monitoring and reviewing of the implementation of recommendations
- Consider whether to continue performance benchmarking for other NARBO member RBOs and others. Consider the need to train more peer reviewers
- Discuss what to share and how to best use online performance benchmarking service – how best to share learning and outcomes among NARBO members
- Forge a closer link between the IWRM and performance benchmarking initiatives.

3rd NARBO General Meeting, Solo, Indonesia

ANNOUNCEMENT

Workshop 1: Measuring the Performance of RBOs and River Basins

21 February 2008, 9:15 am – 12:00 noon

Introduction

Performance improvement is important to River Basin Organizations (RBOs). There is recognition of the need to manage IWRM in river basins at the lowest appropriate level, with RBOs increasingly regarded as an institution playing a vital leading and facilitating role. With the greater role for RBOs comes the need to manage and improve their performance. NARBO's performance benchmarking service was launched in September 2005 after a one-year participatory design process. Since then, the service has been piloted by 4 RBOs, including a peer review process. The pilot peer reviews were conducted for Jasa Tirta 2 in Indonesia (October 2006), Mahaweli Authority of Sri Lanka (December 2006), Laguna Lake Development Authority in the Philippines (January 2007), and the Red River Basin Organization in Viet Nam (May 2007). A fifth pilot will be completed in February 2008 in the Citarum river basin, Indonesia.

NARBO is also working on introducing a methodology for benchmarking the performance of river basins, and this is also being piloted in the Citarum river basin, Indonesia.

Why You Should Come

The workshop will enable you to review the outcome and experiences from the pilot testing phase of the RBO performance benchmarking service and peer review process. The workshop aims to provide recommendations for expanding this NARBO program to more RBOs and basins in the region, Candidate RBOs/basins can express or reconfirm their interest during the workshop. A report on the pilot phase will be shared with participants, and conclusions and recommendations will be presented to the NARBO General Meeting on 22 February.

After opening remarks by ADB's Wouter Lincklaen Arriens, two presentations will be made to set the scene. The first, by Arlene Inocencio of IWMI, will summarize the experiences and lessons gained during the pilot application of the RBO performance benchmarking and peer reviews. The second presentation, by ADB's Christopher Morris, will summarize the outcome of recent research on methods to benchmark performance of river basins. There will be opportunity for clarifying questions after each presentation. A five minute discussion will allow the participants to raise points of clarification and to identify issues for further discussion after each presentation. The workshop then continues with one hour facilitated discussion involving a panel of experts and the participants in the audience. Facilitation will be done by ADB's Ian Makin. The workshop will then wrap up with take-away messages from the panelists, and a synthesis of lessons and way forward for reporting to the General Meeting.

Proposed Panelists

1. Mr. K.W. Ivan de Silva (MASL, Sri Lanka)
2. Mr. Tjoek Walujo Subijanto (PJT1, Indonesia)
3. Mr. Edgardo Manda (LLDA, Philippines)
4. Mr. Djendam Gurusinga (PJ2, Indonesia)
5. Mr. H. Hutagalung Waldemar (PJT2, Indonesia)
6. Ms. Sukontha Aekaraj (MONRE- Thailand)
7. Ms. Salmah Zakaria (NAHRIM, Malaysia)
8. Mr. Jan Yap (Consultant, World Bank, Indonesia)
9. Ms. Arlene Inocencio (IWMI)

Resource Persons

Wouter Lincklaen Arriens (ADB) (Chair)
Ian Makin (ADB) (Facilitator)
Christopher Morris (ADB)
Dennis Von C. Custodio (ADB Consultant)
Email: dvcustodio@adb.org

Program of NARBO IWRM Workshop 2 on February 21, 2008
Managing Assets and Risks
in Sustainable Improvement of Water Resources Infrastructures

Background

The Asia-Pacific Region encounters either problem of too much water or too little water by seasonal changes of the climate. This tendency of “too much water or too little water” becomes more significant due to the global climate change. The upper reaches of river basins which are steep and located at near-plate boundary zones are geologically vulnerable to volcanic eruptions and earthquakes. On the other hand, the lower reaches of river basins are formed of flood-prone alluvial plains. Once heavy rains hit the river basin areas, flood water flows quickly down to the sea causing sediment disasters such as erosion, landslides, debris flow and so on in the upstream areas and lethal impacts on socio-economic activities, specifically human lives and assets in the downstream areas.

Disaster risk increases concurrently as more Water demand is projected to increase with continued economic development in Asia-Pacific Region. People and assets are accumulating in the flood-prone alluvial plains than ever before. The region’s rich material environments are already degraded and under further pressure. Water resources and ecosystems need to be protected to ensure sustainable development to future generations. Governments need to improve their water infrastructures and strengthen their international capacity to address these challenges through effective water resources development and management.

Purpose

Current situations of Asian countries’ water resources management vary widely depending on the hydro meteorological conditions, socioeconomic development levels and prehistory of water resources management et al. We will especially focus on the development and sustainable management of water resources infrastructures and extract the issues and the challenges through presentations and discussions about current situations in Asia. We will clarify some directions of the NARBO activities in the next period by sharing the outcomes of Workshops 2 among NARBO members.

Program

Opening Program

Keynote Presentation 1

8:10 a.m. - 8: 40a.m.

Title: Japan’s Experiences in Water Resources Management and Some Implications to NARBO Members

Speaker: **Dr. Tsuneaki Yoshida**, Professor, the University of Tokyo, School of Frontier Sciences, Department of International Studies, Japan

NARBO IWRM Workshop 2

1. Opening

9:15 a.m. - 9:20 a.m.

2. Keynote Presentation 2

9:20 a.m. - 9:50 a.m.

Title: Sustainable Infrastructure and Asset Management

Speaker: **Dr. Kiyoshi KOBAYASHI**, professor, Deputy Director, Graduate School of Management, Kyoto University

3. Panel Discussion titled “Status & Future Strategies for Managing Assets and Risks in Sustainable Improvement of Water Resources Infrastructures

3-1: Reports by Panelists

(1) Title: Issues and solutions related the sustainable management of water resources infrastructure in NARBO member organizations **9:50 a.m.- 10:00 a.m.**

B-3 Workshop 2 Program

Speaker: Mr. Masahiro SUGIURA, NARBO Secretariat, Japan Water Agency

Theme : Thematic workshop is one of the NARBO activities and in which 5 members from BWDB of Bangladesh, PJT1 of Indonesia, DWR of Thailand, MASL of Sri Lanka and MARD of Vietnam discussed the issues and their solutions related sustainable management of water resources infrastructures. Mr. Masahiro Sugiura, NARBO Secretariat, will make a presentation the derived issues and concepts of projects for solving-issues as the outcomes of the workshop.

(2) Title: Outline of IRTCES Activities

10: 00 a.m. -10:10 a.m.

Speaker: Ms. Zhang Yanjing, Professor, Senior Engineer Department of Research & Training, International Research and Training Center on Erosion and Sedimentation (IRTCES)

Theme : IRTCES promotes the scientific research on erosion and sedimentation, and create a mechanism for exchange on the results of research among experts and implements many activities. IRTCES reports the current issues and measures against erosion and sedimentation especially in China, and proposes its future strategies for river basin conservation.

(3) Title: Community based (flood hazard) early warning system

10:10 a.m. - 10:20 a.m.

Speaker: Mr. Widyo Parwanto, Jasa Tirta I Public Corporation of Indonesia

Theme : Brantas and Bengawan Solo River Basin is characterized by steep, short and torrent rivers in upstream and middle reaches. Flood hazard in such rivers is evident, as no proper hydro-instrumentation could cover the whole watershed. Early warning system is installed in both basins, using simple technology, and involving the community. People are involved in maintaining this flood hazard early warning system is seen as a way to improve public participation.

(4) Title: Outline of ICHARM Activities

10:20 a.m. - 10:30 a.m.

Speaker: Mr. Akira TERAKAWA, Director, International Center for Water Hazard and Risk Management (ICHARM)

Theme : ICHARM promotes research, training and information networking activities, focusing on the issues and problems related water hazard management. ICHARM delivers the status of water related disasters especially in Asia, and proposes the future strategies for water hazard mitigation and risk management.

Break

10:30 a.m.-10:50 a.m.

(5) Title: Study on the asset management of dams focused on the reservoir sediment management

10:50 a.m. - 11:10 a.m.

Speaker: Dr. Tetsuya SUMI, Associate Professor. Graduate School of Management, Kyoto University and **Mr. Hiroyuki NAKAJIMA**, Director of Dam Administration Division, Kizukawa Comprehensive Dams Operation and Maintenance Office, Japan Water Agency

Theme: An asset management approach for sustainable maintenance of water resources infrastructures is one of the most meaningful challenges. Speakers conduct a study on the application of the asset management approach for Japan Water Agency's dams and reservoirs in Kizu River system in Japan, and raise the issues and challenges, and examine them in details. Preparation of appropriate plan for the investment and maintenance of dams and the integrated sediment management are indispensable.

3-2: Question and Answer Session and Conclusion (draft)

11:10 a.m. – 11:55 a.m.

4. Closing

11:55 a.m. – 12:00

B-3 Workshop 2 Program

Conclusion of NARBO IWRM Workshop 2 on February 21, 2008
Managing Assets and Risks
for Sustainable Improvement of Water Resources Infrastructures

Background

Infrastructure provides the foundation for a society, and promotes the economic growth in a country and a region, and enriches the quality of life for people as results. In other words, without infrastructure investment, it means no access to social services, expands a gap between rich and poor, and grows social disorder. Unlike the economic infrastructure that contributes to the industrial factors such as energy and transport, the water infrastructure provides the backbone forming the basic structure for socioeconomy in a country and a region. The water infrastructure is not only serving as facilities to develop and supply water resources for use of domestic, industrial and irrigation water, but also as facilities to prevent or mitigate water-related disasters due to floods, droughts and landslides.

Asia-Pacific region where the member organizations of NARBO are in existence is influenced by a monsoonal climate under which distinct patterns of rainy season/dry season emerge in the region, also precipitation varies substantially on a monthly basis, and more people and assets are accumulating in the flood-prone alluvial plains. Water demand is projected to increase with continued economic development in the Asia-Pacific region. Water related disaster risks arising from flood, drought and debris flow increase concurrently as more people and assets are accumulating in the flood-prone alluvial plains than ever before. Thus, the Asia-Pacific region encounters either problems of too much water or too little water by seasonal changes of the climate. This tendency of “too much water or too little water” becomes more significant due to the global climate change. The region’s rich natural environments are already degraded and under further pressure. Water resources and ecosystems need to be protected to ensure sustainable development to future generations.

Conclusion

Under the conditions the member organizations of NARBO are pushed as mentioned above and on the basis of the keynote speech in the opening program by Prof. Yoshida and the keynote speech by Prof. Kobayashi, the reports by panelists and the discussion by participants in this workshop, the following directions for NARBO activities in the coming years are adopted:

1. NARBO will more powerfully advance the network activities such as sharing of information and experiences, capacity building and institutional development than ever to be able to carry out sustainable improvement and maintenance of water infrastructure and deal appropriately with water related disaster risks arising from flood, drought, pollution and debris flow.
2. Participants recognize that it is essential to comprehend the conditions of socioeconomic development, hydrometeorology, water usage, and water-related disaster due to flood, drought, pollution and debris flow in the river basin, and to manage water infrastructure from the view points of the asset management and the water-related risk management for the purpose of improving it effectively and deriving the maximum benefit from its effective utilization and maintenance. We also recognize the necessity of further enhancement of the asset management and the water-related risk management as well. Thus, NARBO will gather the information about fruits of research of them and share it among the member organizations, and advocate an emphasis upon the research and development of the asset management and water-related disaster risk management for IWRM to authorities concerned.
3. NARBO will continue to support governments and RBOs in improving the enabling environment for IWRM, including policies, legislation, institutional development, and public awareness and participation. NARBO will also continue to facilitate the sharing of knowledge and experience in the development and management of water resources, in priority topics such as water rights, water quality management, and climate change adaptation. NARBO will pilot an advisory service for RBOs in the preparation of integrated water resources management and investment programs in river basins.

3rd NARBO General Meeting, Solo, Indonesia

Announcement

Workshop 3: Exploring New Challenges in IWRM Workshop Session on Addressing Issues and Challenges in Water Rights and Water Allocation 21 February 2008, 13:00 – 14:30

Introduction

Water rights is a topic of great interest to NARBO members as they help to introduce IWRM in river basins. However, the process of introduction and country-wide implementation of a licensing system for water use rights may well take as long as 20 years to complete. Making clear arrangements for practical solutions in the transition phase is therefore an important and urgent task, and these arrangements need to be flexible enough to respond to changing needs in water management as a result of continuing urbanization, climate change, and other drivers of change. Water rights and water allocation emerged as the top-ranked topic in a survey of training needs carried out among NARBO members. In response, NARBO initiated a series of workshops on the theme of water allocation and water rights in December 2005, in partnership with NARBO member organizations from Indonesia, Lao PDR, the Philippines, Thailand, Viet Nam and subsequently Sri Lanka. Over the period December 2005 - January 2007, representatives of national governments and river basin organizations met in a sequence of four workshops in Hanoi, Manila, Bangkok and Saitama, respectively. A culminating workshop on water rights was held at ADB's headquarters in May 2007.

Why You Should Come

The workshop will provide a better understanding of the principles and application of water rights and water allocation. The aim is to stimulate in-depth discussion on the challenges, practical solutions and lessons in the implementation of water rights, and to make recommendations for further NARBO activities that will assist governments, RBOs and civil society in the region in improving water rights and water allocation in the context of IWRM.

The workshop will start with the presentation by ADB's Wouter Lincklaen Arriens of a technical paper on water rights and allocation prepared by Jeremy Bird, Wouter Lincklaen Arriens, and Dennis von Custodio. After clarifying questions, facilitated discussion follows, moderated by ADB's Ian Makin. Panelists include members of the core group of specialists in the thematic workshop series, and other resource persons. The audience will also be involved in the discussion. The session will then wrap up with take-away messages from panelists and a synthesis of lessons and way forward for reporting to the General Meeting. Situational country updates will be available for reference at the workshop, prepared by core group members. A workshop report will be prepared afterwards, including (i) a summary of the session and participants views on challenges, practical solutions, and lessons in implementing water rights and water allocation during discussion; and (ii) consolidated progress reports from the countries that participated in the thematic workshop series.

Proposed Panelists

1. Mr. Elenito Bagalihog (NWRB/Philippines)
2. Ms. Sukontha Aekaraj (MONRE/Thailand)
3. Mr. Sudharma Elakanda (MASL/Sri Lanka)
4. Mr. Michitaro Nakai (JWA/Japan)
5. Mr. Herman Idrus (PJT2/Indonesia)
6. Mr. Rustam Abdukayumov (ADB/Uzbekistan)
7. Ms. Sun Feng (YRCC/People's Republic of China)
8. Mr. Vishal Gagan (Department of Water Resources, Orissa State, India)

Resource persons

Mr. Wouter Lincklaen Arriens (ADB)
Mr. Ian Makin (ADB) (Facilitator)
Mr. Dennis Von C. Custodio (ADB Consultant)
Email: dvcustodio@adb.org

Part C (Day3)

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5) Action Plan for 2008–2009

- 5-1 Proposal of New Program
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6) K-Water's Proposed Training Workshop in Taejon

7) IWRM Training and Technical Advisory Committee

8) Nomination of New NARBO Officials

3rd General Meeting of NARBO
Surakarta, February 20-22, 2008

1 – General

OPENING REMARKS

Chairperson of the Network of Asian River Basin Organizations (NARBO)



The honourable invitees,

The distinguished delegates,

The respectable representatives of international organizations

Dear members of the network and participants of the meeting.

Assamualaikum warrahmatullahi wabarakatuh.

May blessings from our almighty God be bestowed upon all of you.

First of all, allow me to extend a warm welcome to the Third General Meeting of our network. This meeting is one of the assigned responsibility in the NARBO Charter, therefore it has the paramount importance to existence of this network.

Like other general meetings before, this event is the venue where we as members of the network shall meet and evaluate our objectives based on the executed programs, this meeting serves also as an milestone to reflect and draw up important issues and visionary goals of the network. Beside that, this meeting is also an opportunity to assign responsibilities among the members and evaluate them.

I strongly suggest that all members, observers and involved parties participate actively in this general meeting as a focal point of commitment and consciousness of the network.

Four years has passed since we established NARBO in Batu, East Java. At the present moment NARBO has 56 members from several RBOs, international apex bodies, knowledge centers and organizations, all of them representing 9 nations. Various activities and programs have been conducted by the members and secretariat. Report on the activities will be part of this meeting, also in line to it I bode my hope that this general meeting will truly reflect our interest on enhance and promote integrated water resources management among river basin organizations in Asia.

It is designed that this general meeting is conducted in sequence with a study visit and a workshop. This is intended to enriched the participants on issues in integrated water resources management. Participant had visited yesterday the Bengawan Solo River Basin, especially the upper catchment area.

This typical monsoon river basin in Indonesia is visited as an example of the many typical issues in integrated water resources management in Asian countries. I endorse that result of this study vist will be used to provide comments and suggestions on water resources management.

For our program today, we will convene further on integrated water resources management. Critical issues and learning process are carefully designed for this workshop and I expect that this will serve us all well.

I hope that this workshop and general meeting will contribute directly to our need, especially for the NARBO member countries.

On behalf of the organizing committee, I would like to thank all the participating organizations, that financially made this meeting possible. The organizing committee has done in any possibility their best to make this meeting success, but should there be any inconvenience, I would like to apologize to the participants.

Finally, I kindly invite his excellency the Minister of Public Works of the Republic of Indonesia to officially open the Third General Meeting of NARBO and its appertaining workshop.

I wish to all participants a fruitful workshop and meeting. To our foreign friends, dear members and counterparts of NARBO, I wish you all a pleasant stay in Indonesia.

Thank you for your kind attention.

Wassalamu'alaikum warrahmatullahi wabarakatuh.

Surakarta, February 21st, 2008

NARBO Chairperson 2004-2008

M. Basuki Hadimoeljono

Message from Secretary General

It is my great pleasure to hold the Third NARBO General Meeting in Solo, Indonesia, following the Second General Meeting in February, 2006.

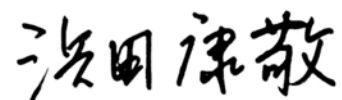
Four years have passed since our network was established in February 2004 to help achieve Integrated Water Resources Management (IWRM) in river basins throughout Asia monsoon region. Forty-three organizations from eleven countries joined in NARBO when NARBO was established. After that, however, our network has been expanding gradually; fifty-six organizations from thirteen countries were involved as of the end of 2007, and then, several organizations will newly join in NARBO at the Third Meeting.

The secretariat has been promoting NARBO activities positively in these two years after the former General Meeting. We can enumerate some prioritized activities such as information sharing and exchange, IWRM Training Courses, Performance Benchmarking Activity, Thematic Workshops, and Twinning Programs. The secretariat also carried out other activities such as the NARBO promotion activity in the Fourth World Water Forum held in Mexico, March 2006, and the symposium at the First Asia Pacific Water Summit held in Japan, December 2007.

At the Third General Meeting, the secretariat will propose "The Action Plan 2008-2009" based on the achievements and lessons learnt through last two-year activities. We need to help develop NARBO activities furthermore according to the new action plan. The advantage of NARBO is that it is the network where each member participates in various activities with its own will under the ownership. For further development of NARBO, I am really expecting that all members will participate in NARBO more actively. The secretariat also will make best efforts to develop more solid and practical activities.

Finally, I would like to express my sincere gratitude to Indonesian Central Government, and the organizing committee, namely, Jasa Tirta I Public Corporation, Balai Besar Wilayah Sungai Solo, Water Resources Research Center, and Indonesian NARBO members for their great contributions to the Third General Meeting.

NARBO Secretary General

A handwritten signature in black ink, written in Japanese characters. The characters are '濱田 康敬' (Hamada Yasutaka).

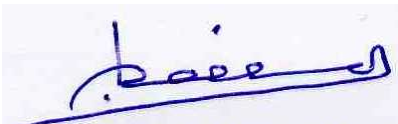
Yasutaka HAMADA

Message from Vice Chairperson



It is indeed with a great pleasure and satisfaction that I am sending this message to the 3rd General Meeting of NARBO, 20-22 February 2008, Surakarta City, Indonesia. From the inception itself, NARBO has demonstrated that all its identified activities have been performed as expected and all key players of member countries and staff of the NARBO secretariat, ADB & ADBI have fully committed towards the task. Similarly member countries volunteered to host most of the NARBO events in their countries. This clearly indicate how important and useful these actions to them. I hope that NARBO secretariat will be able to implement 2008/2009 program more effectively with the support of all member countries.

Also I take this opportunity to thank all relevant parties who helped to bring NARBO activities to a success.

A handwritten signature in blue ink, appearing to read 'K. W. De Silva', written over a horizontal line.

Eng K W Ivan De Silva.
Director General,
Mahaweli Authority of Sri Lanka,
Vice Chairperson,
NARBO



PROGRAM

The Third General Meeting Network of Asian River Basin Organizations (NARBO)

Time	Activity/Agenda	Acting Person	Venue	Remarks
Tuesday, Feb 19	Arrival and Registration			
	Participants arrive in Surakarta			
13:30 – 16:00	Secretariat Meeting (venue to be determined)			NARBO staff only
18.45 – 21.30	Welcome Dinner		Graha Tirta	
18:45 – 19:00	Participants transported from Sunan Hotel to Graha Tirta, Surakarta			By bus and coach
19:00 – 19:10	Welcome remarks from the Jasa Tirta I President Director	Ir. Tjoek Walujo Soebijanto, CES		
19:10 – 19:30	Introduction remarks from the Regent of Wonogiri	Drs. Begug Purnomosidi, MM		
19:30 – 20:30	Dinner (traditional music and dances accompanying: gambyong and gamelan)			
20:30 – 21:30	Presentation & introduction to the study visit itinerary			
20:30 – 21:00	Group 1: Managing Water Allocation and Sedimentation by Jasa Tirta I Public Corporation	Ir. Erwin Budoyo, M.Eng		
21:00 – 21:30	Group 2: Facilitating IWRM in Planning and Implementation by Development Agency of Bengawan Solo	Ir. Imam Agus Nugroho, Dip.HE		
21:30	Participants transported back to Sunan Hotel			
Wednesday Feb 20	Study Visit			
07:45 – 08:00	Preparation for departure			
08:00 – 09:00	Travel to Wonogiri			By bus and coach
09:00 – 10:00	Meeting with the Wonogiri Regency Administration			
	Group 1: Sedimentation Problem & Water Allocation within the Bengawan Solo R.B.			
10:00 – 10:15	Travel to confluence of Keduang River & Wonogiri Dam	Accompanied by Ir. Aunur Rofiq, CES		
10:15 – 12:00	Site visit & dialogue	Hosted by Ir Erwin Budoyo, M.Eng & Ir. Harianto	Wonogiri Dam Office	PJT I & water user association
12:30 – 13:00	Lunch break			
13:00 – 14:00	Travel to Colo Weir			By bus and coach
14:00 – 14:30	Site visit at Colo Weir		Colo Weir	Explanation on site

Time	Activity/Agenda	Acting Person	Venue	Remarks
14:30 – 15:30	Travel back to the hotel			
	Group 2: Public Participation and Bottom-Up Approaches in Water Resources Planning			
10:00 – 10:45	Travel to Gemawang Village	Accompanied by Ir. Rochadi Masyhadi, Dip.HE		By bus and coach
10:45 – 12:00	Site visit at Gemawang & dialogue with stakeholders involved in the PCM process	Hosted by Ir. Tri Rohadi, Dip.HE	Gemawang Village Office	Ir. Edhie Subagio, Dip.HE & Ir. Suwartono, Dip.WR
12:00 – 12:30	Lunch break			
12:30 – 14:00	Continue dialogue with stakeholders			
14:00 – 15:00	Travel back to the hotel			
Thursday 21 Feb	Opening Program & IWRM Workshops			
08:00 – 09:00	Opening Program		Ball Room III	
08:00 – 08:10	Opening remarks by the NARBO Chairperson	Dr. Ir. M. Basuki Hadimoeljono, M.Sc.		
08:10 – 08:40	Keynote presentation 1 by Tokyo University	Dr. Tsuneaki Yoshida		
08:40 – 09:00	Official address by the HE Minister of Public Works	Djoko Kirmanto, Dip.HE		
09:00 – 09:15	Coffee Break			
09.15-12.00 Parallel Session	Workshop 1: Measuring the Performance of RBOs and River Basins	Chaired: Wouter Lincklaen Arriens Facilitator: Ian Makin	Ball Room II	
	Opening remarks	Wouter Lincklaen Arriens		
	Lessons learned from the 4 pilot RBO peer reviews	Dr. Arlene Inocencio		
	Exploring ways to benchmark river basin performance	Christopher Morris		
	Facilitated discussion further development and applications	<u>Panelists:</u> K.W. Ivan de Silva (MASL, Sri Lanka), Tjoek Walujo Subijanto (PJT I, Indonesia), Edgardo Manda (LLDA, Philippines), Djendam Gurusinga (PJT II, Indonesia), H. Hutagalung Waldemar (PJT II, Indonesia), Sukontha Aekaraj (MONRE-Thailand), Dr. Salmah Zakaria (NAHRIM, Malaysia), Jan Yap (Consultant, World Bank, Indonesia) Dr. Arlene Inocencio (IWMI)		
	Summary and Way Forward	Wouter Lincklaen Arriens		
09.15-12.00 Parallel Session	Workshop 2: Managing Assets and Risks – chaired by JWA	Chaired by Mr. Miichio Oota, Facilitated by Mr. Azizul	Ball Room III	

Time	Activity/Agenda	Acting Person	Venue	Remarks
		Rahman (Bangladesh)		
	Keynote: by Kyoto University, Japan	Dr. Kiyoshi Kobayashi		
	Issues and solutions related to the sustainable management of water resources infrastructure in NARBO member organizations – by JWA (Japan)	Mr. Masahiro Sugiura		
	Outline of International Center for Water Hazard and Risk Management (ICHARM) activities – by ICHARM (Japan)	Mr. Akira Terakawa		
	Outline of International Research and Training Center on Erosion and Sedimentation (IRTCES) activities – by IRTCES (China)	Ms. Zhang Yanjing		
	Community based (flood hazard) early warning system – by Jasa Tirta I Public Corporation (Indonesia)	Mr. Harianto		
	Study on the asset management of dams focused on the reservoir sediment management – by JWA and Kyoto University (Japan)	Mr. Hiroyuki Nakajima & Dr. Tetsuya Sumi		
12:00 – 13:00	Lunch Break		Rice Crispy	
13:00 – 17:00 Plenary Session	Workshop 3: Exploring New Challenges in IWRM	Chaired: Dr. M. Basuki Hadimoeljono Facilitator: Dr. M. Amron	Ball Room III	
13:00 – 14:30	Addressing issues and challenges in water rights and water allocation/review of thematic workshop on water allocation and water rights – led by Asian Development Bank (ADB) with ADB Institute and JWA	<insert name>		
14:30 – 15:00	Facilitating IWRM with civil society and private sector participation – by Bengawan Solo River Basin Development Agency (Indonesia)	Mr. Tri Rochadi		
15:00 – 15:15	Coffee break			
15:15 – 16:00	Restoring the health of rivers – by Asian River Restoration Network (ARRN)	Mr. Akira Wada & Mr Masafumi Ito		
16:00 – 16:25	Sharing IWRM experience from other regions – by International Network of River Basin Organizations (INBO)	Dr. Jean F. Donzier		
16:25 – 17:30	Discussion			
19:30 – 21:30	Side event – NARBO Indonesia Meeting		Kono Room	
Friday 22 Feb	Third General Meeting		Ball Room III	
07:30 – 08:00	Registration			
08:00 – 09:00	Opening Program			
08:00 – 08:15	Opening address – by NARBO Chairperson	Dr. Ir. M. Basuki Hadimoeljono, M.Sc.		
08:15 – 08:30	Remarks on Japan's support for IWRM in Asia – by Director General of Water Resources, Ministry of Land, Infrastructure and Transportation (MLIT) Japan	Mr. Shuhei Kazusa		
08:30 – 09:00	Keynote presentation on water and climate change – by Director General, National Hydraulic Research Institute of Malaysia (NAHRIM) and head of Asia	Dr. Ir. Salmah Zakaria		

Time	Activity/Agenda	Acting Person	Venue	Remarks
	Pacific Water Forum's candidate regional knowledge hub on climate change			
09:00 – 12:00	Report on NARBO Activity 2006-2007	Chaired by the Chairperson NARBO (Mr. M. Basuki Hadimoeljono), Vice-CP (Mr. Ivan da Silva), Secretary General (Mr. Yasutaka Hamada)		
09:00 – 09:05	Introduction by ADBI	Mr. Michitaro Nakai		
09:05 – 09:10	Overview – by NARBO Secretary General	Mr. Yasutaka Hamada		
09:10 – 09:25	Newsletter and Website – by JWA (Japan)	Mr. Akira Nishimura		
09:25 – 09:35	IWRM Training Programs – by Mahaweli Authority (Srilanka)	Mr. Elakanda Sudaharma		
09:35 – 09:50	Twining Program – by Jasa Tirta II Public Corporation (Indonesia)	Mr. Ananto M.		
09:50 – 10:20	Coffee Break			
10:20 – 10:35	K-Water's collaboration activity in Citarum River Basin (including proposed K-Water training workshop in Taejon) – by K-Water (South Korea)	Dr. Ick Hwan Ko		
10:35 – 10:45	Thematic Workshop – by JWA and ADBI	Mr. Michitaro Nakai		
10:45 – 10:55	NARBO performance benchmark peer review – by ADB HQ	Mr. Ian Makin		
10:55 – 11:05	NARBO at the Asia Pacific Water Summit – by JWA (Japan)	Mr. Michio Oota		
11:05 – 11:10	NARBO Promotion Activity – by JWA	Mr. Shinobu Ifuji		
11:10 – 11:25	NARBO and Regional Water Knowledge Hubs – by ADB HQ	Mr. Wouter Lincklaen Arriens		
11:25 – 11:30	Report on NARBO Survey	Mr. Michitaro Nakai		
11:30 – 12:00	Plenary Discussion	NARBO Secretariat		
12:00 – 13:00	Lunch Break		Rice Crispy	
13:00 – 13:05	Introduction	Mr. Michitaro Nakai	Ball Room III	
13:05 – 13:30	Introduction of New NARBO Members Recognition, introduction and approval – by NARBO Secretariat	Mr. Wouter Lincklaen Arriens		
13:30 – 13:35	Overall Review on NARBO's Program 2008-2009	Mr. Yasutaka Hamada		
13:35 – 13:45	Briefing on Workplan 2008-2009	Mr. Michitaro Nakai		
13:45 – 15:20	Briefing on New Programs (2008-2009)			
13:45 – 13:55	Charting Progress and Facilitating Investment for IWRM (10 minutes)	Mr. Wouter Lincklaen Arriens		
13:55 – 14:05	Preparation of Guidelines for IWRM at River Basin Level (10 minutes)	JWA		
14:05 – 14:15	Asian Regional Knowledge Hub on RBO Management (10 minutes)	Ministry of Public Works (Indonesia)		
14:15 – 14:25	NARBO IWRM Training & Technical Advisory Committee (TAC) (10 minutes)	NARBO Secretariat		

Time	Activity/Agenda	Acting Person	Venue	Remarks
14:25 – 14:35	Thematic Workshop on adaptation for Climate Change (10 minutes)	Indonesia NARBO		
14:35 – 15:20	Plenary Discussion (45 minutes)	NARBO Secretariat		
15:20 – 15:35	Coffee Break			
15:35 – 15:55	NARBO Charter Revision – by NARBO Secretariat	Chaired by: Vice-Secretary General NARBO (Mr. Michio Oota) & Mr. Wouter Lincklaen Arriens		
15:55 – 16:10	NARBO Constitutional Body 2008-2009 Nomination and selection – by NARBO Secretariat			
16:10 – 16:20	Acceptance remarks – by incoming NARBO Chair, Vice-Chair, and Secretary General			
16:20 – 16:45	Wrap up session, plenary discussion with comments and commitments by NARBO members – led by ADB Headquarters	Chaired by Mr. Wouter Lincklaen Arriens		
16:45 – 16:55	Closing remarks 1 - by NARBO Vice Chairperson	Mr. Ivan da Silva (Srilanka)		
16:55 – 17:05	Closing remarks 2 – by Directorate General of Water Resources, Ministry of Public Works, Indonesia	Represented by Mr. M. Amron		
17:05 – 17.10	Photo session			
19:00 – 21:30	Farewell Dinner		Ball Room III	
Saturday 23 Feb	Check out and Departure			

3rd General Meeting of NARBO

Surakarta, February 20-22, 2008

2 – Report of NARBO Activities 2007-2008

[Record of activities 2006-2007]

Here's the record of activities for two years. About the details of each activity, please refer to "The Work Plan 2006-2007" attached below.

No.1

Year	Month	Name of Activity	Outline of activity
2006	February	The 2nd General Meeting	- Held in Jatilufur, Indonesia on 14-16 February - Hosted by PJT II - Attended by almost 100 delegates from 9 countries
	February	NARBO News Letter	7th Issue
	March	The 4th World Water Forum	- Chairperson Dr. Basuki delivered a speech to introduce NARBO
	May	NARBO News Letter	8th Issue
	May-June	Twinning Program, JWA - Indonesian NARBO	- 4 staff were dispatched from JWA to Indonesia NARBO in May - 4 staff were dispatched from Indonesia NARBO to JWA in June
	June	The 2nd Thematic Workshop on Water Allocation and Water Rights	- Held in Manila, the Philippines on 6-9 June - Hosted by NWRB and LLDA - Attended by 26 delegates from 7 countries
	October	NARBO News Letter	9th Issue
	October	The 3 rd APHW Conference	- JWA dispatched 1 staff, giving a presentation to introduce NARBO
	October	Performance Benchmark Peer Review for Jasa Tirta II	- Held in Jatilufur, Indonesia on 30 October - 2 November - Hosted by PJT II - Attended by 37 delegates from 7 countries
	November	IWRM Training Course IV	- Held in Sri Lanka on 6-10 November - Hosted by MASL - Attended by 18 delegates from 6 countries
	November	The 3rd Thematic Workshop on Water Allocation and Water Rights	- Held in Bangkok, Thailand on 28 November - 1 December - Hosted by DWR, MoNRE - Attended by 35 delegates from 7 countries
	December	Performance Benchmark Peer Review for Mahaweli Authority of Sri Lanka	- Held in Sri Lanka on 12-15 December - Hosted by MASL - Attended by 74 delegates from 5 countries

Year	Month	Name of Activity	Outline of Activity
2007	January	The 4th Thematic Workshop on Water Allocation and Water Rights	- Held in Saitama, Japan on 23-26 January - Hosted by JWA - Attended by 9 delegates from 7 countries
	March	NARBO News Letter	10th Issue
	April	Performance Benchmark Peer Review for Laguna Lake Development Authority	- Held in Manila, the Philippines on 9-13 April - Hosted by LLDA
	May	Thematic Workshop on Water Rights	- Held in Manila, the Philippines on 29-31 May - Hosted by ADB, NWRB and LLDA - Attended by 30 delegates from 7 countries
	June	The 1st Thematic Workshop on Sustainable Management for Water Resources Infrastructures	- Held in Hanoi, Vietnam on 12-15 June - Hosted by MARD - Attended by 16 delegated from 5 countries
	June	Performance Benchmark Peer Review for Red River Basin Organization	- Held in Hanoi, Vietnam on 12-15 June - Hosted by RRBO - Attended by 5 delegates from 5 countries
	August	NARBO News Letter	11th Issue
	August	Twinning Program, JWA - Indonesian NARBO	- 3 staff were delegated from Indonesia NARBO to JWA
	October	The 2nd Thematic Workshop on Sustainable Management for Water Resources Infrastructures	- Held in Dhaka, Bangladesh on 24-27 October - Hosted by BWDB - Attended by 14 delegates from 4 countries
	October	The 3rd South East Asia Water Forum	- Vice Chairperson, Mr. Ivan de Silva, delivered speech to introduce NARBO
	November	The Workshop on Disaster Management in Developing Countries	- Held in Yogyakarta on 26-29 November - Hosted by PJTI - Attended by 9 delegates from 8 countries
	December	The Symposium on Catalyzing IWRM Investment in Asia-Pacific Region	- Held in Beppu, Japan on 1 December, as a Open Event for the Asia Pacific Water Summit (APWS)
	December	The 3rd Thematic Workshop on Sustainable Management for Water Resources Infrastructures	- Held in Sri Lanka on 12-16 December - Hosted by MASL - Attended by 10 delegates from 5 countries

NETWORK OF ASIAN RIVER BASIN ORGANIZATIONS (NARBO) ACTION PLAN 2006-2007

Latest Revised Version for NARBO 3rd General Meeting Brochure

- A. Advocacy, Raising Awareness, and Exchange of Information and Good Practices on Integrated Water Resources Management (IWRM)
- B. Capacity Building in River Basin Organizations (RBOs)
- C. Network Support

(Revised of 16 Feb, 2006)
 (Updated on March 26, 2007)
 (Update on December 27, 2007)

Activity	Remarks	Implementation Program	Leading Agency	Note (latest)
<p>Activities led by the NARBO Secretariat:</p> <p>1. NARBO Website (http://www.narbo.jp) The NARBO Web site will provide news and updates, information and reminders about NARBO's activities. The site linked to other related sites will release publications, case studies, electronic newsletters and online data bases</p>	<p>The website is managed by the Japan Water Agency (JWA) in collaboration with the Asian Development Bank (ADB) and the Asian Development Bank Institute (ADBI). It will be updated on regular basis.</p>	<ul style="list-style-type: none"> - Provide prompt and useful information. - Update Web site contents with frequency. - Manage database with various contents. - Implement on-line forum after feasibility study being conducted and its effectiveness being considered. 	<p>JWA</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Priority</div> <ul style="list-style-type: none"> - NARBO members' positive involvement regarding information gathering is essential. - JWA NARBO Secretariat has been making continuous efforts

					to fulfill members' requests such as lightening the size of website for the quicker display.
<p>2. NARBO Newsletter (E-news letter) The newsletter covers topics on good practices, lessons learned, activities etc.</p>	<p>JWA will issue newsletters. Basically, newsletters will be distributed by e-mail and via the website.</p>	<ul style="list-style-type: none"> - Newsletters are being basically issued in every three month. - To ensure sending newsletters by email, organize email addresses informed and conduct survey of email accessibility of each recipient - The 8th edition was issued on May 18, 2006 - The 9th edition was issued on October 12, 2006. - The 10th edition was issued on March 7, 2007 - The 11th edition was issued on August 28, 2007 	JWA	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">Priority</div> <p>NARBO members' positive involvement regarding information gathering is essential.</p>	
<p>3. Online data base Necessary materials developed on IWRM practices are compiled. Materials comprise lessons learned in river basins in Asia, standards and manuals, recommended formats for river basin organization (RBO) annual reports, reference materials on IWRM, and topics of interests, etc.</p>	<p>ADB and JWA will lead this work in collaboration with ADB and other partners concerned. The reports and materials will be accumulated in the database continuously. Contents of Online data base are distributed in CDs.</p>	<p>Compile various information as much as possible from member organization.</p>	<p>ADB, JWA</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">Priority</div> <p>NARBO members' positive involvement regarding materials gathering is indispensable.</p>	

<p>Materials are shared through website and in CDs.</p>				
<p>4. NARBO Annual Report Drawing on member organizations' inputs, the report will summarize NARBO's activities.</p>		<ul style="list-style-type: none"> - NARBO Annual Reports will be distributed through website and CDs. - NARBO Annual Report 2005 was issued on June 22, 2006 - NARBO Annual Report 2006 was issued in June, 2007. 	<p>JWA</p>	<p>RBO Members are requested to submit their reports by the end of March the following year</p>
<p>5 Media Relations and NARBO Promotion and Dissemination NARBO will implement a media strategy to send key messages on IWRM and the work of RBOs, and promotes NARBO's objectives and activities at suitable events in the region.</p>	<p>The Media Relations and NARBO Promotion will be conducted to attract great interest in NARBO's activities and to increase NARBO member</p>	<ul style="list-style-type: none"> - ADB will develop the concept media strategy by June 2006. - The development and implementation of a media strategy will be initiated and supported by ADB as part of ADB's Water Awareness Program - JWA will promote NARBO and its activities by taking advantage of every opportunity in order to draw the attention to NARBO and to increase the number of the members. 	<p>ADB, JWA</p>	<p>Put much emphasis on increasing NARBO member</p>

<p>6. NARBO General Meeting The general meeting is held, in principle, every two years in accordance with NARBO Charter, and JWA will lead the Secretariat's work to organize the meeting in consultation with the NARBO Chairperson.</p>		<p>- The 2nd General Meeting was held in Indonesia, February from 14 to 16, 2006</p>	<p>Chair person and Vice-Chair person JWA ADB ADBI</p>	<p>The 3rd General Meeting will be held in the first quarter of year 2008.</p>
<p>7. Remarkable events</p>				
<p>8. Others</p>				

<p>Activities led by NARBO Member Organizations:</p> <p>1. NARBO members' websites NARBO member organizations develop and maintain their own websites and post relevant information on their activities in relation with IWRM and its implementation.</p>	<p>NARBO members should update them at least quarterly basis. JWA will encourage NARBO members to do so. NARBO secretariat will use the member websites to accumulate relevant information on activities for the NARBO website.</p>	<ul style="list-style-type: none"> - NARBO members are expected to develop their own web site by December, 2006. - NARBO members should strive to develop informative web site and to provide news and updates via online. - JWA will survey current situation of member's web site, 	<p>NARBO members</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Priority</div> <p>All members are encouraged to update the websites.</p>
<p>2. NARBO members' Annual Report NARBO RBO members are obliged to submit an annual report on their activities in accordance with guidelines prepared by the NARBO Secretariat.</p>	<p>The member's annual reports will be prepared by RBOs and submitted to NARBO Secretariat by March 2005. Other NARBO members are expected to prepare an annual report too.</p>	<ul style="list-style-type: none"> - The annual reports 2005 will be prepared RBOs and should be submitted to NARBO Secretariat by March 2006. - 12 member organizations contributed annual report 2005. They are: <ul style="list-style-type: none"> ○ Red River Basin Organization (Vietnam) ○ Japan Water Agency (Japan) ○ Korea Water Resources Corporation (KOWACO, Korea) ○ Mahaweli Authority of Sri Lanka (MASL, Sri Lanka) ○ Department of Water Resources (MoNRE, Thailand) ○ Department of Water Resources 	<p>RBOs</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Priority</div> <p>It is highly expected all RBO members submit an annual report 2005 by the end of March 2006</p>

		<p>(MARD, Vietnam)</p> <ul style="list-style-type: none"> ○ Asian Development Bank (ADB, Philippines) ○ Asian Development Bank Institute (ADBI, Japan) ○ Laguna Lake Development Authority (LLDA, Philippines) ○ Jasa Tirta I Public Corporation (PJT I, Indonesia) ○ Jasa Tirta II Public Corporation (PJT II, Indonesia) ○ International Water Management Institute (IWMI, Sri Lanka) ○ Sembrani Foundation (Indonesia) <p>- The annual reports 2006 should be prepared RBOs and submitted to NARBO Secretariat by March 2007.</p> <p>- 7 member organizations contributed annual report 2006. They are;</p> <ul style="list-style-type: none"> ○ Mekong River Commission (MRC: Lao PDR) ○ Jasa Tirta I Public Corporation (PJT I, Indonesia) ○ Jasa Tirta II Public Corporation (PJT II, Indonesia) ○ Red River Basin Organization (RRBO: Viet Nam) ○ Mahaweli Authority of Sri Lanka (MASL: Sri Lanka) ○ Japan Water Agency (JWA: Japan) ○ Asian Development Bank Institute 	
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		(ADB: Japan)		
B. Capacity Building in River Basin Organizations (RBOs)				
Activity	Remarks	Implementation Program	Leading Agency	Note (latest)
Activities led by the NARBO Secretariat: 1. IWRM Training Program IWRM Training program is promoted in order for member organizations to develop their capacities. With an advantage of NARBO network, it is expected to diversity in training resources among members and others. Member organizations are expected to propose to be a host organization of the training.	In principle Training courses will be held 2 times every year. Training courses will be designed by the host organization, contributing organizations and the leading agencies with guidelines for participants selection, contents, modalities, organizational structures and cost sharing.	<ul style="list-style-type: none"> - The 4th training course was held in Sri Lanka from November 6 to 10 with 18 trainees from 6 countries. - Following Training courses will be held. <ul style="list-style-type: none"> • The 5th training course: Nov. 2006. • The 6th training course: Jun. 2007. • The 7th training course: Nov 2007. 	JWA, ADB, ADBI, KOWACO	<div style="border: 1px solid black; padding: 5px; display: inline-block; margin-bottom: 10px;">Priority</div> NARBO Members are encouraged to be recipients organization

<p>2. Workshops Regional workshops will be held in conjunction with NARBO General Meeting. Thematic workshops in order to deepen discussion on specific themes concerning water resources management suggested by NARBO members.</p>	<p>Sub-regional workshops will be considered on demand. Deal with thematic workshop highly recommended by NARBO members. Organize workshops in series</p>	<ul style="list-style-type: none"> - The Thematic Workshop on Water Allocation and Water Right will be held in NARBO member's country, May 2006. Oct 2006, and May 2007. - The Thematic workshop on Facilities Management will be held in 2006. <p>Thematic Workshop on Water Allocation & Water Rights</p> <ul style="list-style-type: none"> - The 2nd workshop was held in Manila, the Philippines on 5-9 June with 26 participants from 7 countries. - The 3rd workshop was held in Bangkok, Thailand on November 27- December 1 with 35 participants from 7 countries. - The 4th workshop was held in Saitama, Japan on 22-26 January, 2007 with 11 participants from 6 countries. - The extra workshop was held in Manila the Philippines on 29 - 31 May, 2007 with 30 	<p style="text-align: center;">JWA, ADB, ADBI</p>	<table border="1" style="width: 100px; margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Priority</td> </tr> </table> <p>Small-scale workshops focusing on specific topics are preferable. NARBO Members are encouraged to be recipients organization</p>	Priority
Priority					

		<p>participants from 7 countries.</p> <p>Thematic Workshop on Sustainable Water Infrastructure Management</p> <ul style="list-style-type: none"> - The 1st workshop was held in Hanoi, Vietnam on 11-14 June, 2007 with ** participants from ** countries. - The 2nd workshop was held on 24 - 27, October in Dhaka, Bangladesh with ** participants from ** countries. - The 3rd workshop was held on 12-16 December, in Sri Lanka with ** participants from ** countries. <p>The Workshop on Disaster Management in Developing Countries was held on November 26-29, 2007 in Yogyakarta, Indonesia, with 9 participants from 8 countries.</p>		
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<p>3. Performance Benchmarking Establishment of Performance Benchmarking system for RBOs is supported by peer reviews. Performance improvement of RBOs is stimulated and practical exchange of experience is allowed.</p>	<p>The program is designed by NARBO Benchmarking Group consisting of ADB and IWMI in consultation with NARBO members.</p>	<ul style="list-style-type: none"> - The RBO Benchmarking Workshop will be held in NARBO member's country, Apr 2006, Sep 2006, Apr 2007 and Sep 2007. - The 1st peer review was held in Jatiluhur, Indonesia on October 31 - November 3, 2006 with 15 officials from 8 RBOs and they were certified as peer reviewers. - The 2nd peer review was held in Sri Lanka on 12-15 December with ** participants from ** countries. - The 3rd peer review was held in Manila, the Philippines on 9-13 April with ** participants from ** countries. - The 4th peer review was held in Hanoi, Vietnam on 12-15 June with ** participants from ** countries. 	<p style="text-align: center;">ADB IWMI</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">Priority</div>
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<p>4. Advisory visits to RBOs NARBO Secretariat staff visits RBOs to learn their work to implement IWRM and to provide advice and support for knowledge generation and sharing.</p>	<p>This activity can be collaborated with RBO exchange visit.</p>	<p>NARBO Secretariat will consider and determine implementation method by Aug. 2006.</p>	<p>JWA, ADB, ADBI</p>	
<p>5. Scholarship Programs NARBO Secretariat explores opportunities to promote participation of NARBO member organization staff in existing scholarship programs in the region and beyond.</p>	<p>NARBO Secretariat explores opportunities and welcome suggestions from NARBO members, knowledge partner organizations, academe and potential sponsors.</p>	<p>NARBO Secretariat will present an scholarship opportunity online Information is available on the NARBO web-site.</p>	<p>JWA, ADB, ADBI</p>	<p>Providing information on scholarship from NARBO members is anticipated.</p>

<p>Activities led by NARBO Member Organizations:</p> <p>1. RBO Centers of Excellence NARBO will recognize RBOs as centers of excellence in specific areas of IWRM expertise and stimulate opportunities for members to access and use the expertise within the network.</p>		<ul style="list-style-type: none"> - JWA will conduct research on NARBO members intention until Aug., 2006 and consider the possibility of arranging program. 	<p>JWA, ADB, ADBI</p>	<p>RBOs will indicate areas of expertise.</p>	
<p>2. Twinning Programs RBOs will facilitate Twinning Program for closer relations among NARBO members. Various forms of the program highly recommended such as information exchange, staff exchange and exchange visit.</p>	<p>To be initiated and arranged by RBO members. Information will be stored, classified and accessed by members on the website.</p> <p>Exchange visit between NARBO Members is a step before entering Twinning Programs between 2 (two) NARBO Members</p> <p>Intensive communication between NARBO Members is encouraged to establish closer relationship between NARBO Members.</p>	<ul style="list-style-type: none"> - Existing Twinning Program will be continued. Other new agreements on Twinning Program among NARBO members are highly expected. - Japan Water Agency (JWA) and Indonesian NARBO conducted the twinning program in 2006 and 2007. In 2006, 4 JWA staff visited Indonesia from May 14 to 25, and also 4 Indonesia NARBO staff visited JWA from June 11 to 25. In 2007, 3 Indonesia NARBO staff visited JWA in August. 	<p>NARBO members</p>	<table border="1"> <tr> <td style="text-align: center;">Priority</td> </tr> </table>	Priority
Priority					

<p>3. ISO certification RBOs will explore opportunities for ISO certification to stimulate achievement and maintenance of standards.</p>	<p>To be initiated and led by Jasa Tirta I and II. It is desirable to continue to have the opportunities to lecture on ISO certification.</p>	<p>RBO Members-who interested in ISO Certification are kindly encourage to collaborate with Jasa Tirta I & II</p>	<p>Jasa Tirta I, Jasa Tirta II</p>	
<p>4. Transboundary Water Management RBOs will explore opportunities to foster regional cooperation for improving water resources management in transboundary river basins through sharing of information and exchange of experience.</p>		<p>- NARBO Secretariat will encourage considering the feasibility of transboundary water management</p>	<p>RBOs</p>	<p>Sharing information and experience accordingly. MRC will share their information and experiences.</p>

C. Network Support				
Activity	Remarks	Implementation Program	Leading Agency	Note (latest)
<p>1. Technical Advisory Committee NARBO is considering the establishment of a technical advisory committee in accordance with the provision in the NARBO Charter, to support NARBO's work.</p>		<ul style="list-style-type: none"> - NARBO Secretariat will consider and determine implementation method by Aug. 2006. 		<p>The details and the target time of the set up of the committee need to be discussed among JWA, ADB and ADBI. Any comments and suggestions are highly welcome</p>
<p>2. Financial Resources The NARBO Charter provides the possibility to convene a financial support group to extend financial support for NARBO activities from other multilateral and bilateral agencies.</p>			<p>ADB</p>	

<p>3. Charting IWRM Program in Asia</p> <p>Charting IWRM Program in Asia will be undertaken a study of practical progress of implementing IWRM in river basins in the region, supported by ADB and IUCN, to improve exchange of information and experience, build capacity, present a region-wide perspective on the progress of IWRM, identify further actions needed, and expand NARBO's activities.</p>	<p>ADB IUCN</p>		
<p>4. Facilitating IWRM Investment Project</p> <p>Facilitating IWRM Investment Project will be helped by NARBO members to promote investments and financing for IWRM in their river basins, by getting advice from other members and partners in identifying and preparing river basin projects.</p>	<p>ADB</p>		

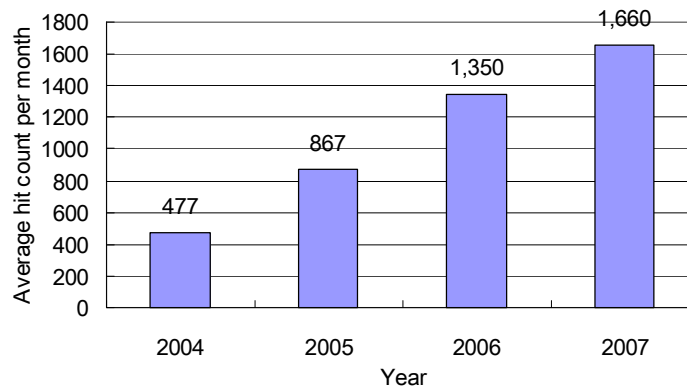
[Report on Website and Newsletter]

1. Website

a) Hit count

NARBO website is being administered by one of the secretariats, namely Japan Water Agency (JWA). From the viewpoint of the recognition that website is the important tool for sharing and exchange of information among members and it is needless to say that members' contribution is crucial.

Average hit count per month has been increased up to approximately 1,660 in 2007, although it was only 477 in 2004.



Average hit count on NARBO website

In addition, NARBO secretariat has clarified the popularity of each category in the website (see twelfth issue of NARBO Newsletter). As a result, it was found that “Photos of member countries” and “Twinning Program” are relatively popular.

b) Database

A screenshot of the NARBO website's database login page. The page has a blue header with the NARBO logo and navigation links. Below the header, there is a 'Database' section with an 'ID' field, a 'Password' field, and an 'enter' button. To the right of the screenshot, there are two numbered instructions in boxes: '1) Click 'Database'' with an arrow pointing to the 'Database' link, and '2) Input 'narbomember'' with an arrow pointing to the 'Password' field. Below the instructions, there is a 'Password:' label followed by a text input field.

1) Click 'Database'

2) Input 'narbomember'

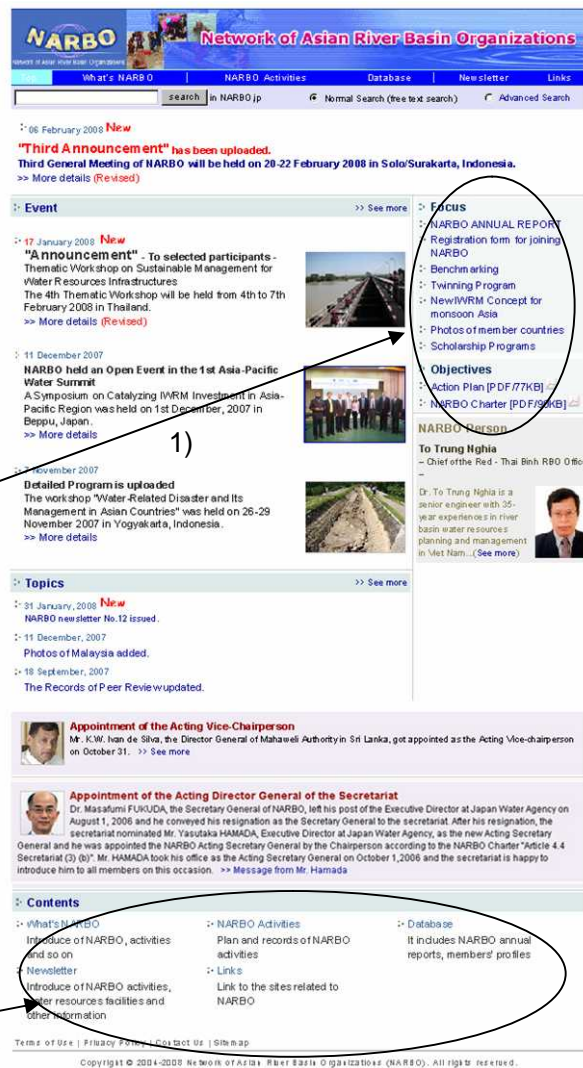
By visiting this database, you can get information on details of NARBO activities, members' information, guideline for implementation of NARBO training, etc. This page is opened to only NARBO members, so please access and utilize this database!

c) Improvement

As design improvement in order to read easily, shift of character font and rearrangement of website structure have been wholly conducted. As a result, for example, 1) 'Action Plan' and 'NARBO Charter' were independent of Focus category, and 2) 'Contents' and the corresponding Sitemap was rearranged.



The top page as of January 2006



The counterpart as of January 2008

2. Newsletter

a) Issue frequency

Newsletter is recognized as another useful tool for NARBO activities along with website and JWA is in charge of newsletter. In the same manner as the website, members' positive involvement regarding information gathering is essential.

JWA has issued 6 newsletters (from 7th to 12th) between 2006 and 2007. All newsletters were posted on NARBO website to make it possible for all members to read easily.

Issue of NARBO newsletter

Month	Name	Version
Feb 2004	Preparatory Issue	PDF
Apr 2004	First Issue	PDF
Aug 2004	Second Issue	PDF
Nov 2004	Third Issue	PDF
Feb 2005	Fourth Issue	PDF
May 2005	Fifth Issue	PDF
Aug 2005	Sixth Issue	PDF
Feb 2006	Seventh Issue	PDF
May 2006	Eighth Issue	PDF
Oct 2006	Ninth Issue	PDF
Mar 2007	Tenth Issue	PDF
Aug 2007	Eleventh Issue	PDF
Jan 2008	Twelfth Issue	HTML / PDF

b) Improvement

As shown in the above table, **HTML version has been issued from twelfth issue on January 2008** so that members can read the newsletter without opening a PDF file attached to e-mail. Improvement of easiness to read may be remained to be solved.

[The Forth NARBO training course in Sri Lanka]

The Forth NARBO training course was held in Sri Lanka from November 6 to November 10 for about 5 days with great cooperation with the Mahaweli Authority of Sri Lanka. The training course was participated by 18 persons from six Asian countries- Bangladesh(2), Indonesia(2), Pakistan(1), Philippines(1), Vietnam(5), Sri Lanka(4) and Two JWA and one from ADB. The theme of this training was "Water for all - Lessons Learnt and Meeting Future Challenges" which was very timely theme and relevant to all the South East Asia and South Asian countries.

1st day was devoted for giving some clear understanding about Past-Present & Future of Hydraulic Civilization of Sri Lanka and Current Water Management in Sri Lanka-Overview, by presentations made by two eminent resource persons from Sri Lanka. Then country paper presentation was made by each organization participated. 2nd and 3rd day were devoted for Fields Program which was planned to visit Victoria-Randenigala- Rantembe complex and meet Farmers Organization to have very close interaction to understand the grass-roots level situation of Water Management. 4th and 5th day programs were very attractive for them to actively participate for the sessions and finally concluding ceremony.

This training was definitely a good opportunity for the participants to learn from Sri Lankan experiences with water-related sector issues. (The course fee was US\$200 per person.)



Visiting Farmers Organization (3rd day)



Group Presentation (5th day)

[Brief Report on Twining Program 2006-2007]

1. What is Twining Program?

An agreement on Twining Program was signed in November 2004, between Japan Water Agency (JWA) and Indonesian NARBO. This personnel exchange program under Twining Program was agreed as part of NARBO activities to share knowledge and information among NARBO member organizations and enhance their capacity to implement IWRM (Integrated Water River Management). Since the agreement, personnel to/from JWA and Indonesia NARBO had been dispatched annually. First personnel were exchanged in 2005 and this year marks its 3rd anniversary.

We are convinced that this program will give much profit to each other. Your joining to this program is highly expected.

2. Brief Report of Activities in 2006

The aim of this program in 2006 is to promote the improvement of system of sharing experiences for water resources management and technology by the close collaboration of practitioners of both.

For this, site visits to know the actual situation was concentrated in the program. Staffs dispatched from JWA visited site in Jakarta, Bandung, Semarang and Yogyakarta, whereas staffs from Indonesia visited sites of Tone weir, Urayama dam and Toyogawa canal project.

Through these visits, the background of current and future issues has been made clear, and we recognized we would continue the collaboration for both. Especially, both have installed appropriate technology to meet the needs of peoples at the practitioners' point of view.



In the gallery of Urayama Dam (Japan)



In the southern part of Yogyakarta (Indonesia)

3. Brief Report of Activities in 2007

The aim of this program in 2007 is to introduce Japanese experiences on IWRM to Indonesian NARBO experts and to share information of both countries.

For this, JWA accepted 3 civil engineers, two from Jasa Tirta I Public Corporation and one from Jasa Tirta II Public Corporation, for a month.

- At field visits

- (1) Gunma Canal, Naramata Dam, Yagisawa Dam

As proverb says "Seeing is believing," JWA arranged a field visit to JWA's facilities in the first week of the program, such as dams and canals. Indonesian staff learned the overview of operations and management of those facilities and its daily tasks.

- (2) Tokuyama Dam, Nagaragawa Estuary Barrage, Lake Biwa, and Kagawa Canal

In the fourth week, JWA organized field visits to major project sites of JWA in the central and western part of Japan such as Tokuyama Dam where first filling of reservoir is conducted, Nagaragawa Estuary Barrage, Lake Biwa, and Kagawa Canal.

Indonesian staff asked many questions whenever they had, giving comparison between Japan and Indonesia. Moreover, JWA staff and Indonesian counterparts exchanged information about each country's system eagerly.

- At JWA Headquarters

- (1) Lectures

JWA staff conducted lectures in many fields including on JWA's organization, completed and ongoing projects, and some examples of implementing IWRM in Japan

- (2) Sharing information

JWA staff and Indonesian counterparts exchanged questions and answers about operation and management of water resources facilities between the two countries.

- (3) Presentation

There were two sessions; first session was about explaining their operation and management of water resources facilities and second session was about summarizing what they had learned during the program.



On a patrol ship of Lake Biwa



Presentation of their final report

NARBO 3rd General Meeting, 22 February 2008, Solo Indonesia

K water's Collaboration Activity in the Citarum River Basin

Dr. Ick Hwan Ko
Director
K water Research Center



Water Issues in the Citarum Basin

Citarum Basin (Indonesia)

= Han River Basin (Korea)?

As the M&I water demands are increasing, water pollution in the Canal will adversely affect

- > stable water supply to JKT Metropolitan, and
- > sustainable management of the Citarum basin!

Need for Participatory IWRM Approach!

- sound technological base & capacity building
- public awareness on water issues in the Citarum

PDA Project Description

Title

Development of a Water Quality Management System for the West Tarum Canal of Citarum River Basin in West Java Province

Period

December 5, 2006 ~ December 4, 2007

Object

To pilot an approach through systematic monitoring of water quality and the development of a system to support better water quality management in the context of Integrated Water Resources Management (IWRM) of the CRB

Support

Project Team

Korea Water Resources Corporation (K water)
Jasa Tirta II Public Corporation (PJT II)

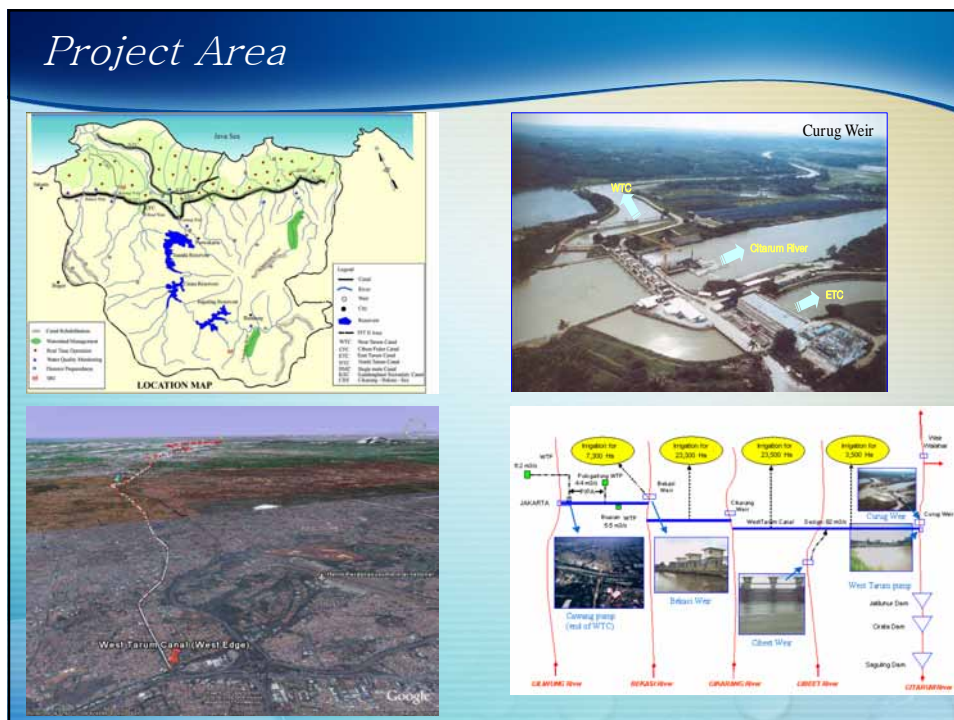
Project Team (K water)

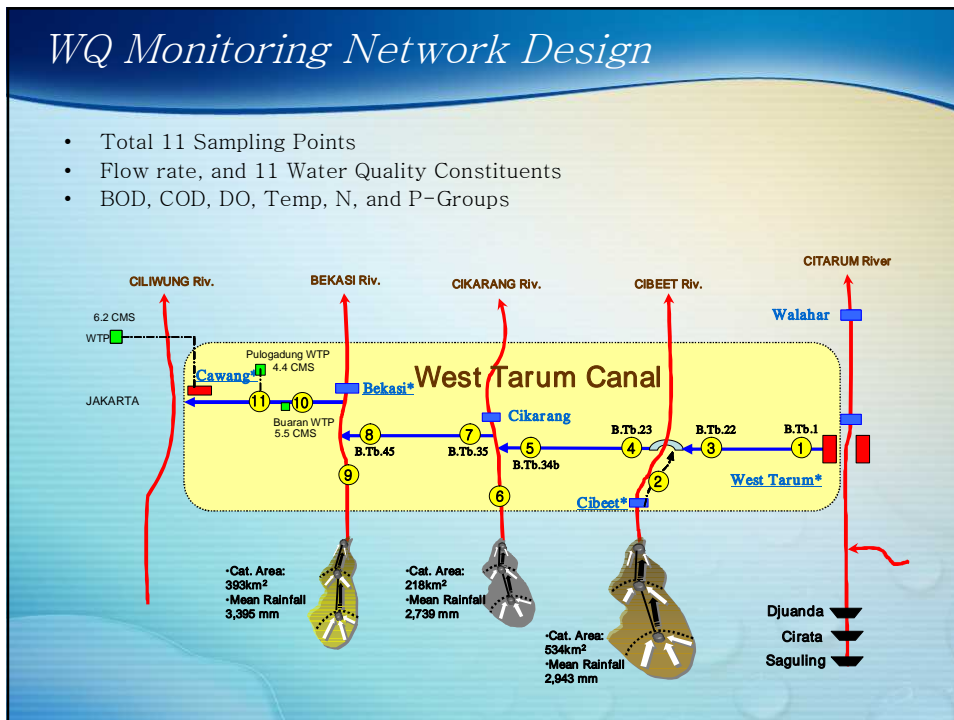
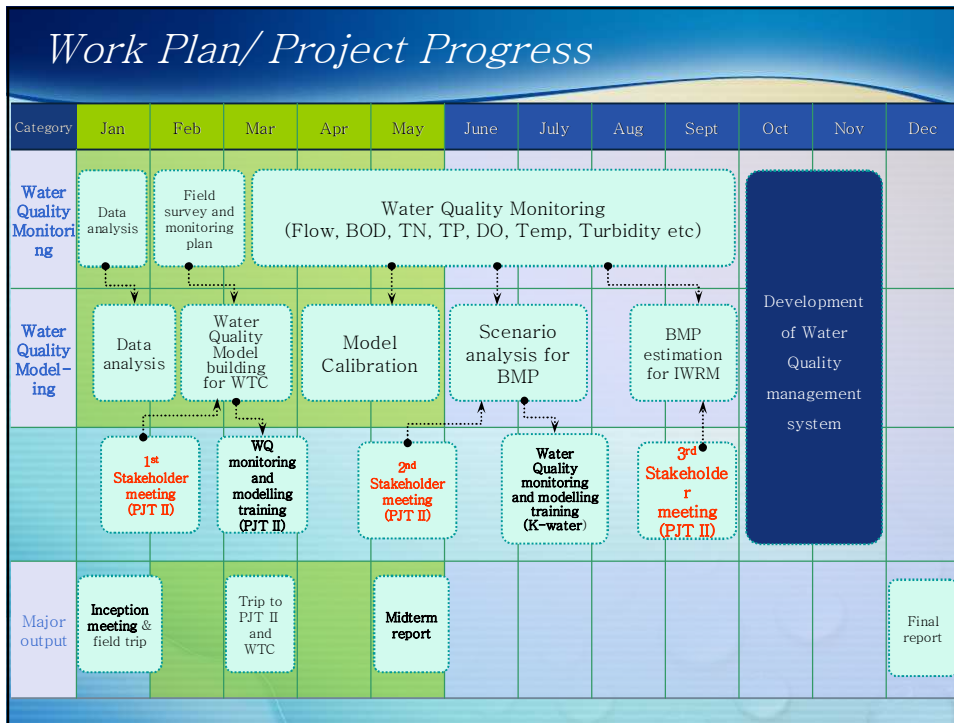
Roles	Name and Position
Project Manger	Dr. Ick Hwan Ko Director of K water Research Center
Water Quality Management Specialist	Dr. Jeongkon Kim Principal Researcher
Water Quality Modeling Specialist	Dr. Joonwoo Noh Senior Researcher
Water Quality Monitoring Specialist	Dr. Sangyoung Park Senior Researcher
Water Quality Specialist	Mr. Sang Uk Lee Researcher

Project Team (PJT II)

Roles	Name and Position
Project Leader	Herman Idrus, CES Head of Planning Bureau
Water Quality Modeling Specialist	Erni Murniati, M.Sc Staff Planning Bureau
Monitoring Specialist	Udien Yulianto, M.Tech Staff Laboratory and Engineering Consultancy Services Unit
Hydraulic / Hydrology Engineer	Resky Heravenu ST Staff Division I

Project Area





Progress of Project

WQ Monitoring

WQ Modeling

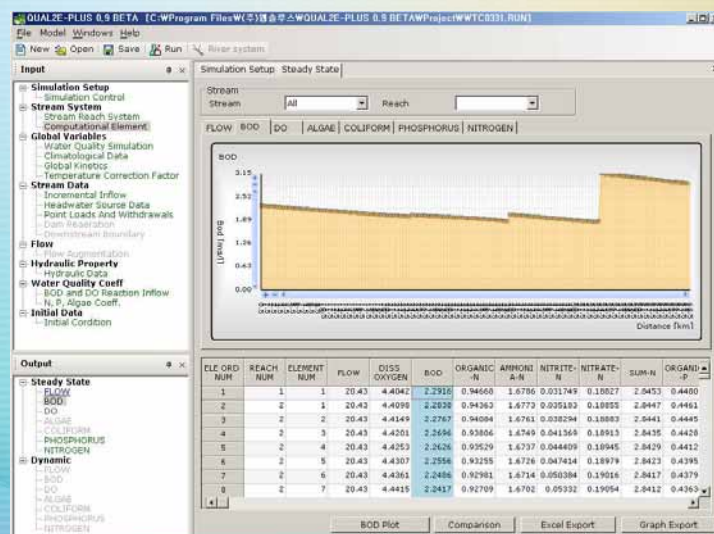
Capacity Building

Stakeholders' Participation

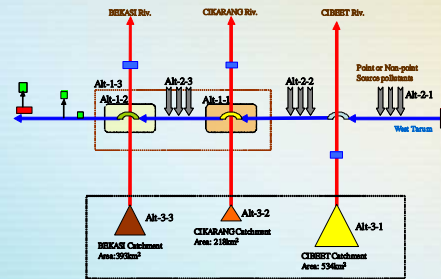
- QUAL2E-Plus is used for WQMS
- QUEAL2E-Plus: Steady-state, Non-uniform flow model
 - Developed by K-water based on QUAL2E
 - Advanced GUI for easy input & output data manipulation
 - Developed under .NET Framework environment



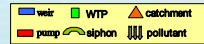
Result of Model Run



Scenario development



Alt-1: local resources separation using siphon
 Alt-2: reducing pollutant sources along the canal
 Alt-3: water quality improvement in the tributaries



- ALT-1: Local resources separation using siphon
- ALT-2: Non-point source management
- ALT-3: Water quality improvement in the tributaries

Inception Meeting (30 Jan 2007)

Discussion on a detailed work plan for project implementation

Participants from ADB, Indonesian NARBO, PJT II, and Kwater



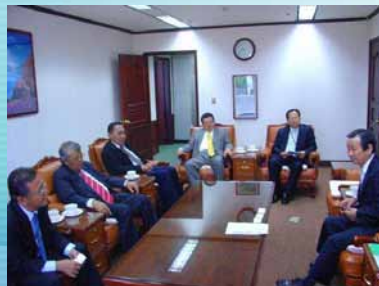
1st Stakeholders' Meeting

- on 23 March 2007 in Jartiluhur in Indonesia
- 8 organizations shared ideas, knowledge, & experience wrt the PDA Project



Institutional Capacity Building

- DG of Water Res Dev., Ministry of Public Works and President Director of PJT II visited Kwater for institutional capacity building from 14th to 18th of May 2007



2nd training session in Korea in July 2007



- 6 project staffs from PJT II visited K-water for institutional for capacity building from July 26 to 20, 2007.
- The Indonesian staffs visited the water resources operation center of K-water and exchanged their concerns and experiences about water-related issues in both countries especially on water quality management.

Obtained Outputs from the Project

A comprehensive **water quality monitoring network** for WTC

Water quality database (BOD, DO, Turbidity, TN, TP, etc.) based on the adequate monitoring activities

A sound **water quality modeling system** for WTC

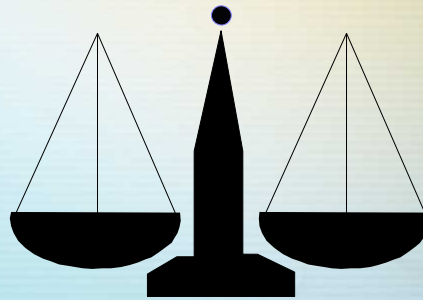
Increased capacity of PJT II and stakeholders in water quality monitoring and modeling technology

Increased public awareness on water quality issues

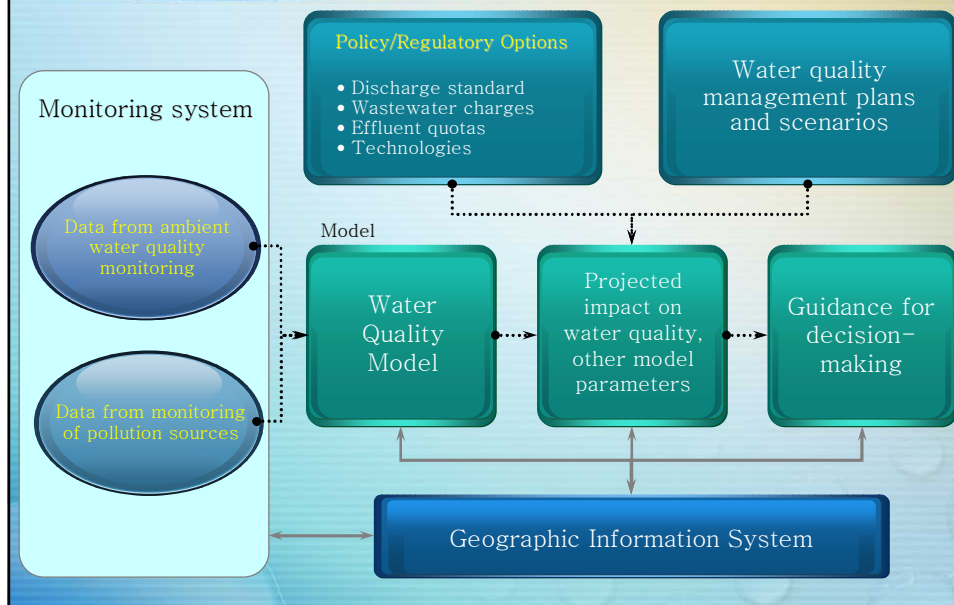
– stakeholder participation & interaction

Three Key Factors to Consider to Attain IWRM Solutions

- Legal / political institutional setting
- Sound technical knowledge base
- Public involvement and consensus building



Water Quality Management System



How to use the developed System?

The system will serve for water quality management in the context of IWRM of the CRB!

- compiling hydrologic/hydraulic data,
- conducting water quality monitoring/evaluation & prediction
- promoting collaboration among the Citarum basin water managers, national/local stakeholders & the public

Establishment of basic strategies and BMP

- for sustainable environmental and water resources management applicable for the WTC area
- [and later for the whole CRB]

How to prepare for the Citarum basin?





A Proposal for

NARBO/APWF Knowledge Hub

Workshop on

basin water quality management

Trainings offered Previously

➤ NARBO's 3rd Training Workshop on IWRM

- 14 – 18 November 2005, Daejeon, Korea
- Topic: "Technology for IWRM – River Basin Approach"
- Participants:
 - 25 from RBOs of NARBO member countries
- Main objective:
 - To share experiences of developing and applying technologies for Integrated River Basin Water Resource Management among Asian countries

Opening Session



management (IWRM) – RIVE
2005 Co-organized by NARBO and KOWACO in Collabora



Leadership Workshop on Integrated Water Resources Management

- Jointly organized by K-water and UNESCAP
- 17-20 September 2007
- Participants:
 - 15 government officials working in water resource management from 9 Asian countries
- Main objective :
 - To enhance leadership for the efficiency and sustainability of water resources management at the national level

Leadership Workshop on Integrated Water Resources Management



A Proposal for workshop on basin water quality management

river

- **Background**
 - The Asia-Pacific Water Forum (APWF) was launched in 2006 to improve sustainable water management
 - A new approach of Knowledge Hubs was suggested for countries with advanced expertise and existing centers of excellence in the region to offer their services as regional water knowledge hubs
 - At the regional consultation meeting in Singapore in October 2007, Kwater was designated as the candidate **Regional Water Knowledge Hub for Water Quality Management in River Basins**.
 - As a part of the activities for the knowledge hub and 2008-2009 NARBO, Kwater proposes a workshop with the main theme of 'integrated river basin water quality management' under the concept of IWRM.

- **Expected date**
 - 3 days in September 2008
- **Location**
 - Korea Institute of Water and Environment (KIWE) in K-water, Daejeon, Korea
- **Expected Participants**
 - 25 people (including 20 Trainees and 10 Invited Speakers/Lecturers)

- Main Issues to be covered:

- Lectures

- Role of water quality management in IWRM
- Integrated River-Reservoir water quality management
- Model applications

- Hands-on Practice with steady and unsteady water quality models developed by K water

- On site training

- Field Trip to Geum River Basin

- Individual & Group Discussion

Thank You!!

How to promote the IWRM Process?

Open & Transparent Process

- **Common Assumptions & Estimates of Management Strategies**
- **Common Data**
- **Common Analytical Tools**

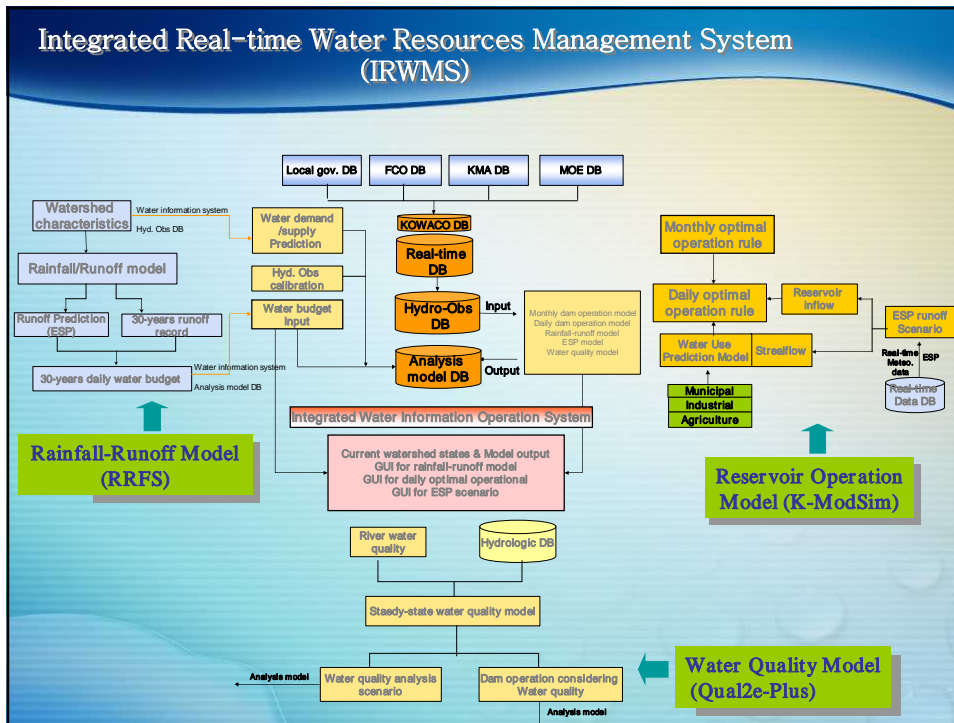
Functions

- **National/Regional Water Planning**
- **Water-related Conflict Resolution**
- **Various Trade-off Analysis**

 **Final Goal : Mutual Trust & Consensus Building**

How to promote IWRM Process? (Need for Collaborative Leadership)

- If you bring the appropriate people together in constructive ways with good information, you can create authentic SHARED VISIONs and STRATEGIES for addressing and implementing IWRM in the whole Citarum basin!
- Based on SOUND TECHNOLOGY and Multi-sectoral/ muti-disciplinary Participatory Approach!



[Brief Report on Thematic Workshop on Water Allocation and Water Rights]

Thematic Workshop on Water Allocation and Water Rights has held four times during the past two years as follows. NARBO Secretariat greatly appreciated the efforts and contribution from the staff of all the host organizations as well as attendants.

1. Second Workshop in the Philippines

Date: 6-9 June 2006

Place: Manila, the Philippines

Host: National Water Resources Board (NWRB) and Laguna Lake Development Authority (LLDA)

Participants: 26 delegates from 7 countries



2. Third Workshop in Thailand

Date: 28 November - 1 December 2006

Place: Bangkok, Thailand

Host: Department of Water Resources (DWR), Ministry of Natural Resources and Environment (MoNRE)

Participants: 35 delegates from 7 countries



3. Fourth Workshop in Japan

Date: 23-26 January 2007

Place: Saitama, Japan

Host: Japan Water Agency

Participants: 9 delegates from 7 countries



4. **Extra Workshop in the Philippines (focused on water rights system)**

Date: 29-31 May 2007

Place: Manila, the Philippines

Host: ADB HQ, NWRB, and LLDA

Participants: 30 delegates from 7 countries



Owing to the series of the Thematic Workshop, the attendants could share and exchange the current situation and issues on water allocation system in each attendant's country, and they set goals to improve their issues on water allocation as the final outcome. NARBO secretariat hopes that water professionals in each country would continue to make efforts to achieve the goals, improving the water situation.

[Brief Report on Thematic Workshop on Sustainable Water Infrastructure Management]

The Sustainable Management for Water Resources Infrastructures becomes a very important tool to practice water resources management and it has been worked on by various methods in each country. About water resources management in particular, we must aim to draw out function of facilities at a maximum. In this respect we would like to take this opportunity to discuss concrete issues and to share experience with each country.

1. First Workshop in Vietnam

Date: 11-14 June 2007

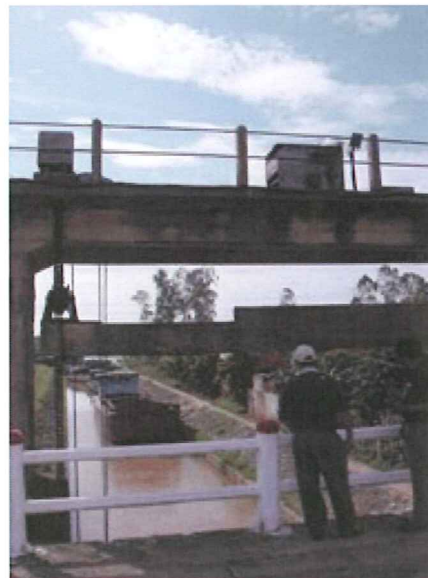
Place: Hanoi, Vietnam

Host: General Office of RBO, Ministry of Agriculture and Rural Development

Participants: 16 delegates from 5 countries



Scene of Workshop



Scene of Study Visit

2. Second Workshop in Bangladesh

Date: 24-27 October 2007

Place: Dhaka, Vietnam

Host: Bangladesh Water Development Board

Participants: 14 delegates from 4 countries



Discussion on site



Scene of Workshop

3. Third Workshop in Sri Lanka

Date: 24-27 October 2007

Place: Colombo, Sri Lanka

Host: Mahaweli Authority of Sri Lanka

Participants: 9 delegates from 5 countries



Scene of Workshop



Scene of Study Visit

4. Fourth Workshop in Thailand

Date: 4-7 February 2008

Place: Bangkok, Thailand

Host: Mahaweli Authority of Sri Lanka

Participants: 14 delegates from 6 countries



Scene of Workshop



Scene of Study Visit

[Brief Report of Thematic Workshop on Water-Related Disaster and Its Management in Asian Countries]

Based on the previous Action Plan of 2006-2007, NARBO is planning a series of three workshops on the theme of Water-Related Disaster and Its Management in Asian Countries.

The first workshop was carried out and the characteristics and issues on water-related disaster management were identified.

1. First Workshop in Indonesia

Date: 25-29 November 2007

Place: Yogyakarta, Indonesia

Host: Serayu-Opak River Basin Office of Yogyakarta

Participants: 9 delegates from 8 countries



Session in the workshop
(Sabo Technical Center)




Sharing in disaster experiences with
local residents (in Bantul District)

The workshop's goal is to develop 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.

The coming second and third workshops are planning as follows.

- Second Workshop, in the Philippines, July or August 2008
Objective: Evaluate strategies and solutions to address the issues.
- Third Workshop, in selected participant's country, last half of 2008
Objective: Present and discuss participants' action plan.




Network of Asian River Basin Organizations

Report on Pilot Program on RBO Benchmarking and Peer Review

3rd General Meeting
Surakarta, Indonesia
22 February 2008


NARBO 3 GM – 22 February 2008



Performance Benchmarking and Peer Review

- Benchmarking and peer review adopted at NARBO 1st General Meeting, Batu-Malang, February 2004
- Indicators and Guidelines developed through members workshops in Jatilihur, October 2004 and Batu-Malang, November 2004.
- Pilot phase launched at 2nd Southeast Asia Water Forum, Bali September 2005.
- Process reviewed and approved at 2nd General Meeting, Jatilihur February 2006

NARBO 3 GM – 22 February 2008



Performance Benchmarking and Peer Review

- Peer reviewer training and 1st pilot application at PJT 2 (Jatilihur) in October 2006
- Further pilot applications at Mahaweli Authority Sri Lanka (December 2006); Laguna Lake Development Authority, Philippines (January 2007) and Red River Basin, Viet Nam (May 2007)

NARBO 3 GM – 22 February 2008



Performance Benchmarking and Peer Review

- Basin Performance Benchmarking developed during 2007 and pilot tested at: (i) Laguna Lake Development Authority and (ii) Belai Bersar Citarum in 2008.
- Workshop on Measuring Performance of River Basin Organizations and River Basin's held on 21 February 2008, Surakarta

NARBO 3 GM – 22 February 2008



Key lessons and observations

The value is in the process not in the numbers

learning from

Benchmarking is about change!

The best RBOs will not just use "best-practice" they will create it!

How do we know where we are and where we want to go?

NARBO

Network of Asian River Basin Organizations

Some remaining questions

If RBO improves performance how can we attribute basin status to this?

How do we apply Performance benchmarking to the whole basin with multiple agencies?

Need to identify what we should do! And what we should not do in benchmarking!

NARBO 3 GM – 22 February 2008

Network of Asian River Basin Organizations

Recommendations for 2008-2010 Program

1. Expand RBO benchmarking and peer review to more basins (taking into account feedback from pilot phase)
2. Implement an expanded pilot test of Basin Performance Benchmarking
3. Develop expanded collaborations with organizations (INBO, GWP, CapNET, World Bank) to ensure synergy in approach.

NARBO 3 GM – 22 February 2008



Thank You

NARBO 3 GM – 22 February 2008



[Brief Report on the Symposium on Catalyzing Investment in Asia Pacific Region]

“NARBO Symposium on Catalyzing IWRM investment in Asia-Pacific Region”, was held on 1 Dec (Beppu City Social Welfare Center, Beppu City, Oita Prefecture) as the Open Event for the Asia-Pacific Water Summit (APWS, 3-4 Dec, Beppu City, Oita Prefecture). This symposium, attended by more than 100 audiences from 11 countries, was organized by Japan Water Agency, Asian Development Bank (ADB) and ADB Institute as NARBO Secretariat, in collaboration with the Ministry of Land, Infrastructure and Transport (MLIT) and the Infrastructure Development Institute of Japan.



We discussed and finalized a recommendation paper, which is summarized as follows.

- NARBO continues to support governments and RBOs in improving the enabling environment for IWRM, including policies, legislation, institutional development, and public awareness and participation. Also, NARBO continues to facilitate the sharing of knowledge and experiences in the development and management of water resources, in priority topics such as water rights, disaster management, water quality management, and climate change adaptation.
- NARBO will elaborate the practical guideline for implementing IWRM in Asia monsoon region in collaboration with existing NARBO members, in time for the fifth World Water Forum in March 2009, Turkey.
- NARBO will prepare a long-term plan for introduction of IWRM in river basins across the region.

Network of Asian River Basin Organizations (NARBO)
-- Symposium on Catalyzing IWRM investment in the Asia-Pacific Region--
Report to the 1st Asia-Pacific Water Summit

1 December 2007, Beppu City Social Welfare Hall

Participants from 11 countries met on the eve of the 1st Asia Pacific Water Summit to discuss key challenges for integrated water resources management (IWRM) in the region, and future directions for NARBO to assist governments and river basin organizations (RBO). The Symposium was convened by Japan Water Agency, Asian Development Bank and ADB Institute as NARBO Secretariat, in collaboration with the Ministry of Land, Infrastructure and Transport and the Infrastructure Development Institute of Japan. Key points discussed were as follows.

Recognizing that:

1. The eastern and southern parts of the Asian Continent and the northern parts of Indonesia and Australia are influenced by a monsoonal climate under which distinct patterns of rainy season / dry season emerge in the region, and also precipitation varies substantially on a monthly basis. Thus, the Asia-Pacific Region encounters either problem of too much water or too little water by seasonal changes of the climate. This tendency of “too much water or too little water” becomes more significant due to the global climate change.
2. Generally speaking in the Asia-Pacific Region, the upper reaches of river basins which are steep and located at near- plate boundary zones are geologically vulnerable to volcanic eruptions and earthquakes. On the other hand, the lower reaches of river basins are formed of flood-prone alluvial plains. Once heavy rains hit the river basin areas, flood water flows quickly down to the sea causing sediment disasters such as erosion, landslides, debris flow and so on in the upstream areas and lethal impacts on socio-economic activities, specifically human lives and assets in the downstream areas.
3. Water demand is projected to increase with continued economic development in the Asia-Pacific Region. Disaster risk increases concurrently as more people and assets are accumulating in the flood-prone alluvial plains than ever before. The region’s rich natural environments are already degraded and under further pressure. Water resources and ecosystems need to be protected to ensure sustainable development to future generations. Governments need to improve their water infrastructures and strengthen their institutional capacity to address these challenges through effective water resources development and management.

Appreciating that NARBO’s 56 member organizations are starting to make an effective contribution to the introduction of IWRM in river basins across the Asia-Pacific region since the network was established in 2004, the participants adopted the following directions for NARBO activities in the coming years:

1. NARBO will facilitate the implementation of IWRM in the Asia-Pacific Region taking account of its characteristic features, including the occurrence of water-related disasters arising from floods and droughts, the continuing increase of water demand due to economic development and urbanization, and widespread deterioration of water quality and environment in river basins. To help RBOs develop locally appropriate solutions in river basins, NARBO will elaborate the IWRM approach in practical guidelines that reflect the rich and diverse experience across the region. The guidelines will be prepared in collaboration with member RBOs and knowledge partners, in time for presentation to the 5th World Water Forum in 2009 in Turkey.
2. Drawing on its first five years of experience, NARBO will also prepare a long-term plan for introduction of IWRM in river basins across the region, to help governments and RBOs achieve the MDGs and respond to the unprecedented transformation facing the region in the management of water resources, including the increased variability and risks brought by climate change.

3. NARBO will continue to support governments and RBOs in improving the enabling environment for IWRM, including policies, legislation, institutional development, and public awareness and participation. NARBO will also continue to facilitate the sharing of knowledge and experience in the development and management of water resources, in priority topics such as water rights, disaster management, water quality management, and climate change adaptation. NARBO's performance benchmarking and peer review service will be expanded, and NARBO will pilot an advisory service for RBOs in the preparation of integrated long-term investment programs in river basins.

[Brief Report on NARBO Promotion]

In the past two years, the promotion activities of NARBO had been continuously and widely carried out. Major actions are listed below and the secretariat had carried out at the occasions of many internal & international events. For further dissemination of NARBO, this activity will be continued in collaboration with members.

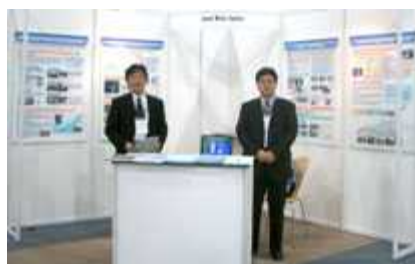
Through these promotion activities, NARBO urged its practical viewpoint on institution, realistic approach from the site and importance to respect the background for water management.

Date	Activity Contents
March 2006	The 4th World Water Forum
October 2006	The 3 rd Asia Pacific Association of Hydrology and Water Resources (APHW) Conference
October 2007	The 3rd South East Asia Water Forum
December 2007	The symposium on Catalyzing Investment in Asia Pacific Region (As a Open Event for Asia Pacific Water Summit)

1. The 4th World Water Forum

The 4th World Water Forum was held on 16-23 March 2006, in Mexico City, Mexico, which is one of the biggest water-related events in the World.

NARBO Chairperson, Dr. Basuki, and some NARBO staff attended the Forum. Dr. Basuki gave a presentation introducing NARBO activity at the session titled "Launching Session for the CSD WAND (Water Action and Networking Database)". In addition, JWA had a booth in the Water Expo, distributing NARBO brochure and exhibiting panels introducing NARBO.



2. The 3rd Asia Pacific Association of Hydrology and Water Resources (APHW) Conference

APHW, established on 1st September 2002, is a membership network to promote in an appropriate framework for the Asia Pacific Region: (i) Exchange of operational knowledge and experience in water resources management, and (ii) Research activities and education. It is also a member of NARBO.

The 3rd APWH Conference was held on 16-18 October 2006, in Bangkok, Thailand. JWA dispatched its one staff, Mr. Minoru Arai, to the Conference, and he gave a presentation introducing NARBO.



3. The 3rd South East Asia Water Forum

The 3rd South East Asia Water Forum was held on 22-26 October 2007, in Kuala Lumpur, Malaysia. On 24 October, Mr. Ivan De Silva, Vice Chairperson of NARBO chaired the session titled “Water Resources and River Basin Management Issues”, as well as gave a presentation “Present State and Future Prospects of NARBO” to introduce the NARBO activity. In the session, 2 staff of JWA, Mr. Yasuhiro Ochii and Mr. Akira Nishimura, also gave presentations on Japanese experiences on water resources management.



4. The symposium on Catalyzing Investment in Asia Pacific Region

See the Brief Report on the Symposium on Catalyzing Investment in Asia Pacific Region.



UNESCO-IHE
Institute for Water Education



PUB
Water for All: Conserve, Value, Enjoy



United Nations Educational,
Scientific and Cultural Organization

Final Version, 22 November 2007

Message from the Regional Consultation Meeting on Developing Knowledge and Lessons

Establishing regional water knowledge hubs will help the countries of the Asia Pacific region in addressing their water management challenges of the 21st century

This message presents summary findings and recommendations from the Regional Consultation Meeting for Candidate Water Knowledge Hubs in the Asia-Pacific Region, hosted by Singapore's Public Utilities Board (PUB Singapore) on 29-31 October 2007 at the Singapore *WaterHub*. The consultation was organized in the context of the Asia Pacific Water Forum's (APWF) Key Result Area 1 activities for developing knowledge and lessons. The meeting was attended by 24 representatives from 13 centers of excellence in the region and beyond.

Key findings of the meeting are:

- 1. The region faces unprecedented challenges in water management.** The Asia Pacific region faces unprecedented challenges in water management in the next two decades because of climate change, urbanization, decentralization, environmental degradation, governance reforms, and other profound changes in society. To address these formidable challenges, the countries in the region need to urgently improve their knowledge generation, sharing, and capacity development for delivering water and sanitation services and managing water resources in river basins.
- 2. A new approach is needed for knowledge partnerships and networking.** The meeting explored a new approach to knowledge partnerships and networking in the Asia Pacific region with the help of *regional water knowledge hubs* that focus on key water sector topics (knowledge domains). In this approach, space is created for countries with advanced expertise and existing centers of excellence in the region to offer their services as a regional water knowledge hub to clients and partners in the region.¹

¹ In modern usage, hubs are known as common connection points in a network, as a central server to which clients connect. In airline travel, hubs connect people to their destination. Hub is also used to refer to a center of excellence and business, as in a financial hub. A knowledge hub can be regarded as connecting people to the best information, analysis, and people. A knowledge hub has a reputation for excellence in delivering products and services to clients. For the purpose of this regional consultation meeting, the concept of regional water knowledge hubs was used to refer to centers of excellence that will deliver the best information, knowledge, and capacity development services in their specific area of focus (their knowledge domain). These domains are priority water sector topics to help the countries in the Asia Pacific region in addressing the formidable water management challenges of the 21st century. (From: Lincklaen Arriens, W. and Luijendijk, J., 2007. *Water knowledge networking – partnering for better results*).

3. **Knowledge hubs can pursue excellence by adopting key operating principles.** For the new approach to work and become self-sustaining, the regional water knowledge hubs will need to demonstrate and maintain excellence in their products and services to meet client needs. Adopting a number of common key operating principles will help to ensure that this happens. Each regional water knowledge hub, working in its knowledge domain, should be able to demonstrate: vision and leadership; a focus on client needs; significant outcomes and impact in the region; an (international) team of experienced specialists; generation and identification of state-of-the art knowledge; a stimulating research environment including internships for younger researchers; relevant and feasible knowledge solutions to address water management challenges in the region; regular comparative analysis across the region; excellent products and services that meet client needs; an inclusive attitude to knowledge networking; dissemination of up-to-date information for the region; an entrepreneurial approach to developing a sustainable business model; and adequate human and financial resources to develop the knowledge hub's excellence.
4. **The water knowledge hubs will collaborate to improve performance.** PUB Singapore and UNESCO are co-leaders of the APWF's Key Result Area 1 on developing knowledge and lessons, and PUB Singapore has offered its *WaterHub* as a regional water knowledge hub for urban water management. The Asian Development Bank and UNESCO-IHE Institute for Water Education have agreed to facilitate the collaboration among regional water knowledge hubs and their networks. The participants of the meeting expressed interest in collaboration among the candidate water knowledge hubs and recommended to establish an APWF Network of Regional Water Knowledge Hubs.
5. **Regular review meetings will provide an efficient governance framework.** The proposed Network of Regional Water Knowledge Hubs will meet regularly to review progress and performance. The Governing Council of the APWF will be invited to the review meetings for providing guidance and to endorse recommendations for follow-up actions. APWF's Secretariat in Japan will be kept informed of meeting results.

Recommendations of the meeting are:

The participants in the meeting call on the Governing Council of the APWF to endorse the following actions in developing knowledge and lessons under the Key Result Area 1:

1. Introducing the new approach of knowledge partnerships and networking in the Asia Pacific region with the help of regional water knowledge hubs that focus on key water sector topics (knowledge domains), allowing for announcements of the candidate hubs and the proposed Network to be made at the 1st Asia Pacific Water Summit on 3-4 December in Beppu, Japan.
2. Recognizing regional water knowledge hubs for priority water sector topics (knowledge domains) based on a review of the development plan to be completed by each of the candidate hubs in the first quarter of 2008.
3. Supporting the establishment of the APWF Network of Regional Water Knowledge Hubs in the first quarter of 2008. Initial Network actions are to (i) develop a website and communications platform for the Network; (ii) develop guidelines for the Network's operation including objectives, principles, activities, results, and governance; and (iii) organize the first Network meeting in Singapore at the end of the 1st quarter of 2008 to review the development plans of candidate hubs and for the Network's operation. The start-up of the Network will be coordinated by a team of staff from PUB Singapore, UNESCO, UNESCO-IHE, and the Asian Development Bank.

Participants in the meeting represented the following organizations:
(Organizations listed in alphabetical order, with their current or proposed role)

Asian Development Bank (ADB), Manila

Facilitator for developing regional water knowledge hubs in the Asia Pacific Water Forum, leader of Asia Pacific Water Forum's Priority Theme 1 on Water Financing and Capacity Development, and of Key Result Area 3 on increasing public outreach, and supporter of several networks of water practitioner organizations in the Asia Pacific region

Commonwealth Scientific and Industrial Research Organization (CSIRO), Canberra

Facilitator for identifying a candidate regional water knowledge hub in Australia (for a knowledge domain to be determined shortly)

International Centre for Water Hazard and Risk Management (ICHARM), Tsukuba

Candidate regional water knowledge hub for disaster risk reduction and flood management, and leader of Asia Pacific Water Forum's Priority Theme 2 on Water-related Disaster Management

International Research and Training Centre on Erosion and Sedimentation (IRTCES), Beijing

Candidate regional water knowledge hub for erosion and sedimentation in river basins

International Water Management Institute (IWMI), Colombo

Candidate regional water knowledge hub for irrigation service reform

Japan Water Agency (JWA), Saitama

Secretariat of the Network of Asian River Basin Organizations, and partner of the candidate regional water knowledge hub for river basin organizations and management (Ministry of Public Works, Indonesia)

National Hydraulic Research Institute of Malaysia (NAHRIM), Ministry of Natural Resources and Environment (MONRE), Kuala Lumpur

Candidate regional water knowledge hub for climate change

Ministry of Public Works (MPW), Jakarta

Candidate regional water knowledge hub for river basin organizations and management (in collaboration with Japan Water Agency as the Secretariat of the Network of Asian River Basin Organizations)

K-Water, Daejeon

Candidate regional water knowledge hub for water quality management in river basins

PUB Singapore

Candidate regional water knowledge hub for urban water management, and co-leader of Asia Pacific Water Forum's Key Result Area 1 on Developing Knowledge and Lessons

Scientific Information Center of the Interstate Commission for Water Coordination (SIC-ICWC), Tashkent

Candidate regional water knowledge hub for water resources management in central Asia

Pacific Islands Applied Geo-science Commission (SOPAC), Suva

Candidate regional water knowledge hub for water services and resource management in the Pacific (Note: SOPAC was unable to participate in the meeting but expressed their support)

3

UNESCO, Paris

Co-leader of Asia Pacific Water Forum's Key Result Area 1 on Developing Knowledge and Lessons (Note: UNESCO helped to prepare for the meeting but was unable to participate)

UNESCO-IHE Institute for Water Education, Delft

Facilitator for developing the Asia Pacific Water Forum Network of Water Knowledge Hubs

Yellow River Conservancy Commission (YRCC), Zhengzhou

Candidate regional water knowledge hub for decision support systems for river basin management (Hydroinformatics)

The participants also recommended establishing regional water knowledge hubs on other priority topics (knowledge domains), including: (i) water governance (being explored, including possible roles by the National University of Singapore and the National University of Malaysia); (ii) sanitation; (iii) water supply for rural areas and small towns; (iv) groundwater management; (v) environment, ecosystems and healthy rivers; and (vi) water and energy.

Participants in the meeting expressed their appreciation to:

PUB Singapore for hosting the regional consultation meeting, and to UNESCO-IHE and the Asian Development Bank for facilitating the meeting.



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3rd General Meeting of NARBO

Surakarta, February 20-22, 2008

3 – New or Withdrawal of NARBO Members

Joining and Withdrawal of NARBO members (as of 18 Feb 2008)

Joining of members 9 Organizations

Category	Country	Organization
RBO	Pakistan	Indus River System Authority
		Outline As a consequence of the Water Apportionment Accord 1991, to implement the Accord, The Indus River System Authority (IRSA) was therefore created in 1993 through an Act of the Parliament to implement and regulate the water in accordance with the stipulations of the Water Accord. IRSA comprises five members, one each to be nominated by each Province and the Federal Government from amongst high ranking Engineers in Irrigation or related engineering fields.
RBO	Thailand	Bang Pakong Prachinburi and Tonlesab River Basin Committee
		Outline Bang Pakong River Basin Committee is a coordinating body for water resources management in the river basin. Its secretariat work is done by the Department of Water Resources' Regional Office 6.
RKP	Japan	Japan Water Resources Association
		Outline Japan Water Resources Association (JAWA) was established in May 1988 as an incorporated foundation authorized by National Land Agency (present Ministry of Land, Infrastructure and Transport) of Japanese government. The aim of JAWA has been promoting the activities for arousing people's interest on water resources and for obtaining the public understandings and cooperation. At the same time we implement the survey, research and technical development on various domestic and international water problems with the cooperation of private consultants, public institutes etc. under the guidance and advice of professors and experts.
RKP	Japan	Graduate School of Management, Kyoto University
		Outline Graduate School of Management, Kyoto University has been established in 2006 jointly by the Graduate School of Economics and the Graduate School of Engineering. This school is aiming at creating new leaders who can solve trans-boundary management issues of current society based on fundamental economics and engineering. This school provides three programs: Project Innovation Management, Project Operation Management and Financial Risk Management.
RKP	Japan	Japan River Restoration Network
		Outline Japan River Restoration Network (JRRN) is one of the domestic organization of Asian River Restoration Network (ARRN) established in 2006 by the concerned agencies in Japan, Korea and China with an aim to exchange knowledge and technical information on river restoration as well as to provide opportunities for groups and individuals to share and exchange their knowledge and experiences in the field, which would enable the participants to improve their knowledge and
RKP	Malaysia	National Hydraulic Research Institute of Malaysia
		Outline The institute is under the Ministry of Natural Resources and Environment Malaysia and its objectives are to implement water/river/coastal R&D program for sustainable national water resources development taking cognizance of environmental consideration AND to provide services as the National Hydraulic Research Centre of Excellence.
IRKP	Australia	International WaterCentre
		Outline International WaterCentre (IWC) is a joint venture between four leading Australian universities: The University of Queensland, Monash University, Griffith University and the University of Western Australia. IWC is a centre for education, training and research committed to building the capacity of water professionals internationally to implement effective integrated water resource management.
IRKP	Japan	The International Centre for Water Hazard and Risk Management
		Outline ICHARM was established in March 2006 under the auspices of UNESCO hosted by the Public Works Research Institute, Japan. The mission of ICHARM is to function as the international centre to provide and assist implementation of best practicable strategies to localities, regions and the globe to manage the risk of water related disasters.
IRKP	People's Republic of China	The International Research and Training Center on Erosion and Sedimentation
		Outline The International Research and Training Center on Erosion and Sedimentation (IRTCES) was jointly set up on July 21, 1984, in Beijing according to the agreement of the Government of China and UNESCO, which was renewed in November 2005. The Ministry of Water Resources is the governmental executive agency. Since its founding, IRTCES has devoted itself to research and training to solve scientific and engineering problems related to erosion and sedimentation.

Withdrawal of members No Organization

List of NARBO Member and Interested to become member

February 18, 2008

Category	Member	(Interested)
River Basin Organization (RBO)	22	4
Government Organization (GOV)	17	4
Regional Knowledge Partner (RKP)	17	1
Inter-Regional Knowledge Partner (IRKP)	8	0
Development Cooperation Agency (DCA)	1	0
Total	65	9

Classification	Country/Region		Organization	Representative/Signatory	Position	
Member	RBO	Indonesia	M	Jasa Tirta I Public Corporation (PJT I)	Mr. Tjoek Walujo Subijanto	President Director
		Indonesia	M	Jasa Tirta II Public Corporation (PJT II)	Mr. Djendam Gurusinga, Dipl.HE	President Director
		Indonesia	M	Jragung-Tuntang Basin Water Resources Management Unit (BWRMU) (Balai PSDA Jragung-Tuntang)	Mr. Tri Widodo D.	Head
		Indonesia	M	Balai Besar Wilayah Sungai Bengawan Solo	Mr. Imam Agus Nugroho	Head
		Indonesia	M	Balai Besar Wilayah Sungai Pompengan Jeneberang	Mr. Bambang Sigit Suryono	Head
		Indonesia	M	River Basin Water Resources Management Unit Pekalan Sampean (PSDA)	Mr. Wahjoe Pribowo	Head of PSAWS
		Indonesia	M	Balai Pengelolaan Sumber Daya Air Ciujung-Ciliman Banten (BPSDA)	Mr. Winarjono	Head of DPU
		Indonesia	M	Sermo Water Resources Management Unit (BPSDA)	Mr. Purwoko	Head
		Indonesia	M	River Basin Water Resources Management Unit Citarum (PSDA)	Mr. Rustam Suharman	
		Japan	P	Japan Water Agency (JWA)	Mr. Toshiki Aoyama	President
		Korea	M	Korean Water Resources Corporation (K water)	Dr. Ko Ich Hwan	Director, Hydrosystem Engineering Center
		Laos	M	Nam Ngum River Basin Development Sector Project	Mr. Thatheva Saphangthong	Coordinator, Integrated Watershed Management Unit
		Malaysia	M	Selangor Water Management Authority (SWMA)	Mr. Azizah Binti Yusof	Acting Director
		Pakistan	M	Indus River System Authority (IRSA)	Mr. Fida Hussain	Senior Engineer
		Philippines	M	Laguna Lake Development Authority (LLDA)	Ms. Dolora Nepomuceno	Assistant General Manager
		Sri Lanka	M	Mahaweli Authority of Sri Lanka (MASL)	Mr. K. W. Ivan de Silva	Director General
		Thailand	M	Bang Pakong River Basin Committee (BPRBC)	Mr. Pathai Punturothai	Director, Division of Coordination and Management
		Viet Nam	M	Cuu Long & Dong Nai River Basin Organization	Mr. To Van Truong	Chief of Office
		Viet Nam	M	Red River Basin Organization	Dr. To Trung Nghia	Chief of Office
		Viet Nam	M	Day River Basin Organization	Mr. Le Duc Nam	Deputy Director of DWR, MARD
Viet Nam	M	Vu Gia Thubon River Basin Organization	Mr. Nguyen Van Sinh	Chief of GORBO's Secretariat Board		
Southeast Asia	M	Mekong River Commission Secretariat	Dr. Oliver Cogels	Chief Executive Officer		

Classification	Country/Region		Organization	Representative/Signatory	Position	
Member	GOV	Bangladesh	M	Bangladesh Water Development Board (BWDB)	Mr. H. S. Mozaddad Faruque	Director General
		Bangladesh	M	Local Government Engineering Department, Ministry of Local Government, Rural Development and Cooperatives	Mr. Md. Shahidul Hasan	Chief Engineer
		Cambodia	M	Ministry of Water Resources and Meteorology	Dr. Theng Tara	Director, Department of Water Resources Management and Conservation
		Cambodia	M	Department of Hydrology and River Works	Mr. Long Saravuth	Deputy Director
		Indonesia	M	Directorate General of Water Resources	Mr. Imam Anshori	Director of Water Resources Management
		Indonesia	M	Water Resources Development, West Nusa Tenggara Province	Mr. Djalal	Chief
		Japan	M	Water Resources Department, Land and Water Bureau, Ministry of Land, Infrastructure & Transport	Mr. Kunihiro Moriyasu	Deputy Director
		Laos	M	Water Resources Coordination Committee Secretariat	Mr. Phonechaleun Nonthaxay	Director General

	Malaysia	M	Department of Irrigation and Drainage (DID Malaysia)	Mr. Datuk. Keizrul Abdullah	Director General
	Philippines	M	National Water Resources Board	Mr. Ramon Alikpala	Executive Director
	Philippines	M	Department of Environment and Natural Resources	Ms. Analiza R. Teh	Assistant Secretary, Foreign Assisted & Special Project Office
	Sri Lanka	M	National Water Resources Authority	Mr. Ananda. H. Jayaweera	Director
	Thailand	M	Department of Water Resources, Ministry of Natural Resources and Environment	Mr. Siripong Hungspreug	Director General, Department of Water Resources
	Viet Nam	M	Department of Water Resources Management, MONRE (General Office for RBO, WRD, MARD)	Mr. Le Duc Nam	Deputy director of DWR, MARD
	Viet Nam	M	General Office for RBOs in Viet Nam	Dr. Su Pham Xuan	General Director
	Viet Nam	M	Southern Institute for Water Resources Planning, (SIWRP), Ministry of Agriculture & Rrural Development	Mr. Nguyen Xuan Hien	Deputy Director
	Viet Nam	M	Department of Natural Resources and Environment of Dong Nai Province	Mr. Phan Van Het	Vice Director

Classification	Country/Region		Organization	Representative/Signatory	Position		
Member	RKP	South East Asia	M	Global Water Partnership (GWP) SEA RWP	Mr. Siswoko Sastrodihardjo	Chairperson	
		South Asia	M	Global Water Partnership (GWP) SAS RWP	Mr. Suresh Prabhu	Regional Chairperson	
		South Asia	M	South Asia Network of River Basin Organization (SASNET-RBO)	Mr. Don Clement Sudharma Elakanda	Network Coordinator SASNET-RBO	
		South Asia	M	The Capacity Building Network for Integrated Water Resources Management South Asia (CapNet SA)	Dr. Jasveen Jairath	Regional Coordinator	
		Bangladesh	M	Institute of Water Modeling (IWM)	Mr. Emaduddin Ahmad	Executive Director	
		Indonesia	M	Indonesia Water Partnership	Mr. Achmadi Partowijoto	Member of Trustee	
		Indonesia	M	The Foundation on Water Affairs ADHI EKA	Mr. Kusdaryono Sutosuromo	Chairman of the Executive Board	
		Indonesia	M	Faculty of Engineering, Brawijaya University	Dr. Agus Suharyanto	Vice Dean for Academic Affairs	
		Indonesia	M	Research Centre for Water Resources	Dr. Arie Setiadi	Head	
		Indonesia	M	Center for Environment & Civil Engineering Research	Dr. Indreswari Guritno	Head of the Water Resources & coastal engineering science group	
		Indonesia	M	Post Graduate Study on Water Resources Management Faculty of Engineering Gadjah Muda University	Dr. Budi Wignyosukarto	Senior Lecturer	
		Indonesia	M	SEMBRANI foundation	Mr. Mardjono Notodiharjono	Chairman	
		Japan	M	JAWA - Japan Water Resources Association	Dr. Toru Kondo	President Director	
		Japan	M	Japan River Restoration Network (JRRN)	Dr. Nobuyuki TAMAI	Chairperson	
		Japan	M	Graduate School of Management, Kyoto University	Dr. Kazuo YOSHIDA	Dean	
		Malaysia	M	National Hydraulic Research Institute of Malaysia (NAHRIM)	Dr. Salmah Zakaria	Director	
		Thailand	M	Thailand Water Resources Association (TWRA)	Dr. Apichart Anukularmphai	President	
		IRKP	Inter-region	P	Asian Development Bank Institute (ADBI)	Mr. Peter Mc. Cawley	Dean
			Inter-region	M	Asia Pacific Association of Hydrology and Water Resources (APHW)	Dr. Katsumi MUSHIAKE	Secretary General
			Inter-region	M	International Centre for Water Hazard and Risk Management (ICHARM)	Dr. Kuniyoshi TAKEUCHI	Director
Inter-region	M		International Research and Training Center on Erosion and Sedimenttion (IRTCES)	Dr. Prof. Hu Chunhong	Secretary General		
Inter-region	M		IUCN - The World Conservation Union	Dr. John Dore	Leader, Asia Water & wetlands Program		
Inter-region	M		International Water Centre (IWC)	Mr. Mark Pascoe	Chief Executive Officer		
Inter-region	M		International Water Management Institute (IWMI)	Mr. Andrew Noble	Head IWMI-SEA		
Inter-region	M		The World Wildlife Fund International (WWF International)	Dr. Isabella Louis	Director, Asia Pacific Region		
DCA	Inter-region	P	Asian Development Bank (ADB)	Mr. Jan P. M. van Heeswijk	Director General		

Classification	Country/Region		Organization	Representative	Position	
Interested	RBO	Indonesia	I	Balai Besar Wilayah Sungai Brantas	Ir. Sugianto, M. Eng	Head
		Indonesia	I	Balai Besar Wilayah Sungai Mesuji Sekampung	Ir. Hartanto, Dipl. HE	Head
		Pakistan	I	Water and Power Development Authority	Mr. M Mushtaq Chaudhry	General Manager (P&D)
		Thailand	I	Ping River Basin Committee	Ms. Supaporn Thongpook	President & Coordinator
	GOV	Bangladesh	I	Joint River Commision	Mr. Mir Sajjad Hossain	Director
		China	I	Haihe River Water Resources Commission, Ministry of Water Resources	Mr. Liu Chang Zhong	Senior Engineer
		China	I	Taihu Basin Authority, Ministry of Water Resources	Mr. Gong Zheng	Engineer
		China	I	Yellow River Conservancy Commission, Ministry of Water Resources	Mr. Sun Yangbo	Deputy Director, Division of International Cooperation
	RKP	Japan	I	Ritsumeikan Asia Pacific University	Dr. Fransisco P. Fellizar, Jr	Associate Professor

Note:

P = Promotor (Member)
M = Member

I = Interested to become a member

3rd General Meeting of NARBO

Surakarta, February 20-22, 2008

4 – Proposal of Revision of NARBO Charter

Network of Asian River Basin Organizations (NARBO)

CHARTER

February 2004
(Revised February 2006)
(Revised February 2008)

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Introduction

The world community has recognized the importance of managing water resources in a more integrated manner. Over the past decades, a series of regional and global water conferences, including the World Water Forums in 1997, 2000, and 2003, have underlined the need to adopt and operationalize the approach of integrated water resources management (IWRM), which is defined by the Global Water Partnership as “a process to improve the planning, conservation, development, and management of water, forest, land, and aquatic resources in a river basin context, to maximize economic benefits and social welfare in an equitable manner without compromising the sustainability of vital environmental systems.”

By focusing on the management of water and related resources in a river basin context, it is implied that IWRM will be undertaken at basin level with the involvement of stakeholders at the basin level. The water conference in Dublin in 1992 referred to the need to manage water resources at the lowest appropriate level. This has become one of the basic principles underpinning the IWRM approach, and it has led to increased recognition that river basin organizations (RBOs) can realize IWRM at the basin level. Since Dublin, the world community has also recognized the importance of promoting gender and development work as part of the IWRM approach to ensure that women participate in water management at all levels.

Many forms of RBOs have been established in recent decades, and countries have developed various governance approaches for RBOs, for example, river basin commissions in the People’s Republic of China, river basin parliaments in France, river basin committees in Australia, river basin authorities in the United States and Sri Lanka, a lake basin development authority in the Philippines, water resources public corporations in Japan and Indonesia, inter-state RBOs like the river basin tribunals in India and the Murray-Darling Basin Commission in Australia, and international RBOs in the Mekong basin, the Syr and Amu Darya basins, and in the Tumen basin.

Some RBOs were established decades ago and have ceased to exist, while many new RBOs have been established recently. Some RBOs have a large

technical capacity, employing thousands of staff, while others may employ just a handful, like the newly established river basin committees in Southeast Asia. While there are many differences between these RBOs, they share a common mission, which is to operationalize IWRM in their respective river basins.

A network to assist RBOs in Asia in their work of introducing and operationalizing the IWRM approach does not yet exist. Consequently, RBOs lack opportunities for exchanging information and experience on their operations, and access for their staff to training and capacity building that draws on the technical and non-technical experience in managing water resources in Asia.

The need for partnerships for action to achieve IWRM was recognized at the 3rd World Water Forum held in Kyoto, Osaka, and Shiga, in the Lake Biwa and Yodo River Basin, Japan, in March 2003, where it was noted that several developed and developing countries in Asia have already established RBOs to implement IWRM. The 3rd World Water Forum highlighted the need to support these RBOs through knowledge sharing and capacity building, especially in developing countries.

The 3rd World Water Forum also emphasized the contributions that IWRM can make to improve the water security of the poor, by incorporating the needs of the poor explicitly in water policies and management practices at all levels.

Recognizing the need for networking and capacity building in the implementation of IWRM, the Water Resources Development Public Corporation of Japan (recently reconstituted as the Japan Water Agency), the Asian Development Bank, and the Asian Development Bank Institute decided at the 3rd World Water Forum in March 2003 in Kyoto, Japan, to collaborate in launching a Network of Asian River Basin Organizations (NARBO), and a letter of intent was signed at the Forum on 21 March 2003.

Note: This Charter is intended to guide NARBO in its start-up phase, during which membership by RBOs and partner organizations will be promoted and initial activities started to meet immediate needs of RBOs for training and exchange of information and experience. It is expected that the Charter will be reviewed and revised by the NARBO General Meeting when membership has

grown, a program of activities is agreed and under implementation, and membership fees can be introduced.

Section 1. Denomination and Working Language

- (1) This new initiative is entitled the Network of Asian River Basin Organizations (hereafter NARBO).
- (2) The language to be used is English.

Section 2. Goal and Objective

The goal of NARBO will be to help achieve IWRM in river basins throughout Asia.

NARBO's objective will be to strengthen the capacity and effectiveness of RBOs in promoting IWRM and improving water governance, through training and the exchange of information and experience among RBOs and their associated water sector agencies and knowledge partner organizations in Asia and to advise on the establishment of RBOs in Asia.

Section 3. Activities

To promote IWRM in Asia, the focus of NARBO's activities will be as follows:

(1) Activities for the whole of NARBO

The activities joined by all members of NARBO will be as follows:

- (a) Advocacy and raising awareness for IWRM among RBOs, water sector apex bodies, and leading water sector agencies in the region, mainly through regional workshops.
- (b) Sharing of information, good practices, and lessons learned for IWRM among the participating organizations, mainly by operating

databases and a website for IWRM exchanging information, and by sending a newsletter by email as well as posting on the web site and holding (sub) regional workshops.

(2) Activities for regional areas of NARBO

RBOs, national and federal governmental organizations with expertise in IWRM, regional and interregional knowledge partner organizations for IWRM, and bilateral and multilateral development cooperation agencies, will be requested to support RBOs in Asia in the following types of activities.

(a) Supporting NARBO members to improve water governance, including the enabling policy, institutional, and legal framework for IWRM, and the formulation of the action plans.

(b) Building capacity of RBOs in implementing IWRM, mainly through staff exchange and training among participating organizations.

(c) Supporting RBOs with technical advice in regard to the planning, conservation, development, and the proper and efficient operation and maintenance of water resources facilities, to improve IWRM.

(d) Fostering regional cooperation for improved management of water resources in transboundary river basins.

(3) The scope of IWRM activities to be supported by NARBO will be approved by the NARBO General Meeting.

(4) NARBO's activities will initially focus on the monsoonal areas of Asia.

Section 4. Organizations

Article 4.1. Membership

(1) Membership will be open to the following types of organizations.

- (a) RBOs, defined as organizations that have been officially recognized by the government of their country as having a mandate to promote and implement IWRM at the river basin level.
- (b) National and federal/ provincial / local governmental organizations in charge of water administration in the countries which implement or are interested in promoting and implementing IWRM at the level of river basins. This includes water sector apex bodies and leading water agencies.
- (c) Regional knowledge partner organizations with expertise in promoting and supporting IWRM, such as international RBOs and research and training organizations.
- (d) Inter-regional knowledge partner organizations with expertise in promoting and supporting IWRM.
- (e) Bilateral and multilateral development cooperation agencies promoting and supporting activities related to IWRM at the level of river basins.

(2) Among these, the organizations under (1.a) are considered as RBO members and (1.b to 1.e) are considered as partner members. Partner members will participate in NARBO as promoters and supporters of IWRM and RBOs, and as knowledge partners to RBOs.

(3) If other organizations wish to join NARBO, it needs to be recommended by an existing NARBO member or government agency concerned, notified to the Secretary General (see “Article 4.4.”) and approved in the NARBO General Meeting (see “Article 4.2.”).

Note: (1.c) and (1.d) include regional and inter-regional nongovernment organizations (NGOs) with expertise in promoting and supporting IWRM. For participation of national NGOs, (3) will apply. Participation as an observer in NARBO General Meetings is also possible (See “Article 4.2 (2)”).

(4) Application for membership in NARBO

- (a) An application to join NARBO should be submitted to the Secretary General with a recommendation from a NARBO member or the government.
- (b) The Secretary General evaluates the application and confers with the Chairperson and the Vice-Chairperson with his/her comments.
- (c) The Chairperson makes the final decision.
- (d) The Secretary General notifies the result to the applicant organization.
- (e) When the applicant receives the approval, the applicant organization becomes the member.
- (f) The new member is introduced to the NARBO members.

(5) Withdrawal from NARBO

- (a) The following are grounds for a member to cease to be a NARBO member:
 - (i) The member applies for withdrawal from NARBO membership;
 - (ii) The member organization is abolished; and
 - (iii) The member organization undertakes activities contradictory to the principles of NARBO.
- (b) When a member matches to one of these grounds, the Secretary General evaluates the ground and confers with the Chairperson and the Vice-Chairperson with his/her comments.
- (c) The Chairperson makes the final decision.

(d) The Secretary General notifies the result to that organization.

(6) Member's obligation

- (a) Members will participate in NARBO activities of their interest with commitment to use their own resources and to work effectively in partnership with other organizations that are collaborating in the network. Members will support the objectives of NARBO and will comply with its rules and regulations.
- (b) RBO members are obliged to submit an annual report to the Secretary General once a year with in 3(three) months after their yearly fiscal year, in which its plan, scope of action, major activities, and issues are summarized. The report will be submitted in English.
- (c) The NARBO members are required to pay an annual membership fee. The amount and schedule of payment will be approved by NARBO General Meeting.

Note: For the time being, no membership fees are being considered.

Article4.2. NARBO General Meeting

(1) Venue and Date

- (a) The NARBO General Meeting is held, in principle, every two years.
- (b) In principle, the General Meeting is held in the Chairperson's country, except as otherwise determined by the Chairperson. The dates are proposed jointly by the Chairperson and the Secretary General.
- (c) An extraordinary NARBO General Meeting can be convened at the request of the Chairperson, Vice-Chairperson, Secretary General or NARBO Secretariat before the next General Meeting, if there is a specific reason or if there are important issues to be solved urgently.

ii) The decision of the venue and date is the same as the decision for a General Meeting.

(d) The venue, date and agenda of General Meeting shall be distributed with an appropriate advance notice.

(2) Participation

Members, technical advisory committee members, and observers may attend the NARBO General Meeting. Observers need endorsement from the NARBO Secretariat and the local organizing committee hosting the NARBO General Meeting.

(3) Agenda of the NARBO General Meeting

(a) Two year action report and future action program of NARBO

(b) Reports by members on matters related to activities of NARBO

(c) Selection and replacement of Chairperson, Vice-Chairperson, Secretary General and Vice-Secretary Generals

(d) Approval and revision of the Charter

~~(e) Approval of new members, or their withdrawal~~

(4) Approval

The approval of the NARBO General Meeting is based on consensus between the attending members.

Article4.3. Chairperson and Vice-Chairperson

(1) Nomination and Selection of the Chairperson and the Vice-Chairperson

(a) The Chairperson and the Vice-Chairperson are nominated by the Secretariat and selected by the NARBO General Meeting.

(b) In case the Chairperson is or becomes unable to perform his / her function as Chairperson, the Vice-Chairperson will exercise the function and responsibility of the Chairperson until a Chairperson is selected at the next NARBO General Meeting.

(c) The Chairperson will be deemed to be unable to perform his/her function as Chairperson if (i) The Chairperson declares that he/she is unable to perform his/her function as Chairperson; or (ii) The Secretariat recognizes that the Chairperson is unable to perform his/her function as Chairperson.

(d) In case the Vice-Chairperson is or becomes unable to perform his/her function as Vice-Chairperson, an Acting Vice-Chairperson is nominated by the Secretariat and appointed by the Chairperson for a period extending until a Vice-Chairperson is selected at the next NARBO General Meeting.

(e) The Vice-Chairperson will be deemed to be unable to perform his/her function as Vice-Chairperson if (i) The Vice-Chairperson declares that he/she is unable to perform his/her function as Vice-Chairperson; or (ii) The Secretariat recognizes that the Vice-Chairperson is unable to perform his/her function as Vice-Chairperson.

(2) Responsibility of Chairperson

The Chairperson leads the NARBO General Meeting and guides NARBO activities until the next General Meeting.

(3) Responsibility of Vice-Chairperson

(a) Assist the Chairperson

(b) Substitutes for the Chairperson when he/she is not available

(4) NARBO Senior Adviser

(a) Secretary General may invite the Chairperson to become NARBO Senior Adviser at the completion of Chairpersons term. A NARBO Senior Adviser is expected to advise the Chairperson and Secretariat in promoting and enhancing NARBO activities ~~at the request of the Chairperson and/or Secretary General.~~

(b) A NARBO Senior Advisor is expected to serve for a period of 2 years, with possible extension.

Article 4.4. Secretariat

(1) Responsibilities of the NARBO Secretariat

(a) Initiatives and Activities of NARBO

(i) Collection of relevant information and coordination with related organizations, including participation in relevant meetings

(ii) Preparation of the documents needed for and writing reports of the NARBO General Meeting

(iii) Preparation of two-year action report and action program

(iv) Operation and management of the NARBO web site and other communication facilities

(v) Advice on the enabling policy, institutions and efficient operation to improve IWRM and on the establishment and capacity building of RBOs in implementing IWRM (subject to available resources of NARBO to provide advice through cost-effective means)

(vi) Organization of other NARBO initiatives and activities

(b) Logistics Service for NARBO

(i) Contacts and coordinates the members

- (ii) Handles the administration, including registration of members, accounting, document preparation etc.

(2) Composition and Location of the NARBO Secretariat

(a) The NARBO Secretariat is composed of the Japan Water Agency (JWA), the Asian Development Bank Institute (ADBI), both in Japan, and the Asian Development Bank (ADB), in Philippines.

(b) The Headquarters of the Secretariat is located in JWA and its branches are located in ADBI and ADB. Secretariat staff are nominated by the Secretary General in consultation with JWA, ADBI and ADB.

(c) Any organization in the NARBO Secretariat may resign its function at any time without condition.

(3) Nomination and approval of the Secretary General and the Vice-Secretary Generals.

(a) The Secretary General and the Vice-Secretary Generals are nominated by the Secretariat and approved at the NARBO General Meeting.

(b) In case the Secretary General or any Vice-Secretary Generals is or becomes unable to perform his/her function, an Acting Secretary General or an Acting Vice-Secretary General, as the case may be, is nominated by the Secretariat and appointed by the Chairperson for a period extending until the Secretary General or the Vice-Secretary General is selected at the next NARBO General Meeting.

(c) The Secretary General or a Vice-Secretary General will be deemed to be unable to perform his/her function if (i) he/she declares that he/she is unable to perform his/her function as

the Secretary General or the Vice-Secretary General; or (ii) The Secretariat recognizes that the Secretary General or such Vice-Secretary General is unable to perform his/her function as the Secretary General or the Vice-Secretary General.

(4) Responsibilities of the Secretary General

- (a) Initiates and manages NARBO's initiatives and activities.
- (b) Convenes the NARBO Meeting and sets its agenda in consultation with the Chairperson
- (c) Supervises the Secretariat's work

(5) Responsibilities of the Vice-Secretary Generals

- (a) Supports the Secretary General
- (b) Substitutes for the Secretary General when necessary

Article 4.5. NARBO Patron

The Chairperson may invite a person of high public stature and influence to take on the role of NARBO Patron. A NARBO Patron is expected to represent and promote NARBO and its objectives and activities in the region and world, specifically to leaders, policy makers, media, and the general public. The patron may also be requested to advise NARBO on its work.

Article 4.56. Technical Advisory Committee

- (1) A Technical Advisory Committee may be convened by the Secretary General. The Committee will be composed of individuals and organizations who can advise and support NARBO in its activities. Its task is to extend the financial and the technical support for the implementation of regional activities of NARBO.

- (2) The statute of the committee will be approved by the NARBO General Meeting.

Section 5. Resources

- (1) Financial and human resources to support NARBO activities will be provided from the following sources:
- (2) The Members of NARBO will voluntarily provide resources in cash and kind to support NARBO activities in which they are interested to participate.
- (3) Costs (personnel and traveling expenses) of the NARBO Secretariat will be provided by JWA, ADB, and ADBI who will mobilize financial resources for this purpose. Travel expenses for the Chairperson and Vice-Chairperson will be provided by JWA for travel approved by JWA.
- (4) NARBO activities will be financed by JWA, ADBI, ADB, bilateral and multilateral agencies to be identified, and NARBO Members, on a parallel co-financing basis.
- (5) ADB may be requested by the NARBO General Meeting to convene a NARBO Financial Support Group of interested bilateral and multilateral organizations to help support NARBO activities.

Comments:

4.2 (3)(e)...eliminated

This doesn't agree with 4.1 (4) Application for membership in NARBO. Since a new member is approved by the chairperson, agenda of General Meeting doesn't need to include this thing.

4.3 (4)...added

NARBO secretariat suggested setting a senior adviser in NARBO who can advise the Chairperson and Secretariat in promoting and enhancing NARBO activities.

On the basis of an opinion from the floor at the Meeting, the secretariat eliminated the last phrase.

4.5...added

NARBO secretariat suggested setting a patron in NARBO in order to represent and promote NARBO and its objectives and activities in the region and world.

3rd General Meeting of NARBO
Surakarta, February 20-22, 2008

5 – Action Plan for 2008-2009

Preparation of Guidelines for IWRM at River Basin Level

Background

We discussed and finalized a report paper, which is summarized as follows in 1st Water Summit in Beppu.

1. NARBO continues to support governments and RBOs in improving the enabling environment for IWRM, including policies, legislation, institutional development, and public awareness and participation. Also, NARBO continues to facilitate the sharing of knowledge and experiences in the development and management of water resources, in priority topics such as water rights, disaster management, water quality management, and climate change adaptation.
2. NARBO will elaborate the practical guideline for implementing IWRM in Asia monsoon region in collaboration with existing NARBO members, in time for the fifth World Water Forum in March 2009, Turkey.
3. NARBO will prepare a long-term plan for introduction of IWRM in river basins across the region.

Operation (draft)

NARBO will propel the project and obtain the followings in collaboration with UNESCO and INBO.

1. Consolidate the concept of IWRM at river basin level
2. Prepare the practical Guideline
3. Present the Guideline in 5th WWF in Turkey
4. Publish and disseminate the Guideline

Network of Asian River Basin Organizations (NARBO)

ACTION PLAN 2008-2009

Key Result Areas:

- A. Advocacy, Raising Awareness, and Exchange of Information and Good Practices on Integrated Water Resources Management (IWRM)
- B. Capacity Building in River Basin Organizations (RBOs)
- C. Network Support

A. Advocacy, Raising Awareness, and Exchange of Information and Good Practices on IWRM				
Activity	Remarks	Implementation Plan	Lead Agency	Note
<p>Activities led by the NARBO Secretariat (JWA, ADBI, ADB):</p> <p>1. NARBO Website (http://www.narbo.jp)</p> <ul style="list-style-type: none"> • Provide information, news and reminders on NARBO activities • Provide information on introducing IWRM in river basins in Asia, including publications, case studies, articles on important IWRM topics • Link to NARBO member websites, e-newsletters, online databases, and other related sites 	<p>Managed by JWA in collaboration with ADB and ADBI and with input from NARBO members</p>	<ul style="list-style-type: none"> • Continue regular updates • Introduce on-line forum to enhance information and knowledge sharing 	JWA	<p>Members are encouraged to provide stories, cases, articles, and links</p>
<p>2. NARBO e-Newsletter</p> <p>Share good practices, lessons learned, IWRM-related activities, etc.</p>	<p>Prepared quarterly by JWA and distributed through e-mail and the website</p>	<p>Prepare stories and materials on priority topics of interest to NARBO members</p>	JWA	<p>Members are encouraged to send in contributions</p>

<p>3. Guidelines and Online data base Provide guidelines and other useful reference materials on IWRM practices, cases, lessons learned, champions, standards and manuals, annual reports, topics of interest</p>	<p>Managed by JWA, ADBI, and ADB through website and CDs</p>	<p>Formulate guidelines and continue collecting and updating information from members and partners</p>	<p>ADBI, JWA, Knowledge Hub</p>	<p>Members are encouraged to provide materials</p>
<p>4. NARBO Annual Report Summarize NARBO's activities and results annually</p>	<p>Prepared by JWA with inputs from members, and distributed through hardcopies and the website</p>	<p>Distribute annual report in May of following year</p>	<p>JWA</p>	<p>Members to submit their annual reports no later than end March</p>
<p>5. NARBO Promotion</p> <ul style="list-style-type: none"> • Increase governments, public, and media interest in NARBO activities and increase NARBO membership • Disseminate key messages on introducing IWRM in river basins and RBO work • Promote NARBO's objectives and activities 	<p>Managed by JWA and ADB</p>	<ul style="list-style-type: none"> • Promote NARBO work through media, country visits, regional events, and knowledge networks • Invite RBOs in development projects to join NARBO • Invite knowledge partner organizations to join NARBO • Encourage national NARBO networks in countries with many RBOs 	<p>JWA, ADB, Chair, NARBO Indonesia</p>	<p>Members are encouraged to contribute to the promotion and dissemination work, and to increase NARBO membership. NARBO Indonesia to pilot country RBO network.</p>
<p>6. NARBO General Meeting Organize every two years, including study visit in host river basin, IWRM workshops, and general meeting</p>	<p>Managed by JWA, ADBI, and ADB in collaboration with the host RBO</p>	<p>Organize the 4th NARBO General Meeting in the 1st quarter of 2010</p>	<p>Chair, Vice-Chair, NARBO Secretariat</p>	<p>Members are encouraged to participate and share their knowledge</p>
<p>7. Knowledge Networking Facilitate and support regional water knowledge hubs under the Asia-Pacific</p>	<p>Managed by ADB and JWA</p>	<ul style="list-style-type: none"> • Support the new regional knowledge hub on river basin 	<p>ADB, JWA, Knowledge</p>	<p>ADB and JICA TA projects to</p>

<p>Water Forum</p>		<p>organizations and management in Indonesia in developing knowledge products and services for government and RBO clients in the region</p> <ul style="list-style-type: none"> • Pilot a Roadmap Advisory Service to help RBOs prepare long-term IWRM investment programs • Chart and analyze regional progress of introducing IWRM in river basins • Collaborate with the other APWF regional water knowledge hubs on IWRM in river basins • Enhance dissemination of IWRM experience in basins within Indonesia through new dissemination unit (by JICA) 	<p>Hub , JICA</p>	<p>support the knowledge hub are expected to start in 2nd quarter of 2008. Other donors to be encouraged to provide complementary assistance. Involve ICHARM, K-Water, YRCC, NAHRIM, IRTCES and other hubs in collaboration.</p>
<p>Activities led by NARBO Member Organizations:</p> <p>1. NARBO members' websites Develop and maintain websites with useful information and knowledge products on introducing IWRM in their respective river basins</p>	<p>Managed by member RBOs</p>	<p>Develop, maintain, and update the website on a regular basis</p>	<p>Members</p>	<p>Members to develop and maintain modern websites</p>
<p>2. NARBO members' Annual Report Prepare annual report with overview of RBO's objectives, targets, activities, lessons learned, and performance improvements in introducing IWRM in their respective river basins</p>	<p>Prepared by NARBO members annually, and sent to NARBO Secretariat at JWA no later than March of the following year</p>	<p>Prepare annual report and send to NARBO Secretariat</p>	<p>Members</p>	<p>Members are encouraged to invest in useful annual reports</p>

B. Capacity Building in River Basin Organizations (RBOs)

Activity	Remarks	Implementation Plan	Lead Agency	Note
<p>Activities led by the NARBO Secretariat:</p> <p>1. IWRM Training Program Develop the capacity of NARBO member staff in understanding and implementing IWRM in their respective river basins</p>	<ul style="list-style-type: none"> Managed by NARBO Secretariat Conducted once or twice a year 	<ul style="list-style-type: none"> NARBO Technical Advisory Committee to guide an overhaul of the program design Redesigned program to be conducted in 4th quarter 2008 	<p>JWA, ADB, ADBI, Technical Advisory Committee, Knowledge Hub</p>	<p>Members to facilitate their staff to apply and contribute and contribute registration fee</p>
<p>2. Workshops</p> <ul style="list-style-type: none"> Organize IWRM workshops on topics of interest during the NARBO general meeting Organize thematic workshop series, based on demand, to deepen understanding on priority topics 	<p>Lessons learned from thematic workshops on water rights, facility management and disaster management will be used in designing the subsequent workshop series</p>	<ul style="list-style-type: none"> Conduct 4th workshop on Sustainable management for Water Resources Infrastructure in 1st qtr 2008 Conduct 2nd workshop on disaster management by 2nd qtr 2008, and others tbd Conduct workshop on Climate Change Adaptation by NARBO Indonesia and Regional Water Knowledge Hub 	<p>JWA, ADB, ADBI, NARBO Indonesia, Knowledge Hub</p>	<p>Members to attend and contribute knowledge on issues and solution strategies</p>
<p>3. Performance Benchmarking supported by peer reviews</p> <ul style="list-style-type: none"> Provide a demand-based performance benchmarking service for RBOs to assess and improve their performance Introduce a river basin performance benchmarking methodology 	<p>Managed by ADB and IWMI, with IWMI providing training and certification service for peer reviewers, facilitation of peer reviews, and support for pilot-testing of basin benchmarking methodology, in collaboration with the Knowledge Hub</p>	<ul style="list-style-type: none"> Expand implementation of RBO performance benchmarking based on experience gained in pilot phase, to X RBOs Conduct pilot test of river basin performance benchmarking in X river basins 	<p>ADB, IWMI, Knowledge Hub</p>	<p>Number of participating RBOs and basins to be determined during 3rd NARBO GM</p>
<p>4. Advisory visits to RBOs</p>			<p>JWA,</p>	

<ul style="list-style-type: none"> Visit RBOs to learn from their experience in implementing IWRM, and promote knowledge generation and sharing 	Where possible linked to RBO exchange visits initiated by members	Continue and enhance benefits from such visits, with feedback received during 3 rd NARBO General Meeting	ADB, Chair, Knowledge Hub	Knowledge Hub to join visits for piloting Roadmap Advisory Service for RBOs
<p>5. Scholarship Programs</p> <p>Explore opportunities for member RBO staff to join existing scholarship programs for IWRM courses</p>	By JWA, ADBI, ADB and knowledge partner members	Share information on IWRM courses and existing scholarship programs, through NARBO website	JWA, ADB, ADBI	Including online distance learning programs
<p>Activities led by NARBO Member Organizations:</p> <p>1. Regional Water Knowledge Hubs under APWF</p> <p>Provide demand-based knowledge and capacity development services that meet NARBO member clients needs</p>	By concerned APWF regional water knowledge hubs, each of which will develop a network of clients and partners on their topic (knowledge domain)	Member RBOs to explore developing client and partner relationships with relevant APWF hubs for specific services they need	Members, APWF Knowledge Hubs	Use development project budgets to pay for services provided by the hubs
<p>2. Twinning Programs</p> <p>Organize mutually beneficial programs for knowledge sharing and capacity development, involving exchange visits, staff exchange, and joint projects</p>	Initiated, arranged and financed by RBO members themselves	Explore further programs based on member interest, and learning lessons from existing programs between RBOs from Indonesia and JWA and K-Water	Members	NARBO Secretariat can facilitate initial contacts
<p>3. ISO certification</p> <p>Explore opportunities to gain ISO certification for good performance in achieving standards of excellence</p>	Members to exchange information and experience	ISO certified member RBOs in Indonesia (PJT 1 and 2) can provide information to other members	Members, PJT 1, 2	NARBO Secretariat can post information on the website

<p>4. Transboundary Water Management Explore opportunities to foster transboundary water resources management (within and between countries) through information sharing and exchange of experience</p>	<p>To be conducted by interested member RBOs and riparian authorities who jointly agree to explore such collaboration</p>	<p>Contribute good practice cases as inputs for regional study on charting progress in IWRM in river basins in the region</p>	<p>Members, Knowledge Hub</p>	<p>The Mekong River Commission Secretariat has been approached as candidate APWF regional knowledge hub for this topic</p>
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C. Network Support

Activity	Remarks	Implementation Plan	Lead Agency	Note
<p>1. Technical Advisory Committee</p> <p>Provide guidance to ensure quality of NARBO's IWRM Training Program, and on strategic direction of NARBO's activities</p>	<p>Guidelines for the TAC to be finalized in 2008</p>	<p>TAC to be established in 2nd quarter of 2008 to guide the overhaul of NARBO's IWRM Training Program</p>	<p>ADB, ADBI, JWA, Chair</p>	<p>Heads of regional water knowledge hubs to be involved</p>
<p>2. Charting Progress and Facilitating Investment for IWRM</p> <p>Catalyze further investments in IWRM and demonstrate good practices in introducing IWRM in river basins across the region</p>	<p>Regional TA project formulated by ADB to help member RBOs</p>	<p>Implement TA project through regional water knowledge hub in Indonesia over period 2008-2010</p>	<p>ADB, Knowledge Hub</p>	<p>Update to be provided to 3rd NARBO General Meeting</p>
<p>3. Collaboration with International Networks</p> <p>Collaborate with GWP, INBO, CapNet, If-net, Aguajaring, and others as needed.</p>	<p>JWA, ADBI, and ADB to manage</p>	<p>Coordinate activities as needed</p>	<p>JWA, ADBI, ADB</p>	<p>Share IWRM experience</p>

3rd General Meeting of NARBO

Surakarta, February 20-22, 2008

6 – K-Water Proposal

Concept Note for Workshop on River Basin Water Quality Management To be organized by NARBO, APWF's Knowledge Hub and Kwater

Asia-Pacific Water Forum (APWF) was launched in 2006 to improve sustainable water management in the region. The APWF has set out to identify and champion solutions to water issues in the region, and aims to boost investments, build capacity, and enhance cooperation in the water sector.

The Asia Pacific region faces unprecedented challenges in water management in the 21st century because of climate change, urbanization, decentralization, environmental degradation, governance reforms, and other profound changes in society. In order to address these formidable challenges, the NARBO member countries and RBOs in the region need to urgently improve their knowledge generation, sharing, and capacity development for delivering water services and managing water resources in river basins. A new approach is needed that emphasizes knowledge partnerships and networking. In this approach, space is created for countries with advanced expertise and existing centers of excellence in the region to offer their services as regional water knowledge hubs to clients and partners in the region.

At the regional consultation meeting in Singapore in October 2007, a number of candidate organizations have already decided to form a collaborative network. Kwater was nominated as the Candidate regional water knowledge hub for water quality management in river basins. As a part of the activities for the knowledge hub, APWF and Kwater are planning to hold a workshop with the main theme of water quality management under the concept of IWRM in collaboration with NARBO. The details and exact plans will be determined after consulting with ADB and other knowledge hubs. At this point, we would like to propose following tentative scheme.

Expected date: 3 days in September 2008

Location: Korea Institute of Water and Environment (KIWE), Korea Water Resources Corporation (Kwater), Daejeon, Korea

Expected Participants: 25 people (including 20 Trainees and 5 Invited Speakers/ Lecturers)

Main Issues to be covered:

- ✓ Lectures
 - Role of basin water quality management in the context of IWRM
 - Watershed and reservoir water quality management
 - River water quality management
 - IWRM tools for BMP in basin water quality management

- ✓ Hands-on Practice with steady and unsteady water quality models
- ✓ On site training
 - Model applications
 - Visit Kwater's water quality management facilities
 - Field Trip to a study river basin in Korea
- ✓ Individual & Group Discussion

Selection of participants: NARBO, APWF's Knowledge Hub with consultation with Kwater will select the participants based on the submitted report from applicants.

3rd General Meeting of NARBO

Surakarta, February 20-22, 2008

7 – IWRM Training and TAC

3rd NARBO General Meeting, Solo, Indonesia

ANNOUNCEMENT

Creation of the NARBO Technical Advisory Committee¹

Rationale

NARBO seeks expert advice to ensure that the quality and credibility of its annual IWRM Training Program will be at the level of a prestigious regional flagship program that will attract numerous participants who desire to join and successfully complete the program to benefit their work, and who are willing to share in the cost by paying a registration fee of \$200 or more per person. NARBO can also benefit from periodic advice on the strategic direction of its activities to ensure optimal benefits to its members and a high standing among the water development community in the region.

Responsibility

The Technical Advisory Committee (TAC) will advise NARBO's leadership and secretariat in the design of its IWRM Training Program and make specific recommendations on the objectives, target participants, qualifications of applicants, requirements for certification, and guidelines for organization of the program, including venue, host organizations, program scope and detailed content, assignments and ratings, program director and trainers, financing, and frequency. The TAC can also be requested to advise on other strategically important matters concerning NARBO's activities.

Members

Experts who may be invited by the Secretary General include:

- Professor Tsuneaki Yoshida of the University of Tokyo, a founder of NARBO, as Senior Adviser
- Former NARBO Chair, as Senior Adviser
- Heads of selected Asia-Pacific Water Forum Regional Water Knowledge Hubs with direct relevance to NARBO's activities (e.g. the hubs focusing on river basin organizations and management, water quality management in river basins, river basin decision support systems, disaster risk reduction and flood management, climate change, irrigation services, and water governance), as members
- Head of the International Water Centre in Brisbane, as member
- Other experts as needed.

The NARBO Secretariat may call on other experts to join TAC meetings for specific advice as and when needed. These may for example include leading experts of the Global Water Partnership's Technical Committee, CAPNet, UNESCO-IHE Institute for Water Education, and others. The NARBO Chair, Vice-Chair, and Vice-Secretary Generals are also expected to join the TAC meetings when available.

Organization

It is expected that the TAC will meet generally once a year, and that the meetings are organized in conjunction (back-to-back) with NARBO events whenever possible, to reduce costs. The NARBO Secretariat will organize the meetings. TAC membership does not involve remuneration, and members are in principle expected to arrange their own financing to participate in the meetings. Additional meetings can be held using existing video-conferencing facilities (such as those in ADB and World Bank offices). An internet-based discussion platform will be provided exclusively for the TAC members. Agenda and reports will be announced through the NARBO website.

First Meeting

The NARBO Secretariat is exploring opportunities to organize the first TAC meeting in April 2008 in Indonesia at the new Regional Knowledge Hub for River Basin Organizations and Management that is being established by the Ministry of Public Works of Indonesia. This Hub is expected to play a key role in supporting the NARBO Training Program in the future. Organizing the first TAC meeting in April will then give enough lead time for organizing the next IWRM Training Program in November 2008.

¹ NARBO's Charter provides for the establishment of a Technical Advisory Committee to advise and support NARBO in its activities. The committee is convened by the Secretary General. (Article 4.5)

3rd General Meeting of NARBO

Surakarta, February 20-22, 2008

8 – Nomination of New NARBO Officials

Nomination of New NARBO Officials

Chairperson

Dr. Moch Amron (new, Advisor, Ministry of Public Works, Indonesia)

Vice-Chairperson:

Mr. K.W. Ivan de Silva (continued, Director General, Mahaweli Authority of Sri Lanka)

Secretary General:

Mr. Yasutaka Hamada (continued, Executive Director, Japan Water Agency)

In addition, the former Chairperson, Dr. M. Basuki Hadimuljono, who have completed the term of 4 years (2 periods), is invited to NARBO Senior Advisor and continues to assist its activities.