

Integrated Water Resources Management and the People of Asia



NGO Forum
on ADB

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The background of the page features a subtle, abstract pattern of blue wavy lines and ripples, creating a sense of water or flow.

Integrated Water Resources Management

and the

People of Asia

CONTENTS



ACRONYMS	v
FOREWORD	ix
INTRODUCTION.....	xi
BANGLADESH	
IWRM Process in Bangladesh A Case Study of the Southwest Area Integrated Water Resource Planning and Management Project (SWIWRMP).....	1
INDIA	
Putting People First in Baitarani River Basin Management People of Odisha Want Their Ownership and Management of the River Basin as a Matter of Natural Right.....	15
INDONESIA	
Heading in the Wrong Direction? The Integrated Citarum Water Resources Management Investment Program (ICWRMIP) Case Study	41
KYRGYZSTAN	
An IWRM Case Study: Khodga-Bakirgan Transboundary Small River in Kyrgyzstan.....	67
PHILIPPINES	
Privatizing Forests and Water: The ADB-INREM Project in the Upper Bukidnon River Basin.....	79
VIETNAM	
Analysis of the IWRM Application to ADB's "Water Resources Development in Mid and Northeast Red River Delta" (ADB 7 Project)	103

ACRONYMS

ADB	-	Asian Development Bank
A&D	-	Alienable and Disposable
ARMM	-	Autonomous Region of Muslim Mindanao
BBWS	-	Balai Besar Wilayah Sungai (Citarum River Basin Organization)
BENRO	-	Bukidnon Environment and Natural Resources Office
BDWF	-	Basin Department of Water Facilities
BFWMS	-	Bangladesh Flood and Water Management Strategy
BPC	-	Bukidnon Power Commission
BWDB	-	Bangladesh Water Development Board
CAR	-	Cordillera Administrative Region
CAS	-	Country Assistance Strategy
CDM	-	Clean Development Mechanism
COP-16	-	Council of Parties
CTI	-	Coral Triangle Initiative
CWC	-	Central Water Commission
DAS	-	Daerah Aliran Sungai
DENR	-	Department of Environment and Natural Resources
DSDA	-	Dewan Sumber Daya Air (Water Resources Council)
EA	-	Executing Agency
EPIRA	-	Electric Power Industry Reform Act
FAO	-	Food and Agriculture Organization
FAP	-	Flood Action Plan
FCD	-	Flood Control and Drainage
FCD/I	-	Flood Control Drainage and Irrigation
FPCI	-	Free and Prior Informed Consent
GDP	-	Gross Domestic Product
GEF	-	Global Environment Facility
GIZ	-	German Center for International Cooperation
GP3A	-	Gabungan Perkumpulan Petani Pemakai Air (Union of Water Users Farmers Association)
GPWM	-	Guidelines for Participatory Management
GWP	-	Global Water Partnership
ICCs	-	Indigenous Cultural Communities
ICWRMIP	-	Integrated Citarum Water Resources Management Investment Program
IFI	-	International Financial Institution

IMF	-	International Monetary Fund
INREM	-	Integrated Natural Resources and Environment Management
IOMP	-	Irrigation Operation and Maintenance Policy
IPs	-	Indigenous Peoples
IPDPs	-	IP Development Plans
IPSWAM	-	Integrated Planning for Sustainable Water Management
ISS	-	Irrigation Subsector Project
IWG	-	Interagency Working Group
IWMP	-	Integrated Water Management Plan
IWRM	-	Integrated Water Resources Management
JIWMP	-	Java Irrigation and Water Resources Management Project
JMC	-	Joint Management Committee
KCG	-	Kitanglad Cultural Guards
LGU	-	Local Government Unit
LoI	-	Letter of Intent
MDGs	-	Millennium Development Goals
MoEF	-	Ministry of Environment and Forests
MKAVI	-	Mt. Kitanglad Agri-ventures, Inc.
MRIS	-	Manupali River Irrigation System
MWSS	-	Metropolitan Waterworks and Sewerage System
NIA	-	National Irrigation Administration
NIPAS	-	National Integrated Protected Areas System
NGCP	-	National Grid Corporation of the Philippines
NWP	-	National Water Policy
NWMP	-	National Water Management Plan
NWRB	-	National Water Resource Board
O&M	-	Operations and Maintenance
OED	-	Operations Evaluation Department
OIIAWIMP	-	Orissa Integrated Irrigated Agriculture and Water Management Investment Programme
PAP	-	Project Affected People
PEARL	-	Program for Equitable Advancement of Rural Livelihoods
PPTA	-	Project Preparatory Technical Assistance
PSALM	-	Power Sector Assets and Liabilities Management Corporation
PRSL	-	Policy Reform Support Loan
RBO	-	River Basin Organization
RDWA	-	Rural Drinking Water Users Association
RDWF	-	Rayon Department of Water Facilities

REDD	-	Reducing Emissions from Deforestation and Forest Degradation
SA	-	Stakeholders Analysis
SBV	-	State Bank of Vietnam
SBWC	-	Sub-Basin Water Committee
SDC	-	Swiss Agency for Development and Cooperation
SIP	-	Sub-unit Implementation Plan
SPS	-	Safeguards Policy Statement
SRI	-	System of Rice Intensification
SWAWRDP	-	South West Area Water Resources Development Project
SWIWRMP	-	Southwest Area Integrated Water resources Planning and Management Project
TA	-	Technical Assistance
TSR	-	Transboundary Small River
UNDP	-	United Nations Development Programme
UNFCCC	-	United Nations Framework Convention on Climate Change
UNO	-	United Nations Organization
WARECOD	-	Center for Water Resources Conservation and Development
WFP	-	World Food Program
WIO	-	Water Initiatives Odisha
WMA	-	Water Management Association
WMF	-	Water Management Federation
WMG	-	Water Management Group
WMIP	-	Water Management Improvement Project
WMO	-	Water Management Organization
WUAs	-	Water Users Associations

FOREWORD

"The revelation of the secret of water will put an end to all manner of speculation or expediency and their excrescences, to which belong war, hatred, impatience and discord of every kind. The thorough study of water therefore signifies the end of monopolies, the end of all domination in the truest sense of the word and the start of a socialism arising from the development of individualism in its most perfect form..." -1939, Viktor Schauberger

Water is the quintessential life blood to sustainable development in recent times. As the survival of both humanity and ecosystem is directly dependent on this crucial resource, its equitable management and distribution is the foremost challenge of our time. Within the mainstream development discourse, the role of water experts, managers and financers have led to a complex paradigm of various agendas and interests. NGO Forum on ADB through this publication intends to showcase the actual impact of the Asian Development Bank's Integrated Water Resources Management (IWRM) approach. This is a compilation of six (6) case studies which highlight how ADBs role in water management impacts local communities and how it complicates their water struggles. The threat of commoditization, water supply diversion, and inaccessibility of communities will echo in the pages to come.

The diversity of the cases presented encompass on the ground stories coming from the Central Asian republic of Kyrgyzstan to the river basins of Southeast Asia's Vietnam, to the deltaic basins of South Asia, most particularly in India and Bangladesh. Through this publication what is expected to emerge is the paradox of ADB's large-scale project based IWRM notions of water and the opposing concerns of actual community needs and interests.

Doubtless, there are many aspects and complexities regarding water in the investigated areas. This publication will not be able to address them all – this is mainly due to constraints of time and resources. It is also a challenge to compile the diverse cases in their own languages and translate them into English, in order to bring these stories out to the world. Despite all such limitations, including lapses which NGO Forum on ADB takes full responsibility of, our network shall feel encouraged if readers find this publication useful in their work.

We hope this compilation of cases can trigger your current concerns on water and maybe add to your information base and current advocacies. In the meantime as you flip through the stories on ADB water projects and their adverse consequences, I hope you can pick something useful for our common struggle to value, protect and manage this precious resource equitably for all. I wish you a very happy reading.

Rayyan Hassan
Executive Director
NGO Forum on ADB

INTRODUCTION

Asia's water challenges are getting murkier and the politics around them, dirtier. With fast growing economies that need rapid expansion of energy intensive infrastructures, the region seems to be running towards a point of no return in so far as water scarcity is concerned.

The continent's per capita freshwater availability is the lowest among all continents of the world. In fact, at less than 4,000 cubic meters per year, it is less than half of the global average. It is expected that by 2050, half of the world's newly-added population will be from Asia. This is significant and will spell disaster for the already stressed water resources of the continent.

Keeping the global trend of increased water scarcity in mind, which projects that more than two-third of the global population would be in water stressed conditions in just about 13 years, it can well be gauged that Asia is going to be the worst hit.

What is going to make it worse is the water business being promoted by IFIs such as the Asian Development Bank (ADB) under the cover a "holy cow" approach. Water investments are basically playing the "scarcity capitalism," which increases the vulnerability of the region.

Asia now typically symbolizes the new economic growth model that involves extracting minerals, cutting forests, and producing energy and other products for the entire world at an irrecoverable pace. All these activities are guzzling water to such an extent that water has gone beyond a political issue to become a security challenge. What adds to the woes is the fact that the needs of industries coupled with the ever-burgeoning urbanization in Asia are going to surpass water irrigation needs very soon. This is a region where water efficiency, productivity and recharging rates are among lowest in the world. The scarcity stares at the region's face and it is clearly surviving on water that is borrowed from its future generations. Tracking water investments therefore becomes essential, more than ever before.

Any such tracking or monitoring has to follow a people-oriented approach. Putting the communities at helm of affairs to understand the flows and impacts of water investments is essential.

This is why these six research studies have been endeavored by the NGO Forum on ADB. It tracks ADB's involvement in promoting and supporting the Integrated Water Resources Management (IWRM) in six river basins across the continent. It exposes the "holy cow" and finds out that ADB is promoting all such projects under a basic premise of considering water as an "economic good." And that's why it is failing miserably to cater to the local needs of holistic water management.

As evidenced by the case studies, ADB's IWRM financing has failed to take into cognizance both fundamental and scientific concepts of water resources management. Everywhere, the IWRM process has been found to be non-transparent and have not included voices of the basin communities. They have bypassed the basic principles of IWRM. Instead, it promotes biased approaches that favor the rich, the industries and mining lobbyists.

These research cases have been great learning exercises within the Forum itself and have stirred up our minds to initiate a Water Core Group to focus on the water issues in a more strategic approach. I am happy that the case studies are coming to a publication shape; and hopefully, this will be a base tool at our hands to step up our advocacy efforts to promote pro-people and pro-ecology water policies within the ADB.

Ranjan Panda
Lead, Water Core Group

BANGLADESH

IWRM PROCESS IN BANGLADESH

A Case Study of the Southwest Area Integrated Water Resource Planning and Management Project (SWIWRMP)



KAZI ZAVED KHALID PASHA

Initiative for Right View (IRV)

Background

As a conceptual solution to the complex problems of water management, the Integrated Water Resources Management (IWRM) has recently come to prominence. The institutional transfer of IWRM from international to domestic arena has been widespread. It is important that IWRM not only deals with water supply and wastewater treatment but combines as well many other functions, including flood control, poverty alleviation, food production, ecosystem conservation, and drought management. The government's presence is vital in the effective implementation of IWRM. An effective IWRM should be founded on a participatory basis, whereby all stakeholders should have a voice in each stage of the project cycle, from planning to operation and maintenance. Every government water-related project, every mega-construction on water sources, every private entrepreneur of water is very much vocal in their agreement of IWRM.

But the ground scenario is quite different. Projects funded by international financial institutions (IFIs) have not achieved its declared goals and objectives. Day by day, water becomes more costly and increasingly inaccessible to common people. Water issues have thus become even more prominent. Traditional community expertise and knowledge does not hold much weight in IWRM (though it is very much high-sounding on this aspect).

Bangladesh is not an exception in this process. The National Water Policy (NWP) recognizes the need for fundamental reforms in the water sector institutions in order to carry out the policy objectives. One of the principal elements is the need for increased decentralization in decision-making (the IWRM principle of management at the lowest appropriate level). The project will strengthen the move towards this end by building the capacity for IWRM planning at the regional level, which also includes support to participatory management groups as well as line agencies.

In Bangladesh, the Asian Development Bank (ADB) has been supporting the IWRM implementation. The Southwest Integrated Water Resource Planning and Management Project (SWIWRMP) is one of the water-related projects being implemented in the southwest coastal region. One of the main objectives of the project is to implement participatory Integrated Water Management Plans in selected Flood Control Drainage and Irrigation (FCD/I) schemes.

The previous experience with FCD/I planning and implementation scheme has revealed weaknesses in its ability to address the specific needs of the poor and to sustain the projects. The insufficient recognition of the specific needs of potential beneficiaries due to a "top-down" approach has resulted in little sense of ownership or responsibility on the part of the beneficiaries. This has contributed to the paucity of Operation and Maintenance (O&M) being carried out in the schemes. Through this study, the preparation for IWRM in selected subprojects was reviewed. Moreover, ADB's approach towards water resource management was also analyzed.

Goal Objective and Methodology

Goal: To analyze the IWRM implementation process in ADB-funded projects in the southwest region

Objectives: To conduct a people-centric analysis of IWRM implementation process in ADB-funded projects in the southwest region

To identify issues and problems that would help devise and facilitate advocacy for the IWRM plan for the basin where the rights of the local people, communities and ecology are properly established and respected

Methodology: For the study both primary and secondary information were collected.

Questionnaire survey, interview and meeting with the Water Management Federation (WMF) and Water Management Group (WMG) also conducted.

- **Questionnaire development:** A set of questionnaire was developed and filled up by 100 respondents.
- **Survey questionnaire:** Questions were surveyed in the two sub project areas to gather the views of the different stakeholders like water users, community people, women, fishermen, farmers, different water groups, Bangladesh Water Development Board regarding water management and its effects.
- **Conducting Interview:** Interview was conducted in both subproject areas. 50 interviews was conducted in Narail Subproject areas in Narail and Kalia Sub district in Narail district and another 50 interview was conducted in Chenchuri beel subproject areas in Lohagra and Kalia sub district of Narail District.
- **Case study:** Three case studies were conducted in two subproject areas. One with a community people and other two with the committee member of WMO of the ADB funded project.
- **Journalist visit:** Two teams of journalists visited the project areas and collected the planning and formation procedure of different water group and also the implemetation within progress of the project. They also collected the framework of IWRM in the project.
- **Consultation meetings with Water Management Organization (WMO) and Water Management Group (WMG):** Consultations with fisher folks, women, farmers, and members of the WMGs were conducted to understand what they think about the IWRM process.
- **Secondary data collection:** Secondary data was collected from various reports and articles focusing on IWRM, water management, and river basin management. Reports published by different ministries of the government and different national and international NGOs, as well as reports from UN, World Food Program (WFP), and different newspapers were also used.

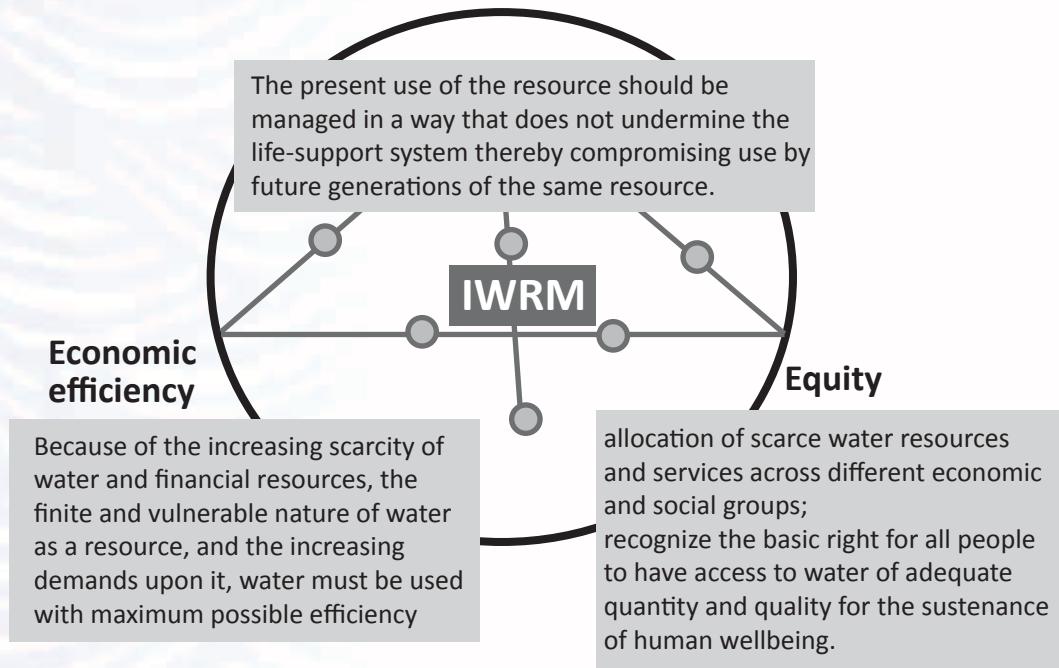
Water-related documents from various sources, including experts, government and other institutions, that talked about the river and its impacts and the changes in demands for water were collected and reviewed to identify the gaps in the project. Finally all the findings from different activities compiled as a case study.

Integrated Water Resource Management (IWRM)

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

Water is the common symbol of humanity, social equality and justice. It is one of our compelling links with the sacred, with nature and with our cultural heritage (Dooge, 2003). A case in point is the Ganges River in South Asia which has a very strong spiritual and cultural significance to all Indians, Bangladeshis and Nepalis. Regrettably, the current IWRM mechanism does not acknowledge water's spiritual and cultural dimensions. Without recognizing these, water resource management may prove to be piecemeal and ephemeral.

Figure 1.



Source: IWRM concepts, principals and women in IWM, Naiza Hassan, Environment Science Discipline, Khulna University

Principal components of IWRM

- **Managing water resources at the basin or watershed scale.** This includes integrating land and water, upstream and downstream, groundwater, surface water, and coastal resources.
- **Optimizing supply.** This involves conducting assessments of surface and groundwater supplies, analyzing water balance, adopting wastewater reuse, and evaluating the environmental impacts of distribution and use options.
- **Managing demand.** This includes adopting cost recovery policies, utilizing water-efficient technologies, and establishing decentralized water management authorities.

- **Providing equitable access to water resources through participatory and transparent governance and management.** This may include support for effective water users' associations, involvement of marginalized groups, and consideration of gender issues.
- **Establishing improved and integrated policy, regulatory, and institutional frameworks.** Examples are implementation of the polluter-pays principle, water quality norms and standards, and market-based regulatory mechanisms.

IWRM in Bangladesh

In recent years, the government has progressively improved the policy, institutional, and planning framework for the water sector with the coordinated support of external financiers that include the ADB. The NWP of 1999 adopted key principles such as IWRM, sustainable service delivery and O&M with progressive transfer of facility management to Water Management Associations (WMAs). Improvement of the framework is followed by ongoing institutional reforms of sector agencies for better governance, and the adoption of the National Water Management Plan (NWMP) in 2004 that provides a sector strategy and priority programs with a long-term perspective. The key challenge now is to transform these initiatives into genuine sector operations.



The concept of IWRM is increasingly becoming of critical importance for the better management of water resources in Bangladesh. In Bangladesh, IWRM plays a role in agriculture, irrigation, industrial sector, energy and power generation, flood management, and environmental protection, in which water resources management is regarded as an integral element. The concept of IWRM encompasses a number of interrelated issues regarding water uses and management and how these should be accommodated in a holistic framework. An integrated water resources perspective ensures that it has social, economic, and environmental dimensions.

Right after the two consecutive disastrous floods in 1954 and 1955, the United Nations commissioned a mission led by Mr. Krugg to look into the problems of flooding in Bangladesh and to recommend remedial measures. In 1956, the Krugg Mission finalized its report and submitted it to the then government of Pakistan. The principal recommendations of the Krugg Mission were the following:

- i) Formulate a master plan for water and power development;
- ii) Constitute a statutory body to deal with water and power development; and
- iii) Conduct intensive hydrological survey and investigations.

The Krugg Mission mainly focused on protecting the agricultural lands from the flood because during that time agriculture was the backbone of the economy. Moreover, self-sufficiency in food was the cornerstone of government policy. As a result, a Water Development Master Plan was prepared in 1964 where structural options that have large project portfolios were given priority. Accordingly, the government started implementing large projects with the objectives of providing flood protection, improving drainage and providing irrigation.

With the implementation of some large Flood Control, Drainage and Irrigation (FCDI) projects, the government came to realize that the implementation of large projects involve large investments as well as longer duration. Consequently, it takes a long time to derive benefits from them. The government then opted for implementation of small- and medium-scale FCD projects to provide early benefits.

As a result, the issue of formulating National Water Policy (NWP) came to the government's attention. In 1982, the government formulated a NWP that looked into various aspects of water use, as well as the demand and interest of different stakeholders involved in the water sector. NWP was finalized in 1986 but it did not receive the government's approval due to some drawbacks. After the disastrous floods of 1987 and 1988, the formulation of a National Water and Flood Management Strategy came to fore again for obvious reasons. All international development partners supported a project called Flood Action Plan (FAP) from 1990 to 1996 that formulated a National Flood and Water Management Strategy. The FAP was mainly a study project involving 26 components. On the basis of FAP activities, the government formulated the Bangladesh Flood and Water Management Strategy (BFWMS) in 1996. In BFWMS, some policy guidelines for water resources development and management were envisaged such as people's participation, environmental impact assessment (EIA), and multi-criteria analysis. All these were made mandatory in the planning process of all future water sector projects.



At the conclusion of the FAP studies, the government realized that IWRM has not addressed any of the issues concerning water resources development and utilization. Then in 1998, the government again formulated a NWMP that cut across different sectors of the national economy in light of IWRM. In order to guide the preparation of NWMP, the government formulated a NWP in 1999. The NWP recognizes the need for fundamental reforms in the water sector institutions to carry out the policy objectives. One of the principal elements of these reforms is the need for increased decentralization of decision-making (the IWRM principle of management at the lowest appropriate level).

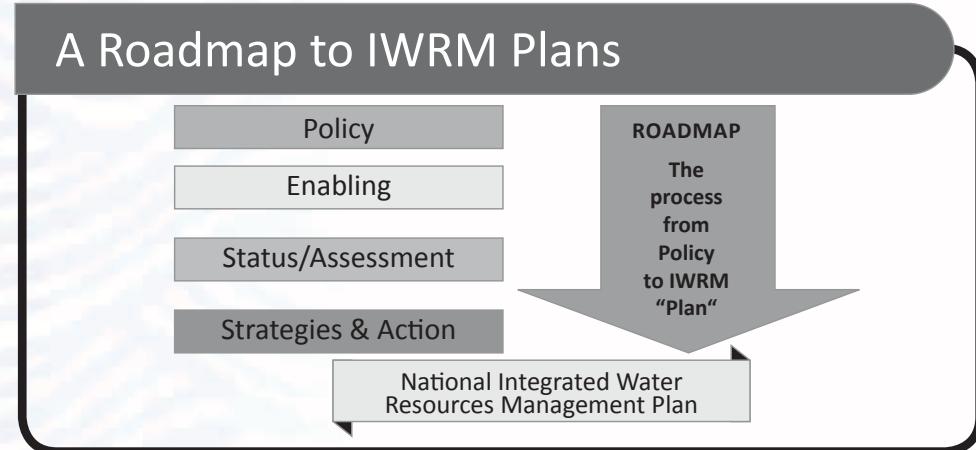


Figure 2

The NWMP was prepared in 2001 with a 25-year projection. It has 84 programs cross-cutting 11 different sectors of the economy. Access to safe drinking water and sanitation has been given topmost priority. The NWMP has explicitly failed to address the issue of poverty reduction, but the government wants to put it as a topmost economic goal.

Bangladesh and the Framework for IWRM

IWRM is a continuous process with steps similar to the above phases and suggests three key areas to target change to facilitate the implementation of IWRM: The enabling environment, institutional roles and management instruments (GWP Technical Committee, 2005)

Creating an Enabling Environment: The enabling environment consists of setting policy and goals to drive the process with corresponding legislation and financial support.

1. National water policy
2. National water management plan
3. Legislation

Planning and Prioritization

1. Information system: Coordination in data dissemination
2. Assessment of water resources: Math models; Blue accounting; EIA
3. Management procedures: Guidelines and economic instruments needed

Institutional Issues: The institutional roles involve developing the appropriate organizational structure and the institutional capacity to coordinate water management

1. Level of Action: Strongly centralized administration - Hard to integrate
2. Management boundaries: Domains and relations to other organizations
3. Capacity building: Institutional capacity is well-built at all levels, including community level.

Current IWRM Implementation Process in Southwest Region by ADB-funded Project

About 58% of the Southwest (SW) area of Bangladesh is covered by the Flood Control and Drainage (FCD) and the Flood Control and Drainage/Irrigation (FCD/I) project, most of which are performing sub-optimally and are in need of rehabilitation. With this end in view, the Bangladesh Water Development Board (BWDB) initiated three projects Water Management Improvement Project (WMIP), Integrated Planning for Sustainable Water Management (IPSWAM), and South West Area Water Resources Development Project (SWAWRDP) to identify and select a good number of existing projects covering a sizeable area.



In 1997, the SWAWRDP study identified seven existing FCD and FCD/I projects for conducting feasibility studies with ADB's assistance. This was not carried on for further actions and was discontinued in 1998 for various reasons. Nevertheless, a Project Preparatory Technical Assistance (PPTA) was carried out between September 2003 and December 2004 to address poverty reduction in targeted areas of the SW region through:

Preparation of Participatory IWRM Plans in Selected Hydrological Units

1. Sustainable water management to promote both crop and non-crop subsectors through implementation of the IWRM plans
2. Strengthening institutional capacities for planning implementation and O&M of demand-driven IWRM projects

IWRM process in the Southwest Area Integrated Water Resources Planning and Management Project (SWIWRMP)

In recent years, the government has initiated policy and institutional reforms in the water resources sector to address past weaknesses. A comprehensive national water policy was approved which adopted the principles of integrated water resources management, stakeholder participation, sound social and environmental management, sustainable service delivery with management transfer to Water Management Organizations (WMOs). Reforms of sector institutions such as BWDB to address the policy requirements were also initiated. Within this improved environment, the government intends to: (i) enhance the performance of the water management infrastructure through integrated and participatory planning and implementation; (ii) establish local WMOs that can sustain the optimal benefits with integrated and coordinated O&M, either on their own (for small structures) or jointly with Bangladesh Water Development Board (BWDB) (for large structures); and (iii) establish effective public support systems. The project aims to promote the process towards these ends. Likewise, it aims to enhance economic growth and reduce poverty in the rural areas of selected sub-regions in the southwest. Its immediate objective is to enhance productivity and sustainability of existing FCD/I systems suffering from dismal performance and low incomes. This would be achieved through:

- preparing participatory integrated water management plans (IWMPs) for the concerned areas;
- delivering services for WMO development, water management facilities, and support for agriculture, fishery, and livelihood enhancement; and
- strengthening institutions to operate these functions in delivering intended benefits with self-sustaining O&M.



Geographical Characteristics of the Subprojects

The project area is located in the southwest part of the Bengal Basin, a long-established area of subsidence and deposition containing an almost complete sequence from the Cretaceous to Recent alluvium. The Chenchuri Beel and Narail subprojects are located within the Low Ganges River Flood Plain and Gopalgonj Khulna Beels; these are so-called agri-ecological zones. The Low Ganges River Flood Plain area has a typical meander landscape of broad ridges and basins.

The hydrological regime in the Chenchuri Beel area is governed by the rivers Chitra on the west side and Nabaganga to the north, east and south, and the Canals (khals) flowing through the beel. The Chitra and Bhairab Rivers dominate the Narail subproject area hydrological regime. The Bhairab River originates from the Ganges in the Indian territory and meets with the Kobadak River at Jikargacga under the Jessore district.

Figure 3
Map-1.NARAIL SUBPROJECT



Figure 4
Map-2 CHENCHURI BEEL SUBPROJECT



Formation Process of Different Water Management Organizations

According to the final inception report, it was found that the Guidelines for Participatory Water Management (GPWM) recommended the formation of three tiers of WMOs for subprojects above 5000 hectares, the same area covered by the schemes under the project. Based on GPWM's recommendation, the following composition of WMO is proposed for the subprojects of the Southwest Area Integrated Water Resource Planning and Management Project.

It should be noted that the project will consciously address gender concerns by ensuring that women will have a minimum representation of at least 33% at all levels of the WMO. This includes the various committees to be formed such as executive committee, managing committee, labor contracting societies and other committees identified to further enhance the participation of beneficiaries in project activities and improve the operation of the WMO.

Formation of Water Management Group (WMG)

The formation of the Water Management Group (WMG) is ongoing. It is based on each sub-unit/hydrological unit, which corresponds to a water controlling structure within the impacted/affected command area and villages. This means forming 25 WMGs in Narail and 18 WMGs in Chenchuri Beel since these areas have 25 and 18 sub-units/hydrologic units, respectively. Women and men belonging to households of farmers, fishermen, aquaculturist, small traders, boatmen, craftsmen, landless people, destitute householders, and project-affected peoples (PAPs) will be invited as general members of the



WMG. Men and women representatives from the local government institutions (Union Parishad) and private organizations will act as advisors of the WMG.

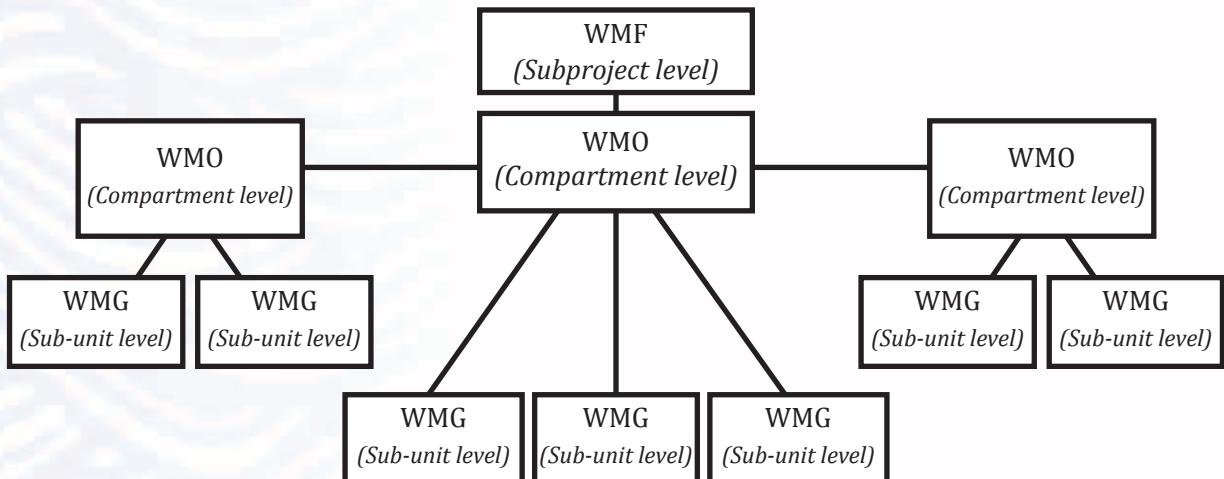
Formation of Water Management Organization (WMO)

The WMO will be formed at the mid-level for each compartment/subsystem of the subproject. There will be 6 WMOs in Narail and 8 WMOs in Chenchuri Beel since these areas consist of 6 and 8 compartments, respectively. Representatives of the general membership of WMGs will be the general members of the WMO. Men and women representatives from the local government institutions (Union Parishad) and private organizations will act as advisors of the WMO.

Composition of Water Management Federation (WMF)

WMF will be formed at the apex level of a subproject/FCDI. The decision to form WMF, however, will be based on the local situation and the preference of the beneficiaries. Representatives of the general members of WMO will be the general members of the WMF. Men and women representatives from the local government institutions (Union Parishad) and private organizations will act as advisors of the WMF.

The Envisaged Organizational Structure of the Water Management Organizations of the Project



Sub-unit Implementation Plan (SIP) Preparation

A WMA for each sub-unit and subordinate water management groups (WMGs) corresponding to individual facilities within the sub-unit will be formed following the cooperatives' legal framework. At the outset, the project will support the formation of an ad hoc WMA and WMGs within the sub-unit. It will prepare an SIP through private firms by setting out specific impact targets and associated programs, including inputs and delivery schedules. The SIP will also reconfirm the sub-unit's economic feasibility, include resettlement and environmental management plans following the IWMP safeguards outputs, and be endorsed by the WMA.



Operation & Maintenance Phase

The project establishes permanent institutions and their operational framework to operate and maintain the improved water management infrastructure. The major facilities are envisaged to be managed by BWDB, following the decisions of the Joint Management Committee (JMC) established with the representatives of the line departments, local governments, and WMOs.

The transfer of management to local WMOs will also be considered in the medium-term to long-term. The local water management facilities that will address management problems through small-scale structures (e.g., water retention structures, inlet/outlet, regulators, and excavated canals (khals) will be managed by the local WMOs with the participation of stakeholder groups within the command area of the facilities.

People-Centric Views on the IWRM Implementation Process in SWIWRMP

It asserts that community participation in the identification, planning, implementation, operation and maintenance of water management projects is essential for promoting equity and transparency in the development of sustainable solutions to water management problems. Stakeholders at all levels of the social structure should be able to participate in decision making so that all relevant interests are taken into consideration. All stakeholders, both inside and outside of the project area, should have access to all information related to the project.

Following are the findings and opinion of all the stakeholders who are directly linked with the process.

- The complexity and holistic nature of IWRM is not well-understood yet by many policymakers and sector professionals.
- In the formation of different water management groups, there is insufficient recognition of the specific needs of the potential beneficiaries. The “top-down” approach has resulted in having a lesser sense of ownership or responsibility on the part of the beneficiaries.
- The project area has been heavily impacted by human intervention. Flood protection structures have changed the natural fauna and flora of the area. The project areas are mainly the wetlands. This project will turn these environmentally sensitive areas into dry land.
- Sedimentation and drainage congestion, compounded by the late monsoon, are the main hindrances in agricultural production. In many cases, the gates/regulators do not function properly. Thus, the water management demand for alternative crops cannot be met.
- Compartmentalization of subproject areas will deny the community access to natural resources.
- The members of different water groups know little about the IWRM process. They cannot understand what is written in the SIP documents.
- Most of the committees are formed and documented by family members (including fathers, mothers, and sons) who attend most of the trainings.
- The chairman and secretary, being the most powerful in the decision-making process, are giving priorities to their own people.
- Per the opinion of the communities, they are not getting support from the infrastructure because the gates and sluice gates do not operate efficiently. The people's choices are not reflected in the construction work.
- Influential groups are engaged in construction work so the WMGs have nothing to do. Mobilization efforts in the formation of WMOs are weak. Many of the committee members are conscious young people. Socially acceptable persons are excluded. The membership of most of the committees numbers between 140 to 200. As a result, there is no coordination among the members. Drop-out rate is high.
- The building, operation and maintenance of infrastructures like sluice gate/regulators of the project that was built by several committees in collaboration with a government body,



are problematic. After project implementation, there is no one to look after the structures. This situation creates problems in the fair and balanced use of water for fish and crop in modification flood plains as observed at the Narail pilot site. Because in practical floods plain has been diverting to the crop land due to unavailability water. As a result flood plains are decreasing and agricultural land is increasing,

- The project amounting to US \$43.4 million will be invested to promote improved livelihood pattern among the local people. However, in the FGD and questionnaire survey conducted in these project areas, the people expressed concerns about the sedimentation and drainage congestion, as well as the late monsoon, being the main hindrances in the agriculture production. They also cited the increasing salinity as another threat.
- As per the Gender Action Plan (GAP) women are not provided with time-saving technology. The linkage with women with water management plan and implementation procedure was not established in the case of agriculture extension activities. There is no provision for women to play an active role in the different water management committees.
- GAP said women will be involved in maintaining embankments and other infrastructures, but it is very clear that this is not possible. Men are not getting work. How will women engage in this process?
- As per the guidelines, 33% of women will be included in the committee but their selection process is not clear.
- Though the project suggests helping improve irrigated agriculture through the enhancement of protection from flooding and the expanded coverage of irrigation, this might not be that helpful to those poor farmers whose lands are far from the canal system. Due to their poor economic condition, the poor farmers will not be able to take advantage of the canals and therefore would not be in a position to reap the benefits from such activities.
- The fishery species affected due to FCD/I is mostly migratory white fish which use both river and floodplain habitats in their lifecycle. But infrastructures like sluice gate and regulator have obstructed migration, which in turn has led to reduced fish yield and species diversity within the modified floodplains.
- Apart from the impacts on fisheries, the FCD/I project and during the so called green revolution the slogan of the “Grow More Food” campaign have affected the diversity of crops grown in Bangladesh’s floodplains. Now, agricultural production is predominantly rice-based whilst the cultivation of pulses, oilseed, wheat and other rabi crops has been reduced considerably within the FCD/I project in particular and the country in general.
- The Integrated Water Resources Management is founded on a participatory basis, whereby all stakeholders should have a voice in each stage of the project cycle, from planning to operation and maintenance. However, communities have less participation in the process.
- The implementation process did not follow the “demand-driven” approach in all aspects of water management and its subsectors.
- Though the project is designed to recognize past deficiencies and to incorporate the lessons learned into the new paradigm of water management, it is not properly implementing the design in this project.
- Past experience with FCD/I planning and implementation has revealed weaknesses in their ability to address both the specific needs of the poor and the sustainability of the projects.
- In the augmentation of the surface water flows in the region, the community has demanded the need for sustainable operation and maintenance. This mechanism should be more rationalized.



- Without effective stakeholder participation, the development potentials of existing FCD/I systems will not be successfully realized.
- Though the project aims to help alleviate poverty by increasing the agricultural production, employment and income generation possibilities, the actual on-the-ground scene is quite the contrary. There is little coordination between project implementers and the agriculture department.
- Water retention structures may be operated to draw and store excessive amount of water, causing drainage problems in low-lying areas. On the other hand, the water level may be kept low, without providing intended benefits to the high land area.
- Appropriate mitigation measures have to be operated at the various stages of site selection, design, WMO formation, implementation, and O&M to mitigate such risk.
- However, IWRM is still not well-understood at the national and local levels. The effective implementation of IWRM plans is severely hampered by institutional and organizational constraints, and more must be done to mitigate adverse project impacts and ensure environmental sustainability, gender equity, and pro-poor and participatory practices in both the management and delivery of water services. Importantly, operations and maintenance (O&M) has been severely hampered by lack of resources.
- FCD/I scheme infrastructure provides a common good. Benefits are felt by both rich and poor, but in pure economic terms, it is the rich with larger landholdings that have tended to accrue the most benefit. The landless poor continue to be marginalized from livelihood-enhancing opportunities and have remained unable to escape from the poverty spiral. There is a pressing need for the application of new paradigms in water management, which facilitate not only the recognition of these marginalized groups but also present mechanisms whereby they are empowered within the community to improve their livelihood opportunities.



The Remaining Question

How is it possible to achieve the following benefits from the project by 2015 per the inception report (July 2007)?

1. Cropping intensity to increase by 30%; annual cereal production to increase by 166000 tones; and other crops by 72,000 tones
2. Culture fish by 5,000 gross margin per farm to increase by 40%
3. Employment of 7.2 million man-day and
4. Annual family income of landless by Taka 2000

Conclusion

Water is a basic human need and access to minimum quantities of safe water (20 liters per person per day) should be everyone's right. Lack of access to safe drinking water, sanitation, and irrigation is directly related to poverty and poor health.

Every government water-related project, every mega-construction on water sources, and every private entrepreneur of water is very much 'vocal,' 'concerned' and 'in agreement' with IWRM. But the ground scenario is quite different. IFI-funded maximum projects have not achieved its declared goals and objectives. Day by day, water becomes more costly as water issues become more prominent. As a result, water has become inaccessible to the common people. Traditional

community expertise and knowledge holds very little weight in IWRM, though it is very much high-sounding on this aspect.

The application of economic principles to the allocation of water should not become acceptable. Water should not be treated as a market commodity when it comes to domestic use for very basic needs (Gunatilake & Gopalakrishnan, 2002), particularly for people in extreme poverty. More discussion, analysis, study, and commitment are needed in deciding whether water is a common good or an economic good.



Bibliography

- Ali. A.K.M.Masud (December 2005). *Agrarian Living Beyond the Corporate Cage*. Bangaladesh: INCIDIN.
- Asian Development Bank (2006). *Private Sector Operations: Catalyzing Private Investments across Asia and the Pacific*. Accountability Mechanism, March 2004, Asian Development Bank
- Asian Development Bank (October 2005). *Report and Recommendation of the President to the Board of Directors, Proposed Loan, Bangladesh: Southwest Area Integrated Water, Resources Planning and Management Project*,
- Halcrow Group Ltd., (June 2005). *Environmental Impact Assessment (Chenchuri Beel and Narail Subprojects)*, Project Number: 34418, BAN: Southwest Area Integrated Water Resources, Planning and Management Project.
- Asian Development Bank (January 2009). *Policy Paper, Document Stage: Working Paper, Safeguard Policy Statement*. (July 2007). *Final Inception Report Southwest Integrated Water Resource Planning and Management Project*.
- Asian Development Bank (2006). *Water for All: Final Report and Recommendation*.
- Towards a Strategy on Human Capacity-Building for Integrated Water Resources Management and Service Delivery, Water Education Training.
- Rahman Muhammad Mizanur and Varis Olli (2005). *Integrated Water Resources Management: Valuation, Prospects and Future Challenges*. Water resource laboratory, Helsinki University of Technology
- Ashraf-ul-Alam tutu (September 2007). *Research Report: Reviewing IWRM in Perspective of People's Wisdom, Water for People's Network Asia*.
- Biswas, A., Unver, O., and Tortajada, C. (2005). *Water as a Focus for Regional Development*. New Delhi: Oxford University Press.
- Ekbladh (2002). "Mr. TVA": Grassroots Development, David Lilienthal, and the Rise and Fall of the TVA as a Symbol for U.S. Overseas Development, 1933 – 1973. *Diplomatic History*, 26:3.
- Global Water Partnership (2006). *GWP in Action* (on-line). URL: <http://www.gwpforum.org/servlet/PSP?iNodeID=263&iFromNodeID=102> (accessed 01 December 2006)
- F.G. Mukhtarov, *Integrated Water Resources Management from a Policy Transfer Perspective*.
- IWRM & THE TOOLBOX
- Hassan Nazia (YEAR?) *IWRM Concepts, Principles and Women in WRM*. Khulna University.
- Young Citizens: Youth and Participatory Governance in Africa, *Participatory Learning and Action-64*, 2011IIED.
- Governance of Natural Resources: The Key to a Just World that Values and Conserves Nature?
- Kent Lia and Simon Michael. (January 2007). *Safeguarding or Disregarding?*
- Schaefer, R.T. and Lamm, R.P. (April 2006). *Irrelevance Leadership: The Asian Development Bank (ADB) and Climate Change*. The McGraw-Hill Companies, Inc.
- NGO Forum on ADB (October 2006). *Untold Realities*.
- (March 2005). *Good Practices for the Evaluation of Policy-Based Learning by Multilateral Development Bank*.
- Asian Development Bank (April 2005). *Gender Equality Results in ADB Projects*.

INDIA

PUTTING PEOPLE FIRST IN BAITARANI RIVER BASIN MANAGEMENT

People of Odisha Want Their Ownership
and Management of the River Basin as a
Matter of Natural Right

RANJAN K. PANDA
Water Initiatives Odisha



A Note on the Study

The study is a result of a series of consultation and analysis of documents on the subject. It is more of a subjective research that has prioritized people's knowledge and perceptions over scientific information that many times is beyond the level of understanding of a common person. We had three meetings with people along the Baitarani Basin to get their knowledge on the subject and then tried to compile the report using what they said and what we could get as secondary information from government and other documents. This is a thought-provoking paper on the issue, not a comprehensive research. We need more in-depth and comprehensive studies to be able to understand all the issues and problems concerning Baitarani River Basin in all their nuances.

We thank each and every one who helped us in this: the local people, civil society organisations and members of Water Initiatives Odisha.

Rivers of Odisha: An Overview

The physical map of Odisha can be subdivided into thirteen river basins (See Table 1), ten of which join the Bay of Bengal and the other three join the Godavari River. The largest one, the Mahanadi, originates from Trikuta of Amarkantak range in Madha Pradesh (place from which the Narmada and Sone also originate). Two of them, the Brahmani and Subarnarekha, originate from the Chhotanagpur plateau. The Baitarani originates from the Kendujhar plateau and Budhabalanga from the eastern slopes of the Eastern Ghats (Meghasan hills). Other rivers get their origin from the southern and south western parts of the Eastern ghats (Rushikulya, Bansadhara, Nagavali, Bahuda, Mahendratanaya, Machhakunda-Sileru, Kolab-Sabari and Indravati Bhaskel). A study of these rivers brings varied and interesting experience. Very few people (e.g., geographers, hydrologists, geologists, agronomists, engineers) have tried to understand these river systems. A lot of work has yet to be done on these rivers which have been used and misused during the last century.

Table 1: River Spread

Name of River	Length in km	Total Catchment Area in km ²	Delta Area in km ²
Subarnarekha	472	19500 / 29196	2.20
Budhabalanga	164	4513	
Baitarani	344	10400	1713 (10.47)
Brahmani	702	36400	2220 (6.10)
Mahanadi	853	132600 / 141589	7644 (5.76)
Rushikulya	184	7982	
Bahuda	60 + 70 AP OD		Flows into Andhra, joins bay with Ichhapur March
Vansadhara	273 (151 Odisha)		Flows into Andhra to join the bay
Nagavali Jhanjavati	242 (101 Odisha)	3365	Flows into Andhra to join the bay
Indravati Bhaskal	582 (124 Odisha)	2004	Joins Godavari
Machhakunda – Sileru		3120	Joins Godavari
Kolab – Sabari	450 (90 Odisha)	4832	Joins Godavari
Mahendratanaya	60 + 90 OD AP		Flows into Andhra, joins Bay with an estuary

OD = Odisha, AP = Andhra Pradesh

The government of Odisha considers all the above as 11 river basins only. The following narratives and information are sourced from various government reports and websites.

Subernarekha Basin

Catchment Area (Total):

19,277 km²

Orissa: 2983, Jharkhand: 13222 , WB: 3022

Districtwise Area:

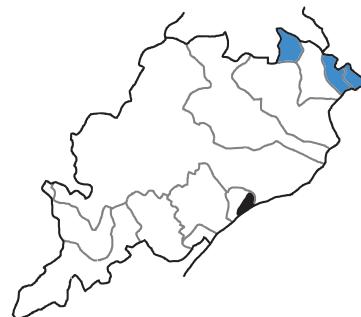
Mayurbhanj: 2199, Balasore: 784

Major Tributaries

(Orissa): Kharkhai R.

Length (Total): 446.12 km

Orissa:79 km



Population (2001):

1,150,904

Density:386 / km²

Annual Rainfall:

Max:3846 mm, Min:

577 mm

Forest:

20.86 ThHa

Burhabalanga and Jambhira Basin

Catchment Area (Total):

6,691 km²

Orissa:6354, WB:337

Districts:

Mayurbhanj, Balasore

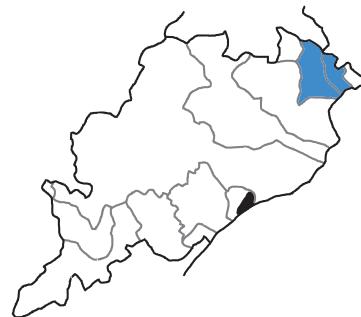
Major Tributaries (Orissa):

Sunei, Kalo, Katra, Sana N.

Length: 289 km

Burhabalanga:198.75 km,

Jambhira:90 km



Population (2001):

1,858,710

Density:293 / km²

Annual Rainfall:

Max:3295 mm, Min:

544 mm

Forest:

190 ThHa

Baitarani Basin

Catchment Area (Total):

14,218 km²

Orissa:13482, Jharkhand:736

District-wise Area:

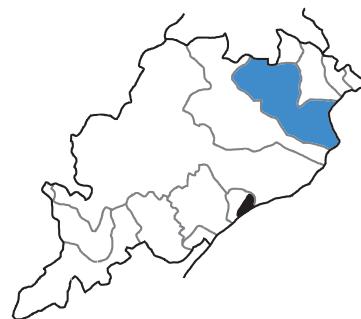
Balasore:42, Bhadrak:2198

Jajpur:1006, Kendrapada:274,

Angul:31

Keonjhar:6824,

Mayurbhanj:2926, Sundergarh:181



Major Tributaries (Orissa):

Deo, Kanjhari, Kusei, Salandi

Population (2001):

3,829,931

Density:269 / km²

Annual Rainfall:

Max:3094 mm, Min:

642 mm

Brahmani Basin

Catchment Area (Total):

39,116 km²

Orissa:22516, Jharkhand:15700,

Chhatisgarh:900

Districtwise Area:

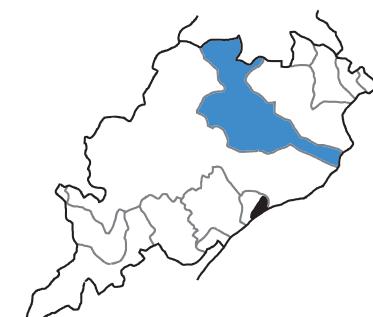
Sundergarh:5794, Sambalpur:1371

Angul:4226,

Dhenkanal:3957, Deogarh:2512

Keonjhar:1723,

Jajpur:1825, Kendrapara:1107



Major Tributaries (Orissa):

Sankh,Koel,Gohira,Tikira, Samakoi, Ramiala

Population (2001):

5,110,660

Density:236/ km²

Annual Rainfall:

Max:2654 mm, Min:

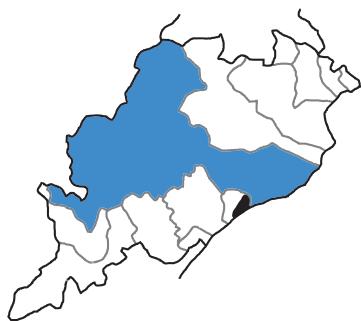
380.4 mm

Forest:

5,606 ThHa

Mahanadi Basin

Catchment Area (Total):
141,134 km²
 Orissa:65628, Jharkhand:132
 Chhatisgarh:75136,Maharashtra:238
Major Tributaries (Orissa):
 Ib, Jeera, Ong, Tel, Brutang, Manjore
 Karandijore, Hariharjore, Surubalijore



Length:
 Orissa:494 km,
 Chhatisgarh:357 km
Population (2001):
3,421,612
Forest:
 2302 ThHa

Rushikulya Basin

Catchment Area: 8,963 km²
 Ganjam:7366, Khurda:56
 Gajapati:398, Kandhamal:800,
 Nayagarh:343
Major Tributaries:
 Badanadi, Dhanei, Ghodahado,
 Padma Baghua



Population (2001):
2,942,901
 Density: 328 / km²
Annual Rainfall:
 Max:2553 mm,
 Min:257 mm
Forest:
 349 ThHa

Bahuda Basin

Catchment Area (Total):
1,118 km²
 Orissa:890, Andhra Pradesh:228
District-wise Area:
 Ganjam:786, Gajapati: 104
Major Tributaries:
 Poichandia, Boginadi, Batruda
 Nalla



Length (Total): 96km
 Orissa: 78 km, Andhra
 Pradesh:18 km
Population (2001):
270,937
 Density: 304 / km²
Annual Rainfall:
 Max:1500 mm,
 Min:900 mm
Forest:
 36.1 ThHa

Vansadhara Basin

Catchment Area (Total):
11,377 km²
 Orissa:8960, Andhra Pradesh:2417
Districts:
 Gajapati, Rayagada, Kalahandi,
 Kandhamal
Major Tributaries:
 Badanalla, Harbhangi
 Mahendratanaya, Sananadi



Population (2001):
1,023,338
 Density: 114 / km²
Annual Rainfall:
 Max:2591 mm,
 Min:410 mm

Nagavali Basin

Catchment Area (Total):
9,275 km²
Orissa:4500, Andhra Pradesh:4775
District-wise Area:
Koraput:4005, Kalahandi:495
Major Tributaries:
*Jhanjabati, Sananadi, Barha Nadi
 Situguda N.*



Length (Total): 217km
*Orissa: 125 km,
 Andhra Pradesh: 92 km*
Population (2001):
578,143
Density: 128/ km²
Annual Rainfall:
*Max:1973 mm,
 Min:1077 mm*
Forest:
 29.7 ThHa

Indravati Basin

Catchment Area (Total):
41,700 km²
*Orissa:7,400,
 Andhra Pradesh:34,300*
District wise Area:
*Koraput:2310, Kalahandi:737
 Rauagada:1043, Nawrangpur:3310*
Major Tributaries:
*Kapur,Muran,Telengiri,Joura,Turi,
 Bhaskel*



Population (2001):
1,191,460
Density: 161/ km²
Annual Rainfall:
*Max:4427.6 mm,
 Min:562.3 mm*
Forest:
 242.72 ThHa

Kolab Basin

Catchment Area (Total): 20,427
km²
*Orissa:10,300, Andhra
 Pradesh:10,127*
District wise Area:
Koraput:4509, Malkangiri:5791
Major Tributaries:
*Karandi N., Potteru R., Sileru R.,
 Machhkund R.*



Population (2001):
1,108,684
Density: 107/ km²
Annual Rainfall:
*Max:3092 mm,
 Min:352 mm*

- Subarnarekha:** It originates near Nagri village of the Chhotnagpur plateau of Jharkhand. Total length of the river from its origin to its confluence with Bay of Bengal is 446.12 km, including 79 km inside Orissa. The prominent tributaries of the Subarnarekha are the following rivers: Raru, Kanchi, Damra, Karru, Kharkhai, Chinguru, Karakari, Gurma, Garra, Singaduba, Kodia, Dulunga, and Khaijori.
- Budhabalanga and Jambhira:** It originates from the Similipal range of hills on Mayurbhanj district and travels a total length of 198.75 km before it finally empties into the Bay of Bengal. The prominent tributaries of the Budhabalanga are Palapala, Sunei, Kalo, Sanjo, Deo, Gangahari and Katra. Jambhira: It originates from the Chandra Reseve forest in Mayurbhanj

district and travels a total length of 90 km before it finally falls in Bay of Bengal. The prominent tributaries of river Jambhira are Mahanti, Gulta, Surudi, Murli, Saan, Bans and Hansakara.

3. **Baitarani:** It originates from the Gonasika in the Guptaganga hills of Keonjhar district. The river traverses a total distance of 360 km and falls into Bay of Bengal. There are 64 large, medium and small tributaries, out of which 35 join on the left side and 29 join on the right side of the river. The main tributaries are Kangira, Ardei, Khairi Bhandan, Deo, Kanjhari, Sita, Musal, Kusei and Salandi. The Salandi originates from the Meghasani hills of the Simlipal in Keonjhar district. It flows a distance of 144 km with a catchment area of 1800 km².
4. **Brahmani:** It is the second largest river in Orissa. Two major rivers, the Sankh and the Koel, originate from the Chhotanagpur Plateau and join at Vedavyasa near Rourkela in Sundargarh district of Orissa to form a major river, Brahmani. The Brahmani flows through Sundargarh, Keonjhar, Dhenkanal, Cuttack and Jajpur districts in the Coastal Plains, and enters into the Bay of Bengal at Dhamra. The Brahmani is 799 km long. It has 45 major tributaries, of which the important ones are Sankha, Chandrinalla, Katangamundanalla, Rukura, Badjore, Kaunishnalla, Kalanalla, Usthalinalla, Chudakhainallah, Gohira, Chilanti River, Tikira, Singadajore, Bangaru River, Nandiranalla, Nigra River, Bangusinghanalla, Barha, Daunri, Kumaria, Kelua River, Birupa, Hansua, Kharsuan, and Patasala on the right side and Koel, Suidihi, Champalijore, Kuradihi, Amrudi, Korapani, Mankada, Ambahari, Samakoi, Gambhiria, Rajore, Indrajeet, Ramiala, Pandra, Kharasuan, and Daudi on the left side.
5. **The Mahandi:** It originates from the Amarkantak hills of the Bastar Plateau near Pharasiya village in Raipur district of Chhattisgarh. The river traverses a total distance of 851 km (in Orissa - 494 km) and falls into the Bay of Bengal. The major tributaries of Mahanadi are Ib, Ong and Tel.
6. **The Rushikulya:** It originates from the Rushyamala hills of the Eastern Ghats in Kandhamal district and flows in the southeast direction and falls into the Bay of Bengal near Chatrapur. The prominent tributaries of the river Rushikulya are Padma, Boringanalla, Joro, Badanadi, Baghua, Dhanei and Ghodhado. It has no delta in its mouth.
7. **The Bahuda:** It originates near Village Luba from the Singhraj hills of the Eastern Ghats in Gajapati district. It flows in the northeast direction up to 55 km, and southeast direction for 17 km in Orissa before entering Andhra Pradesh to flow for 18 km. Then it turns in the northeast direction for 6 km in Orissa before meeting Bay of Bengal near the Village Sunapurapeta in Orissa. The river traverses a total length of 96 km and the prominent tributaries are Poichandia, Bogiriadi, Batrada Nalla and Kantajura Nalla.
8. **The Vamsadhara:** It originates from the flanks of the Durgakangar hills (Lingaraj hills) of the Eastern Ghats in Kalahandi district. The river traverses a total distance of 239 km before it finally meets the Bay of Bengal in Andhra Pradesh. The prominent tributaries of River Vamsadhara are Bhangi and Pedagoda on the right side and Badanalla, Chauladhua, Pandaka Nalla, Badajhar, Harbhangi, Sananadi, and Mahendratanaya on the left side.
9. **The Nagabali:** It originates from the Bijipur hills of the Eastern Ghats near Village Lakhabalal in Kalahandi district. The total length of the river is 217 km, of which 125 km lies in Orissa and remaining portion in Andhra Pradesh. The prominent tributaries are Pitadar Nalla, Datteibanna Nallah, Sananadi, Barha Nadi, Baldiya Nadi, Sat Nallha, Sitagura Nallha, Ghora Nalla, Sitaghera Nalla, Srikona Nadi, Bonamarha Nadi, Errigeda Nallha, and Jhanjhabati River.
10. **The Indravati:** It originates from the Eastern Ghats of Dandakaranya range in Kalahandi district and flows in a westerly direction; enters into Jagdalpur district in Chhattisgarh state. It further traverses in the westerly direction and thereafter in the southern direction

before finally meeting River Godavari at the border of Maharashtra, Chhattisgarh and Andhra Pradesh. The major tributaries of River Indravati are Keshadvara Nalla, Kandabindha Nallah, Chandragiri Nalla, Golagar Nalla, Poragarh Nalla, Kapur Nallah, Muran River, Bangiri Nallah, Telengi Nallah, Parlijori Nallah, Turi Nallah, Chourijori Nallah, Damayanti Sayarh, Kora River, Modang River, Padrikundijori River, Jaura River and Bhaskel River.

- 11. The Kolab:** It originates from the Sinkaran hills of the Eastern Ghats in Koraput district and finally meets Godavari in Andhra Pradesh. The prominent tributaries of Kolab are Karandi Nalla, Guradi Nalla, Kangar Nallah, Garia, Dharmageda Nallah, JamNadi, Malengar River, Mulervagu Nallah, Potteru Vagu Nallah, Machhakund River, Sileru River.

River Systems with a Drainage Area

Derived from the above information, as stated in the Government of Odisha records, the river systems and their drainage areas within the state are as follows:

Basin	Catchment Area		
	Total	Within Odisha	
	km ²	km ²	% to Geographical Area of State
Mahanadi	141134	65628	42.15
Brahmani	39116	22516	14.46
Baitarani	14218	13482	8.66
Budhabalanga & Jambhira	6691	6354	4.08
Subernarekha	19277	2983	1.92
Rushikulya	8963	8963	5.76
Indravati	41700	7400	4.75
Kolab	20427	10300	6.61
Vamsadhara	11377	8960	5.75
Nagabali	9275	4500	2.89
Bahuda	1118	890	0.57
Area draining directly to sea		3731	2.40
Total	313296	155707	100

Basinwise Ground Water Resources

According to the latest ground water survey released by the Government of Odisha, the geographical area of Odisha has been subdivided into 14 basins. A particular basin covers a number of blocks partly or fully. By proportionately integrating the estimated block-wise ground water resources and utilization figures, basinwise figures have been obtained with due rationalizations in order to minimize certain discrepancies. The following is a tabular representation of the basinwise groundwater resource in the state.

Sl. No.	Basins	Basin Area (km ²)	GW Resources (HM)
A.	Rivers		
1.	Bahuda	890	11023
2.	Baitarani	13482	167215
3.	Bansadhara	8960	72402
4.	Bramhani	22516	198033
5.	Budhabalanga	4838	83957
6.	Indravati	7400	55912
7.	Jambira	1516	38634
8.	Kolab	10300	75343
9.	Mahanadi	65628	685477
10.	Nagabali	4500	26167
11.	Rushikulya	8963	117910
12.	Subarnarekha	2983	59855
B	Direct to Sea		
13.	Kansabansa	1483	49614
14.	Chilika	2248	27372
	STATE TOTAL	155707	1668914

GW = Ground Water, HM = Hectare Metre

Odisha's rivers are under severe threat now. Loads from industries, mining and urbanization are spelling disaster on the rivers. Most importantly, the bias towards industries in water allocation is making the situation worse. Baitarani River Basin is one of the most stressed basins in the state.

The River in Study: Baitarani

River Baitarani is one of the important rivers of Odisha and is the third largest river in the state. The river drains an area of 14218 km². The catchment area of the basin is oval-shaped. The basin area spreads over eight districts of the state, namely, Keonjhar, Bhadrak, Mayurbhanj, Jajpur, Kendrapada, Sundergarh, Balasore and Angul. But the major concentration of the river, i.e., 48.95% of district area is covered by the basin of River Baitarani in the Keonjhar district, followed by 31.96% in Mayurbhanja district.

River Baitarani originated from Guptaganga hills in the Keonjhar district of Odisha, about 2 km from Gonasika village at an elevation of 900m and at a latitude 21°-31'-00" and longitude 85°-33'-00"E. The river travels a total length of about 360 km before it joins the Bay of Bengal. The total basin area of the river is 14218 km² which covers a total of 13482 km² of area within the state of Odisha. The river traverses at the border between Jharkhand and Odisha for about 80 km. At the origin, the river flows in the northerly direction for about 80 km and then takes a 90° turn and flows eastward. An area covering 736 km² of Singhbhum district in the Jharkhand state lies in the upper part of the basin. The river has 31 sub-basins. It is joined by 9 large tributaries and 55 smaller ones, the largest of which is Salandi with a drainage area of 1800 km².

Climate of Baitarani Basin

The Baitarani Basin spreads over the Singhbhum district of Jharkhand state and Keonjhar, Angul, Mayurbhanj, Sundergarh, Kendrapada, Jajpur, Balasore and the Bhadrak district of Odisha. The upper Baitarani Basin is at 700m above sea level and far away from the sea. Here, the climate is extreme in

nature. The middle Baitarani is partly hilly and partly plain while the lower Baitarani is in the coastal area. The climate of the entire basin is of tropical monsoon type.

As in all river basins of the state, the rainfall of Baitarani Basin varies widely in time and space due to its topographical position. The major rainfall the basin gets is mainly due to the Southwest monsoon which is active from June to October. About 80% of annual precipitation occurs during these months. The annual rainfall varies from a minimum of 642 mm at Patna in 1996 to a maximum of 3094 mm at Keonjhar in 1990. The average annual rainfall received by Baitarani River is 1488 mm. The hydrological analysis established the average annual river inflow to be 7.296 billion m³.

The surface water quality of Baitarani Basin is better compared to that of other basins. As described by the Bureau of Indian Standard No. 2296/92, the quality standard indicates River Baitarani's best use of water. The river water has been classified as Class "C" on the basis of this standard, which means that Class C is defined as a drinking water source with conventional treatment and disinfection.

Present Water Quality Status of Baitarani River

River water is found to be highly turbid, have suspended and dissolved solids, and have high temperature. The presence of high amount of metal ions, major anions and cations are alarming the stations close to the coastal areas. The industries, mines and settlements are polluting the river as well. The pollution at the Dhamra and Chandbali downstream reaches is mainly due to the backwater effect of sea in the coastal region.

Population and Development Status of Baitarani Basin

According to the 2011 census, the population of the Baitarani River Basin was 3,829,931, of whom the 3,446,088 was a rural population comprising 89.98% of the total basin population. The population density was 269/km² as per the 2001 census.

Irrigation:

Water resources development in Baitarani Basin for irrigation purposes started more than a century ago. The development of irrigation in the basin and the Baitarani irrigation system were constructed as drought relief measures in the Jajpur and Bhadrak districts through the construction of weirs across Baitarani and at its branch Budha at Akhupada during the period 1871 to 1879. From Budha weir, Jajpur main canal takes off and irrigates about 13100 ha. during Khariff season. From Baitarani weir high-level canal, Rangev III takes off to provide irrigation to 196000 ha. during Kharaff season in Jajpur and Bhadrak districts. Afterwards, four major irrigation projects were completed such as the Salandi, Kanjhari, Remal and Baitarani systems. Two projects are ongoing. There are 11 proposed projects to be done.

Sl. No.	Name of the Existing Project (As of Year 2003)	Design Ayacut
1	Salandi	92,000 ha
2	Kanjhari	9,800 ha
3	Remal	3,900 ha
4	Baitarani system	32,700 ha
Ongoing Medium Project		
1	Kanpur	29,578 ha
2	Deo	9,570 ha

(Source: 3rd Spiral study report of Baitarani Basin plan)

Major and Medium Projects of Baitarani Basin

Major and Medium projects	Numbers	CCA (ha)	CCA-Khariff (ha)	CCA-Rabi (ha)
Competed Projects	4	138400	114440	21361
Ongoing Projects	2	39148	34120	23184
Proposed Projects	11	151500	146306	87180
Total	17	329048	294866	131725

Source: Baitarani Basin profile, 2010

Distribution of Net-Sown Area of Baitarani Basin (Present and Future)

Year	Major & Medium Project	Minor Irrigation Project	Lift Irrigation Projects	Other Sources	Total	Net-Sown Area	Rain-fed Area
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)
Present	114440	19970	50576	37610	221696	604270	382574
Future	294	74887	53105	40531	463389	604270	130661

Sources: Baitarani Basin profile, 2010

Hydropower

At present, there is no hydropower project in the basin. By 2003, there were 4 proposed projects to construct power generation structure that would generate hydropower in the basin. These are listed below.

Future Major Hydropower Potential of the Basin

Sl. No.	Proposed Project	Installed Capacity (MW)
1	Rajnagar (Bhimkunda) dam	345
2	SimKantamuli dam	5
3	Musal	72

Apart from this, there is a proposal for 4 mini-hydropower projects in the basin having a total installed capacity of 83 MW. All the proposed projects are located in Keonjhar District. None of the projects has started yet.

Future Mini-Hydropower Potential of the Basin

Sl. No.	Name of Project	Promoter	Date of MOU signed	Installed Capacity (MW)
1	Upper Baitarani, Keonjhar	M/S Tarini Hydro Energy Pvt. Ltd., Bangalore	30.05.07	25
2	Middle Baitarani, Keonjhar Dist.	M/S Bhimkund Baitarani Power Projects (P) Ltd. Bangalore	30.05.07	25
3	Salandi Dam Toe, Keonjhar	M/S Salandi Hydro Power Projects Pvt. Ltd., Bhubaneswar	31.03.05	9
4	Lower Baitarani, Keonjhar	M/S Baitarani Power Project, Bhubaneswar	11.07.05	24

Industrial Water Supply

The water requirement for industrial development assumes greater importance in basin planning. There were 10 different industrial centres in the basin in 2003, which increased to 15 in 2010. The total industrial water requirement of the basin is calculated as 80.123 cusec in 2010.

Existing Industrial Centres in Baitarani Basin (2003)

Sl. No.	District	Industrial Centres
1	Bhadrak	Ferro Alloys Corporation Limited, Randia
2	Keonjhar	IPITATA, Sponge Iron Plant, Joda
3	Keonjhar	Kalinga Iron Works and Spun Pipe Plant, Matkambeda
4	Keonjhar	Orissa Sponge Iron Plant, Palaspanga
5	Keonjhar	Tisco, Brahamanipal
6	Keonjhar	Orissa Tea Plantation limited, Keonjhar
7	Keonjhar	Barar Vanaspati Industries, Ramachandrapur
8	Keonjhar	Tisco Fero Manganese Plant, Joda
9	Mayurbhanj	Utkal Wood products, Joshipur
10	Jajpur	Ferro Chrome Plant, Byasnagar.

Existing Industrial Centres in Baitarani Basin (2010)

Name of Industry	Status	Product	Requirement of Water in cusec	Allotment Status
1	2	3	4	5
Tata Steel Ltd.	Existing	Mining and Beneficiation	7.840	Under process
Tisco, Joda	Existing	Mines	2.415	Allocated
Tata Sponge Iron Ltd.	Existing	Sponge Iron	5.390	Allocated
M/s Sarda Mines Pvt. Ltd.	Existing	Mines	0.330	Allocated
Rio Tinto	Existing	Mines	12.260	Allocated
Orissa Sponge Iron Ltd.	Existing	Mines	0.040	Recommended
Tata Steel	Existing	Steel	15.680	Recommended
OMC, Gandhamardan	Existing	Mines	0.079	Allocated
Pattnaik Steel & Power Ltd.	Existing	Pelletisation	5.880	Recommended
Brahmani River Pellets Ltd.	Existing	Pelletisation	4.700	Allocated
Jindal Steel & Power	Existing	Iron Ore Beneficiation	14.710	Allocated
M/s Orissa Sponge Iron Ltd.	Existing	Sponge Iron	6.620	Recommended
Bilati Orissa Ltd.	Existing	Mines	0.010	Allocated
OMC, Daitary	Existing	Mines	0.249	Allocated
TISCO Ferro Alloys	Existing	Ferro Alloys	3.920	Allocated
	Existing		80.123	

Thirty-one (31) more industrial establishments were proposed in the Batarani River Basin, and the water requirement of these industries are 407.415. Apart from these large- and medium-scale industries, there were an additional 837 small-scale industries by 2010.

Industry	Status	Product	Water Requirement in cusec	Allotment Status
1	2	3	4	5
Nilachal Ispat	Proposed	Mines	0.25	Under process
Sree Metalics Ltd		Mines	0.061	Under process
Bhanja Minerals Pvt. Ltd		Mines	0.034	Under process
M/S Roida 'C'(IDC)		Mines	0.130	Under process
M/S N.Ram & Co for Roida-11 Iron Ore Mine in Keonjhar		Mines	0.055	Under process
Kusaleswar minerals		Mines	0.012	Under process
Dr. Sarojini Pradhan Minerals		Mines	3.430	Under process
Cracker India Alloys Ltd.		0.5 MTPA ISP	7.850	Under process
Naibang & Katupali Iron Ore Mines		Mines	0.020	Under process
Hari Machines Ltd.		Iron ore processing	0.300	Recommended
Ocean Ispat Pvt. Ltd		steel	5.880	Under process
Sree Metalics Ltd		Steel plant & iron ore beneficiation	8.380	Under process
Narayani & Sons		Mines	0.390	Under process
Welspun power and steel ltd		Iron ore beneficiation	5.100	Under process
Sarda Mines		Iron ore beneficiation	24.520	Under process
Tata Steel Ltd.		Iron ore processing	12.210	Under process
Kalinga Mining Corporation		Mines	0.000	Under process
Essar Steel Orissa Ltd.		Iron ore beneficiation	11.770	Recommended
Uttam Galva Ltd.		Steel	35.026	Under process
Kusum Powerment Pvt. Ltd		Power	2.450	Under process
Essel Mining		Mines	0.328	Allocated
Sterilite Iron & Steel Company Ltd.		ISP	95.160	Under process
MSP Sponge Iron		Sponge iron	1.962	Under process
Shree Jagannath Metallik Industries Ltd		Sponge iron	1.470	Under process
M/S Arcellor Mittal India Ltd.		ISP	140.000	Under process
Vishaka Thermal Power Pvt Ltd.		Power	44.000	Under process
Essel Mining & Industries Ltd.		Mines	2.450	Under Process
FACOR Power Ltd.		Power	1.800	Allocated
M/S Apeejay Surendra Group		Port	0.327	Under process
Larsen & Tourbo Ltd.		Power		Under process
Dhamra Port Company Ltd.		Port	2.050	Alocated
		Total	407.415	

Mining Status of Baitarani Basin

The Baitarani Basin is a mineral-rich area of the state. Eight districts of Odisha come under the Baitarani Basin boundary and there are a total of 81 working mines spread over an area of 13880.91 ha by the year 2006-07. A total number of 6933 workers extracted 23966.79 (000) MT output, the value of which is 13,701,025 TRS.

Fisheries and Aquaculture

Fish production in Baitarani Basin in 2003 was 23518 MT, which was 9.05% of Orissa's production. Freshwater fish catch in the basin was 13983.54 MT during 2001-2002 and brackish water fish catch in the basin was 1064 MT during 2000-01. During 2005-06, the freshwater fish catch was reduced to 11756 MT whereas the brackish water fish catch increased to 1992MT.

Marine Fishery

The coast line of Baitarani Basin increased from 27 km in 2003 to 104.69 km in 2010. Total marine fish landing at Baitarani Basin is 10.229 MT during 1997-98; 6973 MT during 1998-99; and 26609MT in 2005-06.

Baitarani and IWRM

The Government of Odisha, with the support of the Asian Development Bank (ADB), has been engaged in water governance reforms programme in the Baitarani River Basin through IWRM. However, from the initiation, this project has remained in controversies.

In fact in December 2010, the Water Initiatives Odisha (WIO) had organised a state-level consultation to build a "People's Agenda on IWRM," in which about 100 people, including farmers, fishermen, civil society groups, academia, media and other sections of the society, participated, deliberated and rejected the IWRM proposal of the Government of Odisha in its present form. The WIO strongly pointed out several technical faults and loopholes in the document (Refer to Box: Believe us, we are best managers of our water resources). We warned that such plan was actually meant to serve the interest of the mining and industrial houses rather than the people of the state and the rivers' ecology, including the wildlife which are dependent on the rivers.

"Believe us, we are best managers of our water resources"



A large number of farmers conveyed an agenda to the Government of Odisha in India in a public consultation entitled "Integrated Water Resources Management in Odisha: A People's Charter."

SAMBALPUR, 22 Dec 10 -- Farmers in Odisha, India proposed a water management and governance system of water resources by the people themselves instead of the one being pushed by the Government of Odisha under a technical assistance (TA) from the Asian Development Bank (ADB).

In a day-long public consultation organized by Water Initiatives Odisha (WIO), the said TA report entitled "Institutional Development of Integrated Water Resources Management in Orissa: India," was put on

the table for a thorough discussion and dissection. After discussing the TA, the farmers, who attended from remote and far-off villages and also from command areas of irrigation projects, along with academicians, researchers and civil society organization representatives, rejected the ADB's proposed Integrated Water Resources Management (IWRM) plan for Odisha.

"We, the people of the state, are capable of designing and implementing our own IWRM and we propose to do this through our own structure like 'River Parliaments' for each river basin and a state-level 'Water Parliament' for the overall management of water resources of the state," voiced the participants.



The participants urged upon the governments of Odisha and India not to consider industries as a stakeholder in water plans and decision-making. They further emphasized that water is an ecological resource and is a fundamental right of the people of the state. No external agency but the people of the state should be its owners. This can be ensured through the formation and strengthening of River Parliaments, which resolve at the end of the consultation.

"At a point of time, when more and more farmers are resorting to committing suicides owing to farm distress fuelled by water shortage and climate change, the proposed IWRM plan will bring further disasters to the farming community as the plan proposes cost recovery mechanism as the only solution to water management and favors corporate control over water resources," said Ranjan Panda, convener of WIO, who coordinated the organizing of this consultation.

All the speakers emphasized the guaranteed right of the people of the state over its water resources. The TA has been strongly rejected on the basis of lack of public consultation organized by the government on this important aspect of life.



"Neither people of the state nor the active farmers' organizations have been consulted. The report, which will impact the farmers the most, has only narrated concerns of the industries and the corporate," argued Mr Lingaraj, Convener, Paschim Odisha Krushak Samanwaya Samiti (a coordination organization of farmers' organizations of the state).

"This is clear-cut evidence that the plan is to smoothen the path of unsustainable and blind industrialization the state is now carrying out at the cost of its own people and environment," vented Lingaraj.

IWRM is a concept that the world has learned from the age-old practice in India and others. The concept of IWRM is good but

the plan that is being pushed by the ADB in Odisha is actually biased towards industries and, if implemented, will ensure corporate control of water resources of the state.

"For a proper IWRM plan, you need to have complete and up-to-date data on the quality and quantity of water in the state for current as well as future year scenarios. However, the plan that the TA is prescribing is based on incorrect and insufficient data. This is not acceptable," said Panda.

"Water is not government's property as it has not created it. People of the state are traditionally the users, preservers and therefore the owners of it. The current system of decision-making by the government on water management is influenced by corporate interest and will lead to the privatization of water. We don't need external agencies to prescribe on water management. People of the state are capable enough to plan our own IWRM where the government and other technical agencies can, at best, play an assisting role. The government should stop playing a facilitator role for industries and should stop behaving as owner of water. It's only the watch group of it," said Saroj, Researcher and farmer activist.

Majority believed that this plan of the ADB will strengthen the privatization drive of water resources in the country that has began at the behest of the World Bank in 2001-2002 through its 'water consolidation project'.

In place of river basin organizations that is being proposed by the ADB, the public consultation resolved to urge upon the government to form river parliaments where people of the state will be the only stakeholders.

"In no circumstances should the industries be considered a stakeholder in the management plans. They are the predators as they not only extract water in unsustainable manner but also pollute it to irreparable extent," discussed the participants.

The consultation resolved to take the debate to the villages and make people aware about these dangerous plans of privatizing our water resources by the ADB and the government. The participants urged upon Water Initiatives Odisha to organize public consultations in each district of the state and push for participatory water management. A

people's agenda on IWRM was prepared that will be sent to the Government of Odisha, and will be discussed as well at various forums to garner further support for the recommendations made.

Source: <http://www.forum-adb.org/inner.php?sec=4&id=200&b=1>

Even while the date for receiving public comments on the IWRM document was open, the government went ahead with notification of the Baitarani River Basin Organisation (RBO). (Refer to Box: WIO asks Government of Odisha and ADB: "Why the rush in pushing IWRM and RBO?"). We again urged upon the government not to go ahead with the RBO in this river, which is already critically polluted and stressed due to mindless mining and indiscriminate withdrawal, for industrial use.

WIO asks Government of Odisha and ADB: "Why the rush in pushing IWRM and RBO?"

Sambalpur, 8 February 2011 – From recent newspaper reports, we came to know that the Government of Odisha is deciding to consult all stakeholders before finalizing the IWRM plan. We thank them for listening to us and this is a welcome step. However, their resolution dated 4th September 2010 on "Constitution of Baitarani River Basin Organisation" makes it clear that they have gone ahead with the realisation of this IWRM plan without any consultation. From the day when they made available the IWRM document to people who can only access internet, we at Water Initiatives Odisha(WIO) have been urging upon the government to ensure that they consult all the people to be affected by this plan and through proactive initiatives of organising consultations at all districts; disseminating the draft in Odia and through all other means that will ensure participation of the people. However, while the government has not yet done any of these, they have published this notification. This clearly indicates that they are in a rush to push the plan at the behest of the Asian Development Bank (ADB).

We call it ironical since a paper of ADB, written by Arnaud Cauchois, Senior Water Resource Management Specialist at ADB, has

categorically mentioned how earlier IWRM spirals of the state have failed because the decisions were top-down. We reproduce here a relevant portion of the paper for your reference. "The abortion of the second IWRM spiral with the withdrawal of the World Bank support revealed a lack of ownership and probably stakeholder awareness-building and consultation. As often in India, IWRM principles were introduced through a top-down approach. It was first promoted by the central administration, cascaded down to decision-makers at state level and eventually to the DOWR bureaucracy". We therefore urge upon the Government of Odisha to not displace people from the decision-making processes in critical issues such as water resource management. Water has already become a scarce resource in the state; preparing any management plan without proper consultation with all stakeholders will further fuel conflicts.

As per recent media reports, the ADB, as well as the government officials, have been maintaining that the government is independent when formulating its own plans and that the Government of Odisha is not influenced by any outside organisations. However, the same paper of Arnaud Cauchois narrates how the earlier reforms

were supported by World Bank, and how the latest IWRM spiral is being supported by Asian Development Bank. The paper by Arnaud says, "The Orissa Integrated Irrigated Agriculture and Water Management Investment Programme (OIIAWMIP) is one of the most recent initiatives. The Programme of around US\$158 million started in 2008 and will be implemented over a period of 10 years. It combines irrigation infrastructure rehabilitation and upgrading with institutional reforms, including support to the Orissa State Government in the establishment and operationalization of IWRM. For this purpose, the Baitarani River Basin was selected for piloting the establishment and operationalisation of IWRM, including a river basin organisation that could later be replicated to the other states' river basins. The pilot is still at an early stage between the identification and conceptualization of this new development phase of the basin". We urge upon the government and ADB to come clear on this and to take such crucial decisions with proper consultation with the people of the state.

We once again call upon the government not to hurry on the IWRM and Baitarani RBO formation without proper study on the present and future water availability and quality scenario. In response to our reaction to the fact that this current Technical Assistance report on IWRM by ADB's

consultants was based on old data making it technically flawed, the ADB has responded to us on the 8th of January, confirming our apprehensions about accuracy of data to be true. We are reproducing below the relevant portion of the letter from ADB. "We agree that any reform process towards improving WRM should proceed with accurate, reliable, and updated data and information. While efforts were made by the consultants to collect the latest data from DOWR, this was not easy given the limited time frame. We are suggesting that DOWR provide necessary data during the further process, and are hopeful that this will be done." In fact, in December, WIO organised a public consultation on the proposed IWRM where farmers, civil society representatives, academia, water experts and others concerned from all across the state participated and rejected the current TA on this and several other grounds (We are attaching this, as well as our previous releases on this issue, for your kind information).

Once again, we urge upon the government not to rush with any such plan without making available proper data on the current water availability and clear-cut future projections, considering all sectors, and taking into account climate change scenarios. The current plan fails miserably on all those counts and hence cannot be accepted.

Source: WIO Release

In Baitarani River, farmers and other dependent communities and species, including the trees and wildlife, are fighting a losing battle for their rights over the water even though the RBO has not yet been established, perhaps because the government found reasons in the crucial issues we have raised since the beginning. As yet, we are not sure how the government has moved ahead with the plan, but the issues remained as critical as they were. In Baitarani as well as in other rivers of the state, we have witnessed how, in the absence of a proper management plan and its implementation, the floods in our rivers are becoming more devastating; (**refer to succeeding Box for an analysis of man-made floods in Odisha by WIO**) and how mining and industrialization are taking away more and more water – both due to faulty allotment principles and illegal withdrawal by such profit-making groups, at the cost of farms, farmers, fishermen, and most importantly the river itself including the biodiversity it supports.

Man-Made Floods in Orissa - Key Issues Raised by Water Initiatives Orissa

Orissa was hit by two spates of flood in September 2011, the first one being caused by heavy rains in the Mahanadi Catchment and release of huge discharges from Hirakud Dam. The second one was caused by heavy rains and flooding of Brahmani, Baitarani and Budhabalanga rivers. These floods point to the loopholes in river basin planning and management and calls for urgent attention of planners and policy makers.



Image courtesy: The Hindu

The sheer scale of the flood can be judged from the fact that "nineteen of the state's 30 districts are affected. Initial calculations by the state government reveal that almost 4.5 million people -- more than 11% of Orissa's total population -- have been directly and significantly affected. Crops on 4.78 lakh hectares of land -- nearly 7.5% of total cultivable land have been destroyed. At least 68 deaths have been reported so far. More than 2,900 km of road have been damaged. Thousands of affected people are still desperate for food (Ranjan K Panda, InfoChange, October 5, 2011)."

We present here some of the issues that have been raised on Orissa floods by Water Initiatives Orissa (WIO) through its press releases and updates in the recent weeks. The updates present analytical write-ups on the situation, latest news on impact of floods and relief rehabilitation measures. They also present an analysis of the water storage and rainfall situation on various dates, most of which point to the lapses in dam management.

Hirakud Dam failed miserably in managing Mahanadi floods

Flood Update II of WIO has a lead article titled "How effective are big dams in managing floods?" which presents important observations by scholars and experts on big dams. It states that the floods of 2011 exposes not only how the Hirakud Dam, the largest reservoir in Orissa and a multipurpose dam commissioned in 1958 in Sambalpur for, among other things, controlling floods in the state's delta region, has failed miserably in managing floods.

Both Orissa and Chhattisgarh must understand that Mahanadi needs to flow unabated and a lot has to be done regarding flood plain management including in urban habitations. Large dams have never been effective in flood control. Rather, they have always aggravated the impacts.

In a recent move, the Governor of Orissa has asked the state government to investigate the alleged mismanagement of Hirakud Dam through setting up of a committee to be formed under the chairmanship of a former Central Water Commission (CWC) Chief.



Image courtesy: Firstpost

Rengali Dam: Absence of reliable systems of flood forecasting

The Rengali Dam, the second largest reservoir in Orissa, was built across Brahmani River in Angul district in 1988. Through a special note, WIO discusses how the multi-purpose project writhes through controversies during each flood. Further, the incomplete canals have also added to the woes as water from the reservoir could not be drained out faster than envisaged.

At the crux of it, the dam authorities should never have allowed so much water to stay in the reservoir preceding the recent floods till the last moment, leading to devastation of about half a million people by design.

Effective flood mitigation through Rengali Dam requires proper information well in advance about the flow conditions upstream as well as downstream of the dam. The Rengali Dam releases travel in about 20 hours to the delta, which is only slightly less than the basin lag of the uncontrolled areas (about 24 and 30 hours for Brahmani downstream of Rengali and Baitarani, respectively).



Image courtesy: Orissa Spider

Need for a flood management policy

The case of Rengali suggests that it's time the state government comes up with a flood management policy which is not only technically advanced by integrating climate change scenarios but also transparent and involves all sections of the society through proper river basin management, reservoir operations and flood plain management activities.

Some specific suggestions put forth by WIO include –

- The first thing we need to understand is that we have to live with floods. All the mechanisms of better flood management practices, flood control measures, flood preparedness activities and flood forecasting practices depend on a reliable data transmission and telemetry system. Time has come that the government catch up with the scientific practices for better flood forecasting, flood control and flood mitigation measures.
- Regular and continuous study of river morphology, hydrology and necessary changes due to climate change and other phenomenon needs to be done so as to keep updating the flood management practices. The upper as well as lower catchments should have well-defined stations for recording river discharge and water levels.
- Having interstate agreements for all interstate rivers for a proper mechanism of flood information-sharing.
- Flood inundation area demarcation in the whole state
- Flood plain zoning regulation should be implemented.

Greater coordination with Chhattisgarh needed

The Government of Orissa put the responsibility of the flood on the heavy rain in the upper catchment and release of water from Chhattisgarh. However, daily and weekly predictions by the IMD were continuously warning of heavy spells. It proves that the dam management authority has not been following a coordinated approach with Chhattisgarh and IMD.

The Government of Orissa, which has been aggressively pushing for water sector reforms through Integrated Water Resources Management (IWRM), needs to also understand that Mahanadi belongs to Chhattisgarh as well and that the latter has to be taken on board.

WIO demands that “it’s time the Government of Orissa establishes proper communication and clearly defined coordinated action with Chhattisgarh on management and planning of Mahanadi River. It also demands that the Government of Orissa must, without any further delay, enter into a legally binding ‘water management and basin planning treaty’ that will help in management of Mahanadi water throughout the year.”

Disaster Management Authority caught unawares

In spite of being one of the first states to have a Disaster Management Agency in place, the state has virtually failed in both predicting and managing the floods.

Need for flood plain zoning

A press release from Water Initiatives Orissa (WIO) dated September 13, 2011 highlights the need for a participatory discussion on the National River Regulation Zone and a proper notification that helps in river basin planning and management.

It urges the Government of Orissa to immediately enact legislation on the lines of the model bill on flood plain zoning that was circulated way back in 1975 by the Central Water Commission. The bill was meant to be taken up by state governments as a model for freeing flood plains from encroachments.

The model bill provided clauses about flood zoning authorities, surveys and delineation of flood plain area, notification of limits of flood plains, prohibition of the use of the flood plains, compensation, and most importantly removing obstructions to ensure free flow of water. However, 36 years have passed and the state government has not brought it into action.

As an immediate measure, before this process takes place, WIO urges upon the government to issue strict circulars to all urban bodies of the state to remove encroachments from flood plains by entering into ‘free prior informed dialogue and consent’ process with the would-be affected communities and by adhering to best rehabilitation packages.

The Government of India, under its Ministry of Environment and Forests (MoEF), had recently proposed to issue a river regulation zone notification to protect riverbeds from any harmful constructions in the future. The press release urges upon the Government of Orissa to take proactive action to persuade the Government of India to put this plan in public domain, initiate discussion with each state and the people of the country, and bring into force a strict river regulation zone which can help in proper river basin planning and management and hence help rivers from further dying and also in reducing flood furies.

Given that in this decade, the frequency of floods have increased and there have been five major floods, the state needs to draw lessons from its disaster-filled history. It is high time that it looks for ecological measures for flood management and bans construction activities on the flood plains altogether. It is only with these holistic measures that least damage to life and property can be ensured in Orissa.

Source: <http://www.indiawaterportal.org/post/20609>

Issues and Concerns on IWRM in Baitarani

In the December 2010 consultation, we had proposed the formation of River Basin Parliaments, with people of the basin as the major decision-makers and where government officials and other technical experts could help as advisers only. We had strongly opposed the inclusion of any mining, industrial and vested interest group in any decision-making body. We had also asked for updated information on water availability and had demanded a status paper of all rivers after conducting a thorough cumulative ecological assessment of the

carrying capacity of the rivers. However, nothing has been done so far, but the tempo and speed of signing MoUs with more and more water-guzzling and polluting industries is currently going on. In the current juncture, the people of the basin have once again strongly urged upon the Government of Odisha to form River Bain Parliaments instead of the proposed River Basin Organisations.

Some key issues in the Baitarani River Basin in relation to the IWRM proposal in Baitarani are as follows:

In the following sections, we write down WIO's preliminary submission to the Government of Odisha with concerns on the IWRM proposal and TA, which in fact still remain as concerns since the government and ADB have not yet addressed any of those.

- We feel that the time given for public comments is too short and, hence, we urge upon you to please extend it by at least six months.
- This is more so because the TA that you have uploaded on the net is affecting lives and livelihood of about 80 per cent of the state who are farmers and who do not have internet access and ability to analyse such huge reports in English.
- Having said that, we urge upon you to also publish this report in Oriya and organize district-level consultations in each district with all sections of the society, and with more emphasis on farmers. Unless this is done by the state government, this will remain a biased one.
- While we at Water Initiatives Odisha have gone through the report quickly and in this letter are giving the following *prima facie* and quick remarks, we are planning to hold a state-level consultation in which we shall invite farmers, academia, civil society organisations, experts in the field of IWRM, media and other concerned to discuss this further, and will submit our detailed response in a month or two. We would also appreciate if officials from your department and consultants of ADB can also participate in the said meeting and deliberate the plan further in clear terms. This would however be a very small effort compared to the number and nature of consultations required for such a gigantic plan and, hence, we once again urge you to organize consultations in each district before finalising any plan.

Our *prima facie* basic observations are as follows:

1. Prepared by consultants of the ADB, the "TA 7131 Institutional Development of Integrated Water Resources Management in Orissa: India" has been a biased report against the farmers. The Technical Assistance (TA) report is clearly in favour of corporate control of water resources in line with ADB's 'Water for All' policy formulated in the year 2001, which ADB wants to push through aggressively. The report, as clearly mentioned, has not consulted the farmers who will be affected most by its implementation, and the Government of Orissa has sought suggestions and objections to it for only about 27 days and through the internet at that. This calls for urgent rectification as this is keeping away farmers from participating in the process, considering the fact that most of the farmers live in rural areas without internet access. So, WIO calls this report and the process technically flawed and biased.
2. While the report recognizes that the threat to water resources is due to climate change, it fails in providing an exact status of water availability in the state at present as well as in future year scenarios. The report has mentioned that the per capita water availability in the state has decreased from 3359 m³ in 2001 to 3300 m³ at present. This is not supported by any reference material. Going by the average reduction statistics at the national level, as WIO has already pointed out earlier, the per capita availability would have decreased to 3000 cubic meter (cum) at least. However, in a state like Orissa, where the water-guzzling and polluting industrialization has increased by a large number especially after 2001, this would have gone further down. Similarly, its projection of water availability by the year 2050 to 2200 is also

flawed. While it has considered the IPCC warnings, it has missed out on the projections made by IPCC. The IPCC's projections say that the water availability will be reduced by another 40 per cent just by the year 2025. Considering this and the United Nations projections that say "by the year 2025 the demand for freshwater is expected to rise to 56 per cent above what currently available water can deliver," these calculations cannot be expected especially in a state which is planning to generate about 60,000 MW of electricity from coal-fired power stations in seven to eight years. This means that the heat in Orissa will be fuelled by both global and local warming and will lead to water stress. Therefore, we urge the Government of Orissa to reject this analysis of the ADB consultants and demand a fresh and realistic analysis of water resources. No water management plan can be realistic unless a proper status of water resources is made available.

3. The report talks about establishing a Water Regulatory Authority and full cost recovery of water tariffs from farmers. The experience of such authority in Maharashtra is already under severe criticisms from farmers and civil society groups for being influenced by corporate and rich users of water. Further, in Orissa too, the water reforms so far conducted in the name of establishing Water Users Associations have also been not successful, and the report does not analyse the evaluations already done on this aspect of the reforms. Under these conditions, we apprehend that the plan is actually to put in place systems that will help strengthen corporate control over water resources and, hence, we urge the Government of Orissa to ensure widespread dialogue involving all sections of the society before establishing the WRA and any River Basin Organisations.
4. We once again urge you to extend the deadline for seeking comments by at least six months and to organize thorough dialogues with farmers and others in all the districts of Orissa.

Views of Kendujhar Citizen's Forum (an active member of WIO) and other stakeholders, as compiled during discussions with them

In Kendujhar, in its 108 mines covering 290 km² of lease area spread all over, of which 180 km² is forest land, 24 sponge iron units, and over 250 ore crushers spread wide and deep into the rural interiors. The massive solid waste generated has to be left here in Kendujhar. The ores have to be washed clean before dispatch to steel centres and ports. That is where the equally massive need of water has been created, both for beneficiation and transportation.

Baitarani is the only robust source of our district, providing 95% of drainage of the district, and is the lifeline of the people, land and its ecology. Conflict was the natural outcome when the new stakeholder called 'industry' came into our fold. That is when the Asian Development Bank has been ushered in, to help the government help the 'special interest.' It could as well be 'World Bank' for all you know. The ADB-IWRM report was put on the web only for seeking public opinion, and no effort was made by the government to reach out to the basin population for a discussion on this.

Unfortunately for Kendujhar, the government has now upstaged this IWRM recommendation to officially "launch" the first Baitarani River Basin Organisation, the only one, as recommended by ADB in their final report on reformation.

Let us present some of the current water needs in the Baitarani Basin. Briefly, these are as follows:

- a. Kanupur Major Irrigation Project, scheduled for completion in March 2013, needs water for irrigation of 48,000 acres of land in upper Baitarani Basin.
- b. Anandpur Irrigation Barrage will irrigate 150,000 acres of land in the lower basin, in the entire north Orissa coastal plane, including Bhadrak, Jajpur, Balasore and Kendujhar districts.
- c. Minor irrigation projects numbering 79, existing lift irrigation points numbering 155, and 140 proposed for a total of about 55,000 acres in Kendujhar district alone.

- d. Domestic water supplies to 8 urban complexes and a host of riparian settlements in its 350 km journey.
- e. Thankfully, the proposed hydropower project at Bhimkund will not consume any water.
- f. Water for industry
- g. Slurry transportation and ore beneficiation are the two major users of water, totally depending on the Baitarani River. The former will use water (3:1 by volume) for piped transportation of ore fines to far-off Paradip, Kalinga Nagar, Angul, and others. For example, only 3 units have been approved to draw about 4300 KL of water per hour, i.e., over 100 MLD (million litres per day, or, 1.2 cumec).
- h. The proposed 30 million tons per year of steel production in Kendujhar (Arcelor Mittal, Sterlite, and Uttam Galva alone total about 26 MT/y), will also need water of unspecified quantity. If they bring current technology, they will need substantially less water because it will be restricted only to loss due to evaporation. The balance will probably be recycled.
- i. Since most of the steel industries will have their Captive Power Generation, and upstream and downstream industries, the need of water may be substantial.

Someone has to do the arithmetic of distribution to allay the serious anxiety of the people of Kendujhar. Will this distribution be fair on priority as laid down in the "State Water Policy," namely, domestic, ecology, irrigation, and industry? Anyway, the people have some idea about the dynamics of the river when its water is surplus during the 4 months of rains, and far too lean during deficient seasons. There is far too little effort to hold the post-monsoon runoff in the upper basin of Baitarani, and thus enrich the raw water source. There is a lot of wisdom in this, which the industry must understand before the attempt to redistribute the scarce resource. It takes a dangerous turn when water is treated as a raw material and merges with the input cost.

The Citizens Forum has written nine letters to the government during the last 6 months, mostly to CM, seeking a conclave of all stakeholders to discuss not only the peaceful and equitable distribution of water of Baitarani, but also ways and means to supplement the source by scientific methods. We have never received any reply whatsoever, except for a few kind audience granted by the Director of Hydrology and Water Planning.

Now, we find that the main and only recommendation of ADB, the creation of Baitarani RBO, has been upstaged, launched even before the date for seeking public opinion was over. Our nagging doubt now stands confirmed, that the entire exercise of ADB-IWRM was to push an agenda of the "special interest." It has left a bitter taste in the mouth, and a feeling that even our own government plays intrigues with the people in order to keep the 'super class' happy. We have to swallow that bitter pill because after all it is our democratic government, elected by us.

We are sure that the current form of IWRM is in fact a ploy to effectively control the water of Baitarani as a commodity for commercialization. So, we reject the ADB report, in favour of another study by our own experienced engineers, experts on water, and hydrologists, duly supported by a bipartisan civil society with adequate representation of all stakeholders. There is no need for such unethical hurry.

Recommendations from the Research

The government and ADB are using internet as the platform for consultations. The local people therefore find the internet as an enemy. The Baitarani IWRM plan as well as the proposed RBO should be discussed threadbare with the people of the basin – both riparian and non-riparian – and not just on the internet. Only then can any headway be made in any form.

The Baitarani IWRM must respect the local and indigenous knowledge and expertise of the communities in managing water and river. It should not only be managed with external advices which often favour the rich and the powerful.

The government should engage with the basin population in a sustained manner to discuss the issues and concerns of the basin and to take people into confidence in a transparent manner when devising the IWRM plan. The current IWRM plan must first be scrapped as it has been done with the help of external consultants hired by ADB who do not have any idea about the real issues and problems of the basin. They have only studied things in a superficial technical manner and have not consulted the people of the basin.

The people of the basin want democratic people-owned institutions to manage the river basin. The current form of the RBO proposed with ADB support is contrary to what the people need and, hence, must be scrapped immediately.

In none of the decision-making bodies on river basin management should the industries, corporate houses and other such powerful people – who use water as raw material for production and for mass profit – be involved in any leadership. At best, they can be consumers and must depend on the allocation done by people's organisations formed and operated in democratic ways. At no cost should the local farmers' organisations, fisherfolk bodies, Gram Panchayats, and tribal and other indigenous people's organisations be ignored. Rather, they should be made the primary stakeholders.

The basin management should not only be done in a riverbed management approach. Rather, the entire basin area and its catchment must be considered in planning and management. Because Baitarani is a heavily mineral-rich basin, mining activities should be restricted, keeping in mind the pollution load and other ecological impacts on the river as a whole. Similarly, cumulative ecological impact assessments must be done for all so-called development projects such as the establishment of industries and power plants and the urbanisation at the basin, and people-centric plans should be promoted accordingly. In all plans, water and ecology must be considered as having their own right to exist.

The basin is facing rapid forest degradation, and there is no coordination between the forest and water resources department in the basin planning and development. The government should immediately devise a mechanism to bring all the related departments into task, and the people's basin management organisation in the form of River Basin Parliaments should have these departments as their advisors. A coordinated action should be initiated with immediate effect to plan for the basin recharge through several measures like forest conservation, afforestation, surface water bodies' protection, watershed management, and the like.

The basin is especially facing an ill-conceived afforestation programme at the moment wherein natural forests are being cut and alien species are being planted. There are several places where, with support of the Japan Bank for International Cooperation, eucalyptus plantation is being promoted at the cost of local natural biodiversity forests. This should immediately stop.

There is an immediate need to recharge the basin with small water harvesting structures, to check dams and other such measures. The groundwater recharging efforts should also be taken up. Locals claim that at least 8 perennial streams feeding to Baitarani have died down already. Immediate action should be taken to bring them back to life. Or else, the already reduced Baitarani will die down soon.

The government authorities at the moment are biased towards industries and corporate houses

in allocating Baitarani water. This should change, and water allocation should be done, keeping in mind the priority listed in the Water Policy in which people and ecology should figure first. In the allocation of water to industries, the overall ecological impact on the basin as a whole should be the determining factor, not the investment and the MoUs that the government signs with the industries.

The rural areas as well as urban habitations should be provided with uninterrupted drinking water supply in adequate quantity and permissible quality.

Baitarani is heavily polluted now and it not only affects the human health but also the health of the domestic animals and wildlife. An effective pollution control plan must be integrated within the IWRM plan and should be immediately implemented. And for this to happen, no more industries should be permitted in the basin. Rather, based on a cumulative ecological impact assessment analysis, we propose that some industries be abandoned and mining activities reduced.

The people of the basin have every reason to worry that in another 4-5 years the river will die. Information available with members of the Kendujhar Citizens Forum say that industries are now allocated 1200 cubic meter/hr of water from the river. This is almost 700 times more than what the Kendujhar town people require for their domestic requirement. This is going to make the river die faster, they apprehend.

The Baitarani River Basin is facing critical pollution issues due to heavy mineral extraction. There is also a lot of illegal mining extraction in the river basin. All these add to the river's woes. Without bringing the miners to task, no basin management plan can succeed. The miners should be accountable and responsible to the people-centric basin management organisation that we propose to be formed.

Many industries are planning to use Baitarani water to transport iron ore and manganese ore to their plants that are hundreds of kilometres away. This should not be allowed as the basin itself is struggling to maintain even minimum ecological flow at the moment.

Concluding Note

In a consultation organised by WIO with support from NGO Forum on ADB and in association with the local groups working on the Baitarani River Basin, the voice of all the people of the basin was unanimously loud in saying "Baitarani belongs to the people of the basin, not industries. We want it back..."

The people of the basin have also urged upon the Government of Odisha to immediately scrap the year-old resolution to form RBO in Baitarani, which is yet to take off.

The RBO, formation of which was notified hastily in October 2010 without a proper consultation with the people of the basin and state, has been a bureaucratic-centric organisation without proper representation of the riparian communities. Hence, the people have rejected the RBO.

Despite all genuine concerns raised by WIO and the people of the basin, the government, last year went ahead with finalizing the ADB-supported IWRM document without taking serious efforts to involve the people of the state in decision-making. The internet was used as the only medium to invite public opinion and on the basis of this 'ghost participation process,' this plan has been approved.

The IWRM document was prepared with age-old faulty data and, hence, was technically flawed. The WIO and people of the basin have been urging the government to first assess the water availability of the basin for all peoples and species dependent on it at current and future level, and only then think about any IWRM plan. However, without any consideration to a scientific and proper assessment, the government has been going on allotting water to industries after industries as a result of which near to 90 per cent of the river water is now set to be sold out to industries alone.

Success of the IWRM process depends on accountability, transparency and people's participation. Unfortunately this is not happening here. So, the government and ADB should immediately start a participatory dialogue process with the people of the basin, if it is serious about managing the river water.

Industries who come here for a few years or decades can never be stakeholders of the river. The people of the basin oppose the idea of including any industrial houses in any decision-making body concerned with allocation of water. They are simply consumers and use the water as a raw material for their profit. Water for people is life and livelihood, but for the industries, it represents profit.

The people have further said that they are socio-economically and culturally dependent on Baitarani but the blind mining and industrialization process is killing it through excessive withdrawal of water and through pollution. The people want their right of the river protected and established by the government.

People of the basin have also voiced their concern that the industries have their own law in the basin, and that they openly flout government rules. The Essar Company has illegally constructed intake wells in Baitarani at Bansantpur, and has been laying pipeline to transport iron ore using water without any permission. The same has been done by the Brahmani Rivers Pellets Unlimited (BRPL) Company and many other companies. They have disobeyed stoppage and closure notice of the government and pollution control board and continue to do so. Many industries are 'water thieves' and do not pay water tariff. To protect the river basin, therefore, these industries need to be strictly shut down from here," urged the participants. They have also urged the government to protect the hills and forests from where rivers and streams have originated.

The people of the basin have demanded that the government immediately scrap all water allocation to mining and industries, and publish a status report on the quantity and quality of water in Baitarani; do a cumulative ecological assessment of the river, including the impact of industrialization so far; and then start a dialogue process with the people to design a people-centric water management plan.

The current IWRM plan of the government seems like a 'water allocation plan to industries.' What we need is for our rivers to live for centuries, providing drinking water to people and livestock, irrigation to more farmers, and many others.

People of the basin also want to form democratic and decentralized organisations to manage river basins as against the top-heavy bureaucratic-controlled structures. They want that discussions be initiated among villagers across the basin to form Basin Parliaments where people's knowledge about river water management will be documented and promoted; people-to-people network along the basin will be promoted; and pressure will be built upon the government to consider our genuine concerns.

INDONESIA

HEADING IN THE WRONG DIRECTION?

The Integrated Citarum Water
Resources Management Investment
Program (ICWRMIP) Case Study

HAMONG SANTONO
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ARIMBI HEROEPUTRI

I. Introduction

Water is not merely for life, it is life itself. It is the exact expression to use when trying to comprehend the importance of water. Not surprisingly, water has become one of the major development issues, at least in the last two decades. Various meetings at international and national levels have been frequently held to discuss water issues and the connection of these to other development issues.

In July 2010, the United Nations Organization (UNO) declared the access to clean water and sanitation as a human right. In 2000, the world leaders also agreed to include access to clean water and sanitation as one of the targets in the Millennium Development Goals (MDGs) to be achieved in 2015.

Global concern regarding clean water and sanitation issue is at least based on the fact that there are many people in the world (particularly the deprived/poor) who still have not had any access to clean water and sanitation. According to WHO (2010), in 2008, at least 900 million people did not have access to good clean water and 2.6 billion people did not have access to sanitation. WHO also added that diarrhea, which usually occurs as a result of inadequate clean water and sanitation condition, was the second biggest disease in the world.

Nevertheless, water issues do not only cover clean water and sanitation. The world has for a long time been seeking for solutions to the water resource issue. The year 1977 is recorded as the year of initial serious discussion regarding the water resource, which was held during the United Nations Conference on Water in Mar del Plata, Argentina. One of the recommendations from the conference was to urgently carry out assessments on the condition of water resources in the world. Since the conference, the water issue had then been absent from international debates, until later in January 1992 during the International Conference on Water and Environment which was held in Dublin, Ireland with its result the Dublin Principles¹.

Since the conference in Dublin, solutions for water resource problems began converging into one idea, i.e., Integrated Water Resources Management (IWRM), which initially came up in 1977. In fact, the World Bank immediately responded to the result of the Dublin conference and its connection to IWRM by drafting the paper on water resource management policy in 1993. *The Water Resources Management Policy paper marked a shift in the Bank's overall framework on water resources management – from fragmented to an integrated approach that puts together all four subsectors -- irrigation and drainage, water supply and sanitation, hydro-power, and environment -- under the umbrella of water resources management. The approach supposedly takes in consideration both the environmental and economic aspects of resources management. The environmental tone was undoubtedly inspired by the period's pressing global concern for the environment and the need to address the criticisms against the Bank's poor environmental management of its water infrastructure projects. The economic aspects called for cost recovery, productivity, efficiency and the introduction of water pricing or water rights to ensure that users take the financial and resource costs into account when using water.*

The World Bank's initiative was later followed by other international financial institutions, including the Asian Development Bank (ADB), where ADB made IWRM approach as the foundation in solving water resource problems, particularly in Asia.

Based on the background mentioned above, this paper is meant to, **firstly**, look at the history and conditions which provide the background to the birth of the Integrated Water Resources Management (IWRM) idea; **secondly**, to observe and analyze the role of international financial institutions in relation to IWRM; and **thirdly**, to observe and analyze the practice of IWRM in Indonesia, including taking stock of the situation occurring at the community level, particularly in the Integrated Citarum Water Resources Management Investment Program (ICWRMIP) project funded by ADB.

It is hoped that this paper will be able to provide assistance to policymakers, international financial institutions, and the civil society to get a better comprehension of the existing problems in

Citarum River management, so it can encourage the emergence of a better policy within that context, as well as enable assistance to civil society in carrying out campaigns related to the management of the river.

2. Integrated Water Resources Management (IWRM)

2.1. History of IWRM

"It is hoped that the Water Conference would mark the beginning of a new era in the history of water development in the world and that it would engender a new spirit of dedication for the betterment of all peoples; a new sense of awareness of the urgency and importance of water problems; a new climate for better appreciation of these problems; higher levels of flow of funds through the channels of international assistance to the course of development; and, in general, a firmer commitment on the part of all concerned to establish a real breakthrough so that our planet will be a better place to live in." (Mageed, 1977)

Such was the expectation expressed by Yahia Abdel Magged relating to the United Conference on Water held in Mar del Plata, Argentina in 1977. The conference was attended by at least 1,500 participants representing 116 countries, international institutions, and civil society organizations. The awareness about the potential problems relating to the water resources in the world at least began to emerge in the conference. *The conference approved the Mar del Plata Action Plan, which was the first internationally coordinated approach of IWRM. The plan had two parts: a set of recommendations that covered all the essential components of water management, and twelve resolutions on a wide range of specific subject areas. It discussed assessment of water use and efficiency; natural hazards, environment, health and pollution control; policy, planning and management; public information, education, training and research; and regional and international cooperation (Biswas, 2004). The Mar del Plata conference was undoubtedly a major milestone in the history of water resources development in the 20th century. Viewed from any direction, the conference has become an important yardstick in water resources management, particularly for IWRM. Regrettably, transboundary water resources management was not discussed comprehensively and an implementation scheme for the action plan was not developed during the discussion.*

After Mar del Plata, water issue was once again missing from the international agenda until 1992 when International Conference on Water and Environment was held in Dublin, Ireland. The conference's output was the Dublin Principles, which consisted of four main principles in water resource management, namely: (1) recognition of fresh water as a finite, vulnerable, and essential resources and suggested that water should be managed in an integrated manner; (2) adoption of a participatory approach involving users, planners and policymakers at all levels of water development and management; (3) recognition of women's central role in the provision, management, and safeguarding of water; and (4) suggestion that water should be considered as an economic good.

Although there were numerous controversies that emerged, particularly those relating to the fourth principle, nevertheless it had to be admitted that current thinking regarding the crucial issues of IWRM is heavily influenced by the Dublin Principles. Hereinafter, various international meetings such as the World Water Forum, the International Conference on Freshwater, and the like attempted to discuss IWRM and make IWRM as an internationally accepted water policy tool.

2.2. International Financial Institutions and IWRM

Support for IWRM approach can be seen from the policy as well as the strategy issued by international financial institutions. The World Bank, for instance, issued a water resource management policy paper in 1993. The main thrusts of the World Bank's 1993 Water Resources Management Policy Paper were consistent with the global consensus (embodied in the Dublin Principles forged at the 1992 Earth Summit process and re-affirmed thereafter) that water resources should be managed

holistically and sustainably, respecting subsidiarity, ensuring participation and treating the resources as an economic as well as a social good. Based on the review of the Operations Evaluation Department (OED), the goals of the 1993 policy paper remain relevant and appropriate, but the progress has been slow in getting actions on the ground.

Therefore a decade after the issuance of the policy paper, the World Bank issued the Water Resources Sector Strategy. The World Bank stated that *this strategy does not aspire to rewrite the policy paper, but to complement it by focusing on the lessons in translating its principles into practice. The strategy does not focus on the water-using sectors but on water resources management and the connections between resource use and service management. There were at least four points of the strategy to be dealt with, namely, institutional framework, management instruments, the development and management of infrastructure, the political economy of water management and reform.*

Similar action was also carried out by the Asian Development Bank (ADB). In 2001, ADB issued their policy for the water resource sector, which is known as the “Water for All Policy.” Through the policy, ADB explained the priority, commitment, and strategy to be done for the development of water sector in the Asian region. In 2005, ADB reviewed their water policy, and as a result, the “Water Financing Program” was issued in 2006 which essentially was ADB’s effort to multiply their investment in the water sector up to 2010. There were three sectors which served as ADB’s funding focus in the water sector, namely, the suburban area, urban area, and rivers. Specifically for rivers, ADB would assist in introducing IWRM in 25 rivers in the Asia-Pacific region.

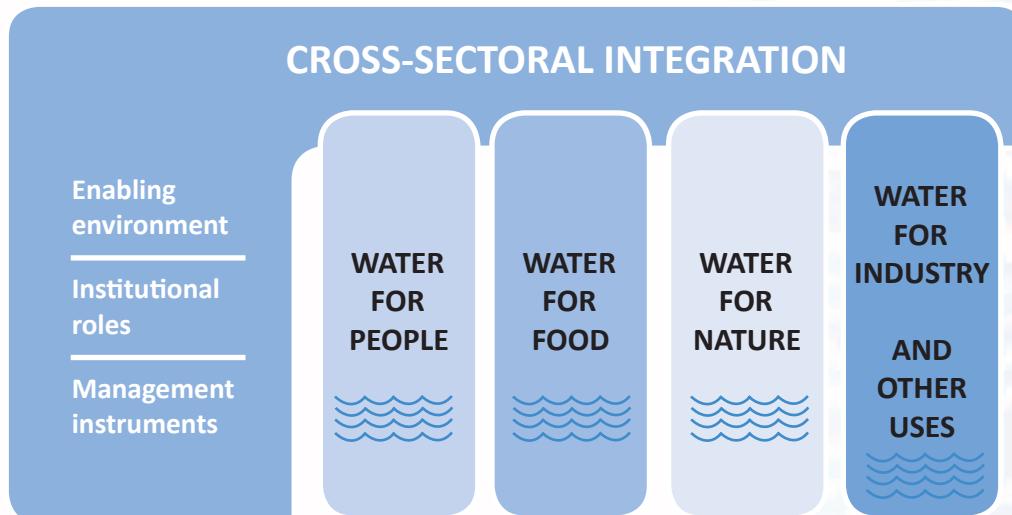
2.3. Definition of IWRM

The practice of water resource management has been carried out for a long time, along with the development of human civilization. There are at least three periods in water resource management, i.e., the sectoral approach period, the cooperative approach period, and the IWRM management-oriented, IWRM goal-oriented, and capacity building for IWRM period. The sectoral approach is the common approach used from approximately 1820-1950s. Each sector involved in water and water issues does its own planning and implementation except when the sectors overlap responsibilities. There are, therefore, separate: (1) planning and implementation process, (2) activities and tasks (such as water storage, transmission, distribution and allocation), (3) physical and construction measures (water canals, dams, and reservoirs), (4) legal and economic instruments such as regulations and incentives, and (5) institutional and organizational requirements.² The next period was dominated by the cooperative approach (1960-1970s) which involved cooperation among the many agencies involved in planning and activities in the water sector improvement. There are some joint planning and joint activities with two or more agencies or stakeholders, even when their legal responsibilities do not overlap. As it became clear that these plans, activities, regulatory activities, regulatory activities and legal and economic frameworks intersected, ad hoc cooperative efforts became common. The features of these cooperative efforts were: (1) joint planning processes for two or more agencies or stakeholders, (2) rationalization of certain activities, (3) interactions to improve regulatory and economics frameworks, and (4) better institutional cooperation. The third period was the IWRM period which can be divided into three orientations, i.e., management-oriented, goal-oriented, and capacity building for IWRM. This period began in the 1980s and continues up to the present day.

Global Water Partnership (GWP) defines IWRM as “a process which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.” Furthermore, according to GWP, IWRM helps to protect the world’s environment, foster economic growth and sustainable agricultural development, promote democratic participation in governance, and improve human health. Worldwide, water policy and management are beginning to reflect the fundamentally interconnected nature of hydrological resources, and IWRM is emerging as an accepted alternative to the sector-by-sector, top-down management style that has dominated in the past.

The basis of IWRM is that the many different uses of finite water resources are interdependent. High irrigation demands and polluted drainage flows from agriculture mean less freshwater for drinking or industrial use; contaminated municipal and industrial wastewater pollutes rivers and threatens ecosystems; if water has to be left in a river to protect fisheries and ecosystems, less can be diverted to grow crops. There are plenty more examples of the basic theme that unregulated use of scarce water resources is wasteful and inherently unsustainable.

IWRM and its Relations to Sub-sectors



Source: Global Water Partnership, <http://www.gwp.org/The-Challenge/What-is-IWRM/>

Integrated Water Resources Management is a cross-sectoral policy approach, designed to replace the traditional, fragmented sectoral approach to water resources and management that has led to poor services and unsustainable resource use. IWRM is based on the understanding that water resources are an integral component of the ecosystem, a natural resource, and a social and economic good.

Moreover, according to GWP, the IWRM approach promotes a more coordinated development and management of land and water, surface water and groundwater, the river basin and its adjacent coastal and marine environment, and upstream and downstream interest. It is also about reforming human systems to enable people to obtain sustainable and equitable benefits from those resources. For policymaking and planning, taking an IRWM approach requires that:

- water development and management take into account the various uses of water and the range of people's water needs;
- stakeholders be given a voice in water planning and management, with particular attention to securing the involvement of women and the poor;
- policies and priorities consider water resources implications, including the two-way relationship between macroeconomic policies and water development, management, and use;
- water-related decisions made at local and basin levels are along the lines of, or at least do not conflict with, the achievement of broader national objectives; and
- water planning and strategies be incorporated into broader social, economic, and environmental goals.

It has been broadly accepted and admit, both in national and international organizations, that the operation of IWRM can be in different forms and purposes. *Although the international organizations recognized the integrated nature of land and water, they focused on integrating different sectors of water resources, presuming that land management was an inherent component of water management. The World Bank conceptualizes IWRM as a "comb," in which the "teeth" are the water-using sectors and the "handle" is the resource itself, defined by its location, quantity and quality. This means addressing the following: institutional framework, the development and management of infrastructure, management instruments, and the political economy of water management and reform* (World Bank, 2004 – Water Resource Strategy Paper). The United Nations-Water (UN-Water was endorsed as the new official United Nations mechanism for follow-up of the water-related decisions reached at the 2002 World Summit on Sustainable Development and the Millennium Development Goals) encompasses all aspects of freshwater that include their quality and quantity, their development, assessment, management, monitoring, and use (including, for example, domestic uses, agriculture and ecosystem requirements).

Another United Nations agency, the United Nations Development Programme (UNDP) emphasises integrated approach to water resource management through effective water governance (UNDP, 2007; <http://www.undp.org/water/> accessed 23 October 2007). Water governance here refers to the range of political, social, economic, and administrative systems that are in place to develop and manage water resources and the delivery of water services at different levels of society. It comprises the mechanisms, processes, and institutions through which all involved stakeholders, including citizens and interest groups, articulate their priorities, exercise their legal rights, meet their obligations and mediate their differences. The European Commission's Sixth Framework Program identifies five forms of integration – vertical, horizontal, activity, sectoral and financial (Von Kerkhoff, 2005) -- to prevent the deterioration of aquatic ecosystem and to restore polluted surface waters and groundwater through river basin management.

GWP themselves stated that *whereas certain basic principles underlying IWRM may be commonly applicable, independent of context and stage of economic or social development, there is no universal blueprint as to how such principles can be put into practice. The nature, character and intensity of water problems; human resources; institutional capacities; the relative strengths and characteristic of the public and private sectors; the cultural setting; natural conditions and many other factors differ greatly across countries and regions. Practical implementation of approaches derived from common principles must reflect such variations in local conditions and thus will necessarily take a variety of forms.* A similar statement was also conveyed by ADB, particularly in the frame of introducing the IWRM approach in river management where ADB stated that *the application of IWRM varies according to each river basin's specific conditions and requirements, yet in all cases IWRM is focused on delivering a triple bottom line of balance of economics, social and environmental benefits resulting from an integrated approach that carefully considers each trade-off.*

While international organizations have focused on utilizing IWRM to integrate water-use sectors, national governments have been busy engaging with various international organizations and their discourses in formulating IWRM policies and programs in their respective nations.³ What is interesting is that these nations have embarked on IWRM to address water quality in the developed world, while alleviating poverty is the major concern in the developing world. Framing of statutory policies at the national level continues to be seen as a precondition for IWRM operation – expressing a linear approach in implementing IWRM. Unfortunately, in none of these countries have the policies been adequately supported by legislative measures to implement IWRM.

2.4. Critical View on IWRM

Nevertheless it does not mean that there are not any criticisms on IWRM. Saravan (2011) stated that based on the literature review, there were at least several problems relating to IWRM, namely: (1) *IWRM is a nebulous, catch-all concept, a "buzzword," lacking a roadmap to implementation;* (2)

the absence of functioning institutions cannot be solved by an external donor-driven effort; and (3) no metrics to evaluate success, or prioritize funding and intervention regions. Whereas according to Rahaman and Valis (2005), the biggest obstacle of IWRM is the practical implementation of the theoretically agreed-upon IWRM policies. This was fortified by Rahaman Valis and Stucki (2008) based on the cases in Mekong River and Senegal River, which stated that implementation challenges along the Senegal and Mekong River basins were presented to demonstrate the gap that exist between theoretical and practical applications of IWRM. Institutional settings, weak horizontal and vertical coordination, unrealistic plans, weak communication and consultation, transboundary watersheds, incomplete understanding of the philosophy of IWRM, and the lack of integration of the water sector into the broader development agenda are identified as the main constraints in the successful implementation of IWRM along the two basins.

Additionally, many people consider good policy as the precondition for IWRM operation. *Such policies consider resources in their entirety, and ensure systems of coordination between the many different institutions active in the water sector to integrate at the highest possible level. However, in practice, such 'good policies' are exploited by various stakeholders (ministries, departments, state governments, regional government, NGOs, user groups and village heads) claiming competencies and legitimacy for their existence as a specialized department or in pushing their strategies for survival* (Saravan, 2004)

Further, policies are not always the domain of the government; rather, diverse actors negotiate across levels through their perceived visions, goals and cultural-cognitive frameworks in shaping water policies (Jennings and Moore, 2000). Ninan (1998) and Saravanan (2002) demonstrate how various international agencies financing IWRM projects shape and reshape watershed landscapes to meet their own visions and goals. Schulze et al. (2004) revealed how the South African National Water Act-1998 embraces IWRM but emphasizes commercialization of agriculture. Unfortunately, it threatens the livelihood of black smallholder farmers.

Watershed or river basin may be a physical landscape, but stakeholders come up with different perspectives (depending on the knowledge, familiarity, awareness and comprehension in place) of IWRM. These diverse perspectives shape the statutory policies, programs, visions and values that stakeholders negotiate to manage water resources. In this 'ebb and flow' regime, stakeholders 'scramble for responsibilities and control,' thereby making development of the critical (water) resources more complex in the 'ensuing conflict and power struggles' (Lelo, et al, 2005; Mitsi and Nicol, 2003:12). Elites exploit this opportunity to dominate the discourse of watershed development in Andhra Pradesh (Mollinga, 2001; Chhotray, 2004; Reddy and Reddy, 2005). In this form of contestation, actors negotiate and integrate diverse policies to create a new space for themselves.

There are two crucial aspects that underpin the dominant understanding for operationalising IWRM: (i) the river basin as a management unit and (ii) involving stakeholders in the management of river basins. A river basin may be a physical landscape, but water, unlike land, does not have clear physical boundaries. In the Indo-Gangetic basin, although surface streams have distinct hydrological boundaries, ground water streams are rarely confined to these boundaries (Moench, et al., 2003). This is further complicated by: (i) variation and uncertainty over its availability (Mehta, 2002; Rodriguez-Iturbe, 2003); (ii) pollution (especially non-point sources), (iii) the transboundary nature of environmental problems (Singleton, 2002), (iv) the effect of globalization, and (v) the role of markets (Moench et al., 2003). Reconciling these diverse boundaries in a physical landscape rarely reflects the "wealth and complexity of local networks of resource use, decision-making and social interaction" (Cleaver, 1999: 603). A river basin may be a hydrological region, but it is the cultural, political and historical contexts that integrate institutions, within which water resources are managed (Ludden, 1978). Moss (2006), investigating the spatial organization of water management in EU, argues that a spatial 'fit' of river basin units along the political-administrative territories only exacerbates the problems of 'interplay' between water and other relevant institutions, thereby creating different territorial units for water management.

There is an overwhelming assumption among contemporary approaches that stakeholders can be easily identified and through their participation, possible agreeable solutions can be foreseen (Bellamy and Johnson, 2000; Innes, 1996; Leach et al, 1997; Margerum, 1996). In this process, IWRM implementers painstakingly attempt to identify diverse stakeholders and their role (see Wester *et al.*, 2005 for exhaustive attempts) to promote synergy among various stakeholders through a communicative rationality approach (Evans, 1996; Innes, 1996). Often, the national government takes responsibility for spearheading stakeholder's involvement through a number of institutional structures, such as water user groups or a watershed group, within a short time span. In Zimbabwe, after promulgation of the Water Act (1998), institutional structures were established across the country within six months (Manzungu, 2004). There has been a tenfold increase in watershed initiatives and similar groups during the 1990s in the Western United States (Kenney, 2000:1). Such a process of spearheading institutional structures may help the government achieve its target of democratic governance, but it fails to understand and manage the complex and dynamic behaviour of stakeholders who attempt to achieve IWRM.

Saravanan (1998; 2002) observes that stakeholders involved in managing water are numerous, and have overlapping roles that create competition (to establish supremacy) and sometimes conflicts. In the Western United States, stakeholders' identification, though it might appear to be clearly identifiable, is complicated by different interests within a group (Blomquist & Schlager, 2005). Drawing from the study of social learning for the integrated management of Europe's catchments, the SLIM research team (see the special issue of *Environmental Science and Policy*, Vol 10, Issue 6, 2007) concludes that though stakeholders are concerned with issues of quality, quantity and sustainability, 'they do not all hold the same social position with regard to measures proposed or taken to resolve the issues involved and they do not necessarily share the same view about what is desirable or what constitutes the purposes of resources.' Stakeholder analysis (SA) in the start-up phase provides only a static view of stakeholders, but their findings demonstrate "the dynamic interest and positions involved over time" (Steyaert & Jiggins, 2007). In the United States of America, integration has been complicated due to diverse and competing interests among stakeholders (Haro *et al.*, 2005; Nygren, 2004; Schulze *et al.*, 2004). Further, selective involvement of direct and easily identifiable stakeholders in various watershed programs only legitimizes the existing resource use pattern, depriving the poor and creating conflicts (Mosse, 1997; Saravanan, 1998). Stakeholders have a history and are linked to the socio-political context of their existence (Mosse, 1998:2), which creates disparities in perception, knowledge and beliefs, and presents barriers to effective communication between actors in the management of resources (Adams, *et al.*, 2002). The involvement of these stakeholders depends on their rights and entitlements. Such synergies do not evolve naturally; rather they require multi-scalar institutional arrangements that shape the incentives and constraints in resource management (Barrett *et al.*, 2005; Haughton and Counsell, 2004). Stakeholders play an important role in shaping and reshaping IWRM using prevailing rules, but their differential roles are context-specific.

The other criticism on IWRM is related to the participation process. Water consumers are usually widely distributed. The participation of each stakeholder is expected to lessen the transaction cost relating to the institutionalization and implementation of IWRM. According to Saleth and Dinar (2004), transaction cost related to time, effort and resource that is involved in obtaining information is needed in the negotiation to create and enforce changes. The actor's ability to reduce transaction cost is dependent on their ability (attribute, goods and services) to participate, and ability to create and enforce collective decision (Kolavalli dan Kerr, 2002).

Participation method and participation-based approach have emerged as important tools in simplifying complex and varying institutional management. Ross and Jakeman (1999) indicated obstructing political and cultural effects and power relations in promoting participation in countries along the Mekong River. Things that work at the local level might not be applicable in bigger river

basin areas. Participation, in the form of consultancy, has become the word to bring ‘warm light to its users and listeners,’ but the fact indicates that participation has many forms and serves different interests. This is a very political process, both within itself and in its association with other actors (Adams, 2001:337).

2.5. Water Resource Management in Indonesia

2.5.1. General Overview of Water Resource Condition in Indonesia

In general, Indonesia is one of the few countries who are destined to have abundant water resources. Various reports on Indonesian's current condition of water balance indicate that Indonesia still experiences water surplus, although several of its big islands have experienced water crisis (see Table 1). Potential water resources include rainwater, groundwater and surface water. The amount of water in Indonesia fluctuates by season and it is distributed differently among the regions. In general, most Indonesian regions have an annual rainfall of about 2,000 – 3,500 mm (60 percent). Some areas (3 percent) have an annual rainfall of over 5,000 mm while others have rainfall of less than 1,000 mm annually.

With an average annual rainfall of 2,700 mm, only an average of 278 mm (10 percent) infiltrates and percolates as ground water. The remaining (larger) portion flows as runoff or surface water. If this water – ground water and surface water – can be managed properly, it would readily be available with a total amount of about 2,100 mm annually.

Data on water resources, which include surface and groundwater, show that the potential of surface water is, among others, in Papua (1.401×10^9 m³/year), Kalimantan (557×10^9 m³/year), and Java (118×10^9 m³/year). Surface water is scattered in river bodies (5,886 units), in lakes, dams and wetlands (33 million hectares). Around 64 of 470 watersheds in Indonesia are in critical condition. Of those critical watersheds, 12 areas are in Sumatra, 26 are in Java, 10 are in Kalimantan, 10 are in Sulawesi, 4 are in Bali and Nusa Tenggara, 4 are in Maluku, and 2 are in Papua.

Table 1. Water Balance per Island in Indonesia

	Island	Water Availability (mill/m ³ /yr)	Water Needs (mill/m ³ /yr)			Water Surplus/Deficit (m ³ /yr)		
			1995	2000	2015	1995	2000	2015
1	Sumatra	11.077,7	19.164,8	25.297,5	49.583,2	91.912,9	85.780,2	61.494,5
2	Java	30.569,2	62.927,0	83.378,2	164.672,0	-32.357,8	-52.809,0	-134.102,8
3	Kalimantan	140.005,6	5.111,3	8.203,6	23.093,3	134.894,3	131.802,0	116.912,3
4	Sulawesi	34.787,6	15.257,0	25.555,5	77.305,3	19.530,6	9.232,1	-42.517,7
5	Bali	1.067,3	2.574,4	8.598,5	28.719,0	-1.507,1	-7.531,2	-27.651,7
6	NTB	3.508,6	1.628,6	1.832,2	2.519,3	1.880,0	1.676,4	989,3
7	NTT	4.251,2	1.736,2	2.908,1	8.797,1	2.515,0	1.343,1	-4.545,9
8	Maluku	15.457,7	235,7	305,2	575,4	15.222,0	15.152,5	14.882,3
9	Papua	350.569,7	128,3	283,4	1.310,6	350.461,4	350.306,3	349.279,1
10	Indonesia	691.314,6	108.763,3	156.362,2	356.575,2	582.551,3	534.952,4	334.739,4

Source: Presentation of DR. Sutopo Purwo Nugroho, 2010 (Based on the Ministry of Environment's data, 2005)

River water quality in Indonesia is mostly affected by domestic waste as well as industrial and agricultural waste. River water monitoring has been carried out in 30 provinces in 2004, with samples taken twice per year. The monitoring result indicates that parameters of DO, BOD, COD, fecal coli and total coli form are mostly above the water quality standards class I under Government Regulation 82/2001. The biological parameter, especially for fecal coli and total coli forms, indicate most river in populated areas such as Java is very critical, for example in Kulonprogo River (Central Java), Ciliwung (Jakarta), and Citarum (West Java). Whilst, more than 98% of all water is groundwater, only the rest of 2% is in rivers, lakes and reservoirs. One half of this 2% is in artificial reservoirs. Monitoring of 48 wells was conducted in Jakarta in 2004, and indicated that most of the wells contained coli forms and fecal bacteria. Iron (Fe) concentration in groundwater of Jakarta has been increasing, with some wells containing iron above the standard. The percentage of Jakarta's wells containing Mangan (Mn) above the standard level was around 27% in June 2005 which increased to 33% in October 2005.

Increasing population and development cause the increasing need for water resources. On the other hand, water resources availability is getting limited and critical at several locations. The decrease of water resources is due to some factors, namely, pollution, deforestation, heavy agriculture activities, the change in function of water catchment area, water user behavior, and natural phenomena (global climate change).

Indonesia's population growth rate is about 1.17% annually. Human activities and development for food production, housing, energy, industrial products, domestic purposes, have continued to put pressure on the existing water and water resources. The availability and performance of water resources infrastructure and facilities in Indonesia can be illustrated as follows.

Based on the MDGs 2010 report published by Bappenas, the number of households having adequate clean water access is as much as 47.71%, and households with sanitation access is 51.19%. Indonesia wishes to achieve the target of 68.87% for clean water and 62.41% for sanitation in 2015. The aforementioned facts basically show that water resource problems in Indonesia are not caused by the rarity of water supply, but more by the government's incapability in water resource management. Development policy that has been focused more in Java has caused 65% of Indonesian people who currently live in the island of Java to go through increasingly limited water support power. Not surprisingly, Java experiences water deficit.

According to Widianarko (2009), the numerous problems in water resource management were caused by ignorance of the complex association among water, ecosystem and human. This could happen because the dominant paradigm in water resource management was the management and economy approach. Economistic epistemology domination tends to deny the fact that water is a meaningful entity, not merely a commodity. Furthermore Widianarko, based on Clough-Riquelme (2003), stated that the debates over water resource, which look like to remain in debates for a long time, at least confirm three things, namely: (1) limitations of capitalism in managing water resource, (2) the state's essential role in water resource distribution, and (3) the need for compliance to sustainable development's principles in water resource management.

In the midst of the debates, the sustainability of water resource in the world is currently facing three tough challenges, i.e.: (1) the ever-increasing demand (rising demand), (2) the unequal distribution of water (unequal distribution) and (3) the increasing water pollution (increasing pollution) (Davis and Cornwell, 1998). The regime of water resource management in a region or a state will be a complete failure when the three challenges are not taken into consideration in the program agenda.

2.5.2. Water Management in Indonesia

The effort to improve the water resource sector in Indonesia has basically been carried out for a long time. For instance, in 1987, the government of Indonesia had reformed the policy in the irrigation sector. Since the early years of the New Order regime, irrigation policy had been focused on

the rehabilitation and construction of a new irrigation network. The policy was financially supported by the increasing price of fuel and the loan from international financial institutions, with the objective of improving agricultural production. From 1968-1993, US \$10 billion had been invested in the irrigation sector, 70% of which originated from external loan, to rehabilitate and construct an irrigation network that watered 5 million hectares of paddy field.⁴ The height of the policy was the achievement of food self-sufficiency in 1984.

The end of oil glory days forced the government to economize in various sectors including the agricultural sector, which also affected the irrigation construction. Based on such reason, the government in 1987 carried out a reformation of the irrigation management, which was also known as the Irrigation Operation and Maintenance Policy (IOMP). The policy was the outcome of a policy dialogue among the government of Indonesia, the World Bank, and the ADB, and was none other than the precondition to obtain a new loan fund in the irrigation sector. Irrigation sector policy reformation, funded by the World Bank through the First Irrigation Subsector Project (ISS I), ISSP II, and Java Irrigation and Water Resources Management Project (JIWMP), essentially introduced new policy in the irrigation sector that involved the transference of irrigation management, payment for irrigation service, and efficient management and maintenance.⁵ As part of the irrigation management reformation, farmers -- in this context, P3A -- were expected to actively participate in irrigation management. P3A was an irrigation management organization formed by the government (top-down approach) to take the place of traditional irrigation management organizations such as Ulu-Ulu, Raksa Bumi, Tudung Sipulung, and others.

In the implementation, P3A was actually unable to participate well. The inability of P3A was caused by several factors which, among others, were: (1) there was no incentive for farmers in joining P3A, unclear farmers' right to water, and no government institution which enabled farmers to represent their interests effectively as stakeholders in various issues related to the irrigation management; (2) the training provided for P3A had the tendency of being one-way and the government indoctrinated the real concept of P3A; (3) since it was established in top-down manner, the concept of P3A had the tendency of being disrespectful toward existing local organizations, hence, they had to be replaced by modern and permanent organizational structures; (4) the establishment of P3A was based more on the government's initiative, and the farmers were organized to participate in government activities.⁶

In the resource management aspect, the problems in the water resources sector have been sensed since the early 1980s as a result of the population growth increase, urbanization, and industrialization. The water resources sector in Indonesia was unable to address the increasing growth and various demands resulting from the population growth. In addition to the problems brought about by intersectoral competition, food security was also a crucial problem being dealt with in Indonesia, not to mention the flooding and environmental damage problems. The condition being experienced by the water resources sector, in addition to being caused by the things mentioned earlier, was also caused by the ineffective administration of the sector which in turn was due to the outdated policy paradigm and management institution, as well as the inability of the data system to overcome the emerging problems and challenges by effective and coordinated manner.⁷

To overcome those problems, fundamental changes in water resources management in Indonesia are needed. In 1993, sponsored by FAO and UNDP, a study on national water resources policy was carried out, which produced a draft of the National Water Resource Policy Action Plan/Rencana Aksi Kebijakan Sumberdaya Air Nasional (1994-2020).⁸ The result of the study carried out by FAO/UNDP was not given any consideration by related ministries because it was considered to have given more focus on the development of investment rather than on the needs to develop the management and regulation framework. Later in 1997, Bappenas initiated various discussions and seminars bearing the theme of Agenda for Water Resources Policy and Program Reform, with the objective of providing inputs for REPELITA VII. The discussions and seminars produced several visions for the management of water resources relating to the changes in management approach, from supply side to demand

side approach; then in the perspective on water where water was not merely seen as a public good but also as an economic good; and in water management implementation by applying incentive and disincentive policy. The economic crisis that hit Indonesia caused constraints in the reformation efforts of the water resources sector.

The economic crisis in 1997 had an impact on the collapse of the condition of the macroeconomy and payment balance deficit in Indonesia. The condition caused the inclusion of the Indonesian government in the restructuring program led by IMF and the implementation of the macroeconomy framework and policy expressed in the Memorandum of Economic and Financial Policies in the Letter of Intent (LoI) agreement which was signed for the first time on 31 October 1997 between the government of Indonesia and IMF. Several agenda of policy and institutional reformation were implemented based on: a) macroeconomy management; b) the financial and corporate sector restructuring; and c) the protection of the deprived; and d) economic institution reformation. The strategy and program to implement the above agenda was later finalized in 1998 together with the World Bank, ADB and several bilateral creditors. The World Bank also issued the "Policy Reform Support Loan" (PRSL) loan in June 1998, which was later followed by PRSL II, in which there was a plan to improve Indonesia's water resources management,⁹ as stated in the Matrix of Policy Actions in PRSL II.

Water resources management reformation plan emerged because by the end of 1997 a sectoral working team of the World Bank concluded that the Bank could no longer give further assistance to the Indonesian water resources and irrigation sector unless there was major restructuring/reformation in the sector. The need for reformation had also been identified by the World Bank during the inter-departmental sectoral dialogue spearheaded by BAPPENAS in 1997 during the preparation of Repelita VII.

With the occurrence of economy crisis, in April 1998, World Bank offered a program loan to Indonesia, i.e., WATSAL, to restructure the Indonesian water resources sector. The loan program became part of the entire loan to reform the Indonesian macroeconomy policy with "quick disburse" nature so as to cover the payment balance deficit as stated in the document of Country Assistance Strategy (CAS) Progress Report¹⁰ for Indonesia in June 1999.

The offer was accepted by the government of Indonesia, and Bappenas then established a special team consisting of a number of government staff and NGOs to formulate a policy matrix together with the World Bank team. The team, through the Ministerial Decree dated 2 November 1998, officially became the Tim Pengarah Nasional Program Pembangunan Bidang Sumber Daya Air (Task Force for Reform of Water Resources Sektor Policy), under Bappenas and the Ministry of Regional Infrastructure (Kimpraswil).

The team, better known as WATSAL Task Force/Kelompok Kerja WATSAL, together with related directorate generals and the government's coordination team/Water Resources Management Coordination Team,¹¹ signed the Letter of Sector Policy which consisted of the policy matrix formulated by the WATSAL working team. Additionally, the WATSAL working team also formulated the WATSAL Implementation Plan consisting of process stages and timeframe of each restructuring plan in the Policy matrix. The plan was submitted to the World Bank on 29 March 1999, serving as their guidelines in monitoring the progress of the restructuring implementation. The loan agreement of US \$300 million was finally signed on 28 May 1999, with a 15-year period of repayment and a three-year grace period. The disbursement of loans was carried out in three stages. The first stage was disbursed in May 1999, amounting to US \$50 million. The second stage, amounting to US \$100 million, was initially planned to be disbursed by the end of 1999 but was instead disbursed in December 2001 because of the political upheaval and shift in government occurring in Indonesia at that time. The third stage of the WATSAL agenda would be disbursed when the draft bill for Water Resources Regulation would have been passed.¹²

2.5.3. IWRM Approach in Water Resources Management in Indonesia

Water resources reformation in Indonesia, supported by World Bank through WATSAL, should actually be based on IWRM approach and the Dublin principles. This can be observed, for example, from the vision, mission and principles of water resources management in Indonesia, as the basis for IWRM implementation. The water resources management's vision based on the Water Resources Law¹³ was "(w)ater resources are managed in a comprehensive, integrated and environmentally friendly manner, with the intention of realizing the sustainable water resources' benefits for the people's maximum prosperity" (Article 3, Water Resources Law/UU SDA). In order to carry out the vision, five missions of water resources management have been identified, namely: 1) conservation of water resources; 2) water resources empowerment; 3) water access, ownership and politics of control; 4) empowerment and enhancement of community, business world, and government's roles; and 5) improvement of data and information's availability and transparency. Furthermore, in order to achieve the mission, water resources management is implemented based on the principles of harmony, public welfare, integrity, equality, autonomy, transparency and accountability.¹⁴

Furthermore, according to Anshori (2008), the efforts needed to be done to increase the performance of water resources management include cultivating the comprehension of IWRM concept among all stakeholders in order to be understood. The integrity of water resources management covers two big components, namely, natural and unnatural systems. Integration of the natural system's management components covers: 1) Upstream and downstream areas, 2) Water quantity and quality, 3) Rain water with surface water and ground water, and 4) Land usage with water empowerment. On the other hand, integration of non-natural system management component, at the least, covers: 1) Intersectoral integration in policy and program formation at the central and regional levels. Integration in this aspect was required to harmonize the economy development policy and social and environmental development policy. 2) Integration among all stakeholders in decision-planning and -making. The integration in this aspect was an important element in maintaining the balance and sustainability of water empowerment. Currently, each stakeholder still places different interest priorities; actually they often are conflicting with each other. Within this context, operational instruments need to be developed to mobilize synergy and conflict resolution. 3) Inter-administrative regions' integration both horizontally and vertically. In this aspect, not only it is important to have a clear division on management authority and responsibility, but also to develop inter-regional cooperation pattern based on mutual dependence and benefits.

Integrated management is a continuous process that should not stop. Each process must have an achievement target based on clear phases. Each designed stage process' accountability should be measurable. The success needs to be measurable through three major criteria, namely: 1) Economic efficiency. Right in front of us, the demand of water services keeps increasing, while in various regions, clean water and financial resource becomes a rarity or is limited. In such a situation, economic efficiency in water resources empowerment should become a consideration. 2) Equity. Water is one of the basic needs that is absolutely needed by everybody; hence, access to clean water needs to be achieved for everybody to meet the rudimentary of a healthy and productive life, 3) Environment function sustainability. Water resources empowerment should not only pursue the short-term economic interests but also has to consider the future generation's interests; hence, every empowerment effort has to be balanced with adequate conservation effort.

3. IWRM in Citarum River Management

3.1. Citarum River in Historical Perspective

Citarum River is one of the strategic rivers in the island of Java, disgorging in Mount Wayang, Bandung and emptying at Java Sea, in Ujung Karawang. According to A. Sobana Hardjasaputra (2007), etimologically, the name Citarum derives from two syllables, namely, ci and tarum. Ci or cai means water and Tarum, usually also called Nila, is a plant commonly used as purple dye. There is also another opinion stating that Citarum relates to the name of the oldest kingdom in West Java, Tarumanegara. Furthermore, A. Sobana Hardjasaputra stated that, according to a Wangsakerta manuscript, the center of the kingdom was situated by a river basin which was later called Citarum. Whoever gave the name Citarum to the river and when the name began to be used remain unknown. The center of the Tarumanagara Kingdom originated from a village built by Maharesi Jayasinghawarman and his followers. Jayasinghawarman came from Salankayana Kingdom in India. In 345 AD, the kingdom was conquered by Samudragupta, king of Maurya. Therefore Jayasinghawarman, along with a number of soldiers and his followers, fled to West Java (348 M).

Not only does Citarum has a long flow, it also has a long history. The name Citarum is estimated to have been used as the river's name since the growth of human civilization in West Java. Human civilization began to emerge during the Mesolithic age when prehistoric human began to adopt the culture of settling down in a place. Nevertheless, there has not been any writing/research specifically on the history of Citarum. Basically, this is due to the difficulties in seeking for historical data associated with the river, and the lack of historical awareness in our society.

Based on geological data, before the region of West Java was inhabited by prehistoric human, the river which was later called Citarum had existed. During the ancient age – Holocene age (\pm 6000 BC) in particular – the flow of Citarum in the area of Cimeta (Padalarang) was blocked by the volcanic lava of Mount Sunda. Gradually, the river water flooded the vast area, from the area of Padalarang until the area of Cicalengka (\pm 30 km) and from Lembang (the slope of Mount Tangkubanparahu) to Soreang (\pm 50 km). This means the flooded area has the width of 150 square kilometers. Such a vast area became the "Ancient Bandung Gigantic Lake" for a lengthy period of time.

3.2. Basic Data of Citarum River

Citarum River is approximately 270 km long with its variation of river discharge complying with existing rainfall distribution and marked with the factual difference between rainfall in the rainy season and dry season. Rainfall in the basin of Citarum River varies between 2.500 mm annually in the downstream area to 3.000 mm annually in the upstream area. In normal condition, most of the rainfall (70-75%) occurs in the rainy season and the rest in the dry season. Relative humidity is 80% and the average daily temperature is 25°C in the lowlands and 18°C in the mountain area.

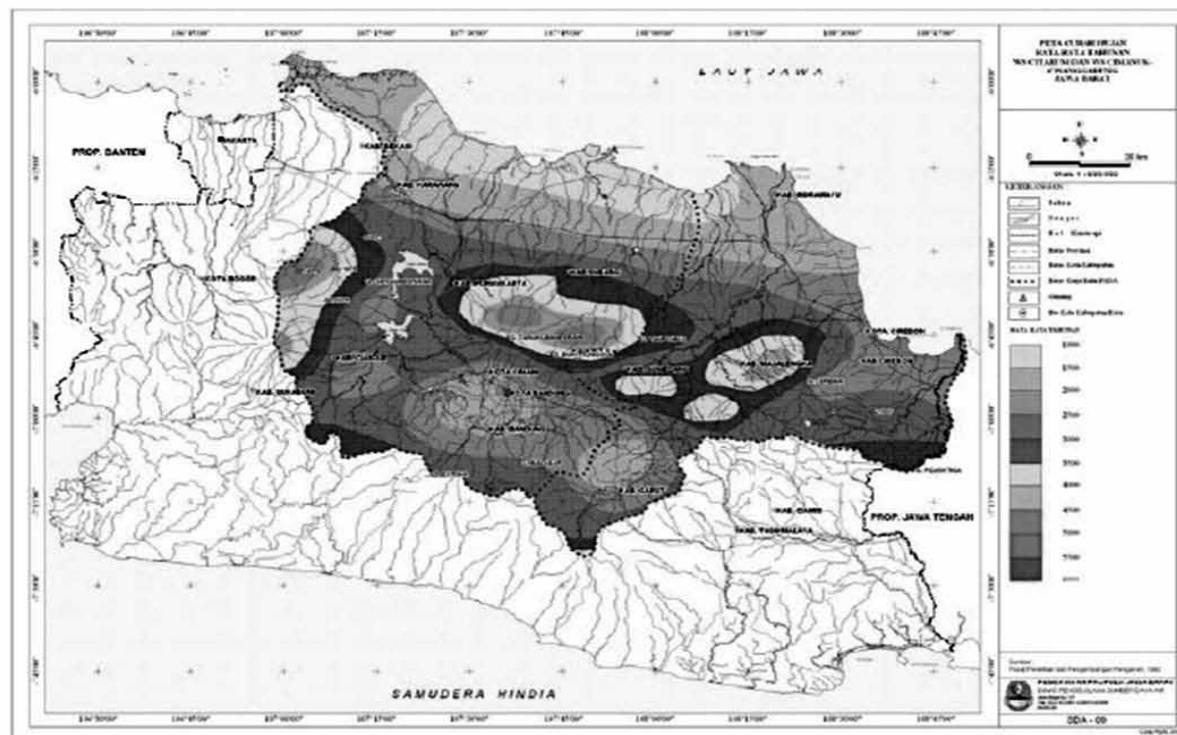
Total water potential in the area of Citarum River is as much as 13 billion m³ annually. The exploited water potential is as much as 7.5 billion m³ per annually (57.9%), and as much as 5.45 billion m³ annually (42.1%) has not been exploited.

Table: 2 Average Flow of Citarum River

Year	Average Flow of Citarum River (million m ³)												
	jan	Feb	mar	apr	mei	juni	juli	ags	sept	okt	nov	des	Total
2001	690.01	719.01	649.99	1039.00	541.01	464.98	281.02	208.02	203.06	632.18	1301.96	394.39	7124.63
2002	1064.18	751.04	976.22	882.96	306.06	186.03	251.18	98.48	75.04	80.35	203.91	664.73	5540.18
2003	350.09	710.28	730.64	399.17	386.20	98.24	49.71	55.84	149.95	420.88	333.67	609.79	4294.46
2004	612.93	610.79	774.81	641.99	683.98	153.52	126.50	43.58	128.77	104.83	292.20	569.16	4743.06
2005	639.12	973.20	914.62	749.35	369.46	433.62	237.33	145.95	183.51	226.43	313.40	563.11	5749.10
2006	713.61	752.13	360.78	590.06	350.25	134.46	63.16	34.40	25.30	42.01	78.48	641.18	3785.82
2007	269.98	759.56	529.38	921.47	430.45	319.52	126.56	53.92	47.76	219.58	617.02	814.22	5109.42
Average	619.99	753.72	705.21	746.29	438.20	255.77	162.21	91.46	116.20	246.61	448.66	608.08	5192.38

Source: Perum Jasa Tirta II 2008

River flows from the upstream of Citarum River into Saguling Dam (built in 1996), then it flows back to Citarum River and goes into Cirata Dam (built in 1988). Exiting Cirata Dam, the water discharge of Citarum River increased due to the existence of the tributaries entering and accommodated by Jatiluhur Dam which was built in 1968. From Jatiluhur Dam, the water of Citarum River flows through three canals, namely, East, North and West Canals. When the water in Jatiluhur Dam surpasses the capacity of Tarum Canal, the water will flow to Walahar Dam and empty in the Java Sea.

Figure 1

3.3. Citarum River and the Dynamics of Water Allocation

The construction of Jatiluhur Dam was initially targeted to improve the welfare of the people, mainly by providing an irrigation network system. The area serviced by the Jatiluhur irrigation system is known by the name of Jatiluhur Irrigation Region, divided into three service areas, namely, East Tarum, West Tarum, and North Tarum. It irrigated an agricultural area of approximately 264.000 ha width in West Java's North Coast region (covering the Districts of Karawang, Bekasi, Purwakarta, Subang and Indramayu), which is the rice production center area. Rice production in these areas has a quite high percentage to total rice production of West Java Province and in the national level. During the period of 1990 – 1996, the contribution from rice fields in the Jatiluhur Irrigation Region to the total production of West Java Province's rice ranged between 40–45%, whereas contribution to the national rice production total ranged between 7–9.4% (Pamungkas, 2005).

Jatiluhur Dam, with its normal capacity of approximately 3 billion m³, also functions as provider for the crude water needs of the Regional Drinking Water Company (PDAM) in several districts in West Java and DKI Jakarta, as well as for the industrial zone in the area of Jakarta and nearby areas. According to Ali (2005), the clean water services with piping system in the area of DKI Jakarta managed by PDAM DKI Jaya are only capable of servicing about 44% of the total population of Jakarta, and still rely on the water supply from Jatiluhur Dam through West Tarum Canal which is about 70 km away from Jakarta.

The flow of Citarum River, which is the biggest river in West Java, is also utilized for hydropower generator (PLTA) that contributes enough to national electricity supply, particularly for the Java-Bali interconnection network. PLTA of the three Citarum's cascade dams produces 5 million kWh/annum of electricity, equalling 16 million ton of power produced by fuel oil annually (Pamungkas, 2005).

The following Table3 illustrates the projection of crude water demand from the Jatiluhur Irrigation Region from 2003 to 2025. Domestic crude water demand per day keeps increasing. The projection for 2025 domestic crude water demand in Karawang reaches 312 m³/day or 3.61 m³/second, followed by the city of Bekasi with 252 m³/day or 2.92 m³/second.

Table 3. Projection of Crude Water Demand in Jatiluhur Irrigation Region

No	City	Projection of Crude Water Demand (thousand m ³ /day)				
		2003	2010	2015	2020	2025
1	Bekasi City	84	139	177	211	252
2	Bekasi	114	148	175	201	234
3	Karawang	224	253	272	289	312
4	Purwakarta	11	16	20	24	27
5	Subang	41	49	55	61	68
6	Indramayu	58	76	91	106	125
Total		532	681	790	892	1018

Source: Nippon Koei, 2006

Jatiluhur Irrigation Region consists of three major canal areas, namely, East Tarum, North Tarum, and West Tarum. East Tarum area covers the District of Subang and the west side of Indramayu District; North Tarum area covers Karawang District; and West Tarum area covers DKI Jakarta, Bekasi District and City. The West Tarum area is different from the other areas since the area's development is directed to become an industrial center and a residential area.

Land use in Jatiluhur Irrigation Region from 2001 until 2007 was dominated by technical irrigated rice fields. In 2007, the highest proportion was in Karawang District with 87.28 thousand hectares

(39%), followed by Subang and Indramayu with 85.86 thousand hectares (37%), and the District/Municipality of Bekasi with 53.65 thousand hectares (24%). The decreasing width of rice field from year to year is due to the fast industrial growth and the increasing population, particularly in the District of Bekasi. Even though the width of rice field areas keeps decreasing, Table 3 indicates that this does not necessarily mean that the demand for water is also decreasing because the residential and industrial areas continue to grow.

Table 4. Technical Irrigated Rice fields in Jatiluhur Irrigation Region, 2001-2007

No	Area	Technical Irrigated Rice fields in Jatiluhur Irrigation Region (Thousand Ha)						
		2001	2002	2003	2004	2005	2006	2007
1	West Tarum	58.196	58.196	58.196	54.935	54.392	53.652	53.652
	a. Cikarang	30.671	30.671	30.671	30.781	30.626	30.071	30.071
	b. Lemang Abang	27.525	27.525	27.525	24.154	23.766	23.581	23.581
2	North Tarum	87.426	87.426	87.426	87.396	87.396	87.276	87.276
	a. Rengas Dengklok	45.996	45.996	45.996	45.996	45.996	45.846	45.846
	b. Talagasari	41.430	41.430	41.430	41.430	41.430	41.430	41.430
3	East Tarum	97.297	85.561	83.865	83.863	83.855	83.855	83.855
	a. Jatisari	34.957	21.757	21.742	21.740	21.740	21.740	21.740
	b. Binong	25.962	25.749	25.728	25.728	25.727	25.727	25.727
	c. Patrol	36.378	38.055	36.395	36.395	36.388	36.388	36.388
	Total	242.919	231.183	229.487	226.194	225.643	224.783	224.783

Compared to the other parts of Citarum River, West Tarum Canal indicates the existence of greater conflicts. These include not just water allocation problems, but also the involvement of various parties, locally and nationally, as well as multilateral institutions such as ADB and World Bank, and also two private operator partners of Jakarta's Drinking Water Company/ Perusahaan Air Minum Jakarta (PAM Jaya): Palyja whose 51% of shares belong to world's water mogul Suez Lyonnaise; and Thames Pam Jaya TPJ which currently belongs to Indonesian domestic investor, Aquatico, after being transferred several times from British's Thames Water to German's RWE.

Along the West Tarum Canal, there are various problems when water is being fought over by various interests, particularly during the dry season when water supply is decreasing. In addition to being prone to conflict of interests, the 70 km-long canal also has a problem with its damaged physical condition which causes water supply with various allocations to be disrupted.

3.4. The Condition of Upstream Citarum

Similar conditions also occur in the upstream of Citarum River. Several problems are dealt with in the upstream areas which include, among others, the decreasing function of the protected area (forest and non-forest), the growth of residential area that is not well-planned, and agricultural cultivation that is not in accordance with conservation norms which eventually causes the increasing number of critical land and erosion that causes sedimentation on the water resources infrastructures.

Additionally, river pollution also becomes a problem in the upstream area. The behavior of the community, both industrial and residential, regards the river as a waste water disposal area due to improperly managed waste management; hence, Citarum River is dominated by floodwaters, garbage, and industrial and domestic waste. Such situation is worsened by the weakness of law enforcement in dealing with pollution cases. Another main problem in the upstream of Citarum River involves

the degradation of water resources function such as the width of critical land reaching 26,022.47 ha, which causes run off of surface flow by as much as 3,632.50 million m³ per annum and sedimentation by as much as 7,898.50 ton/ha.

Another problem is the level of out-of-control ground water extraction, where most of the ground water extractions are not registered. It is estimated that ground water extraction reaches three times the amount reported to the government, and 90% of the households and 98% of the industries around Bandung basin rely on ground water for their daily water needs. Excessive and out-of-control ground water extraction can lead to land subsidence and structural damage on building constructions, as well as a potential increase in flood-prone areas.

Ecological change condition in the area of upstream Citarum has begun since the 19th century when the Dutch colonial government did logging and cleared the forest area to be transformed into plantations. The activity was followed by the construction of residential buildings and intensive agricultural activities. Specifically, since 1960s, the ecological changes have transformed the catchment area/Daerah Aliran Sungai (DAS) into a natural and artificial natural environment mosaic with different vegetation composition and structure (Gunawan dkk, 2005). Human activities of natural forest clearing in the upstream Citarum resulted in five types of main land use: tea and quinine plantations, residential or gardens, high land agricultural fields, rice fields, and bamboo plantation or trees (talun). Lately, the bamboo plantations have drastically decreased and are actually disappearing from several villages, particularly at the very top of upstream Citarum. Since the late 70s, there has been a tendency for people to convert bamboos plantation, rice fields, and community driven plantations into highland agricultural fields (dry land agriculture), and some into residential areas.

Based on the discussions with farmers at the upstream area, the impact of mismanagement of Citarum's catchment area caused various water dispute cases between several parties such as the industry, farmers and other parties. At the catchment area of upstream Citarum, the water dispute affected the farmers' reduced access to surface water. Bad water management at Citarum's catchment area caused the farmers' access to water, both qualitative and quantitative, to become even more limited. On the other hand, various policies and programs, including ICWRMIP, and the effort to restore and save the environment in Citarum's catchment area have not made a better impact for the farmers and the people in the area.

3.5. ADB and Citarum River

Based on past analysis and studies, there are several problems faced by Citarum River, i.e., the weak river management, bad infrastructure conditions, competition in water usage, and industrial and urban area growth which eventually worsened the environmental condition in both upstream and downstream.

In reference to the situation above, Asian Development Bank (ADB) made an offer to the government of Indonesia in the form of a project loan to restore the condition of the Citarum River after several previous aids had been granted by ADB in the form of Technical Assistance (TA) related to Citarum River (see Table 5). The loan amounting to US \$500 milion was granted by ADB for the Integrated Citarum Water Resources Management Investment Program (ICWRMIP) project.

Table 5 Tabulated Summary of Financing for ICWRMIP¹⁵

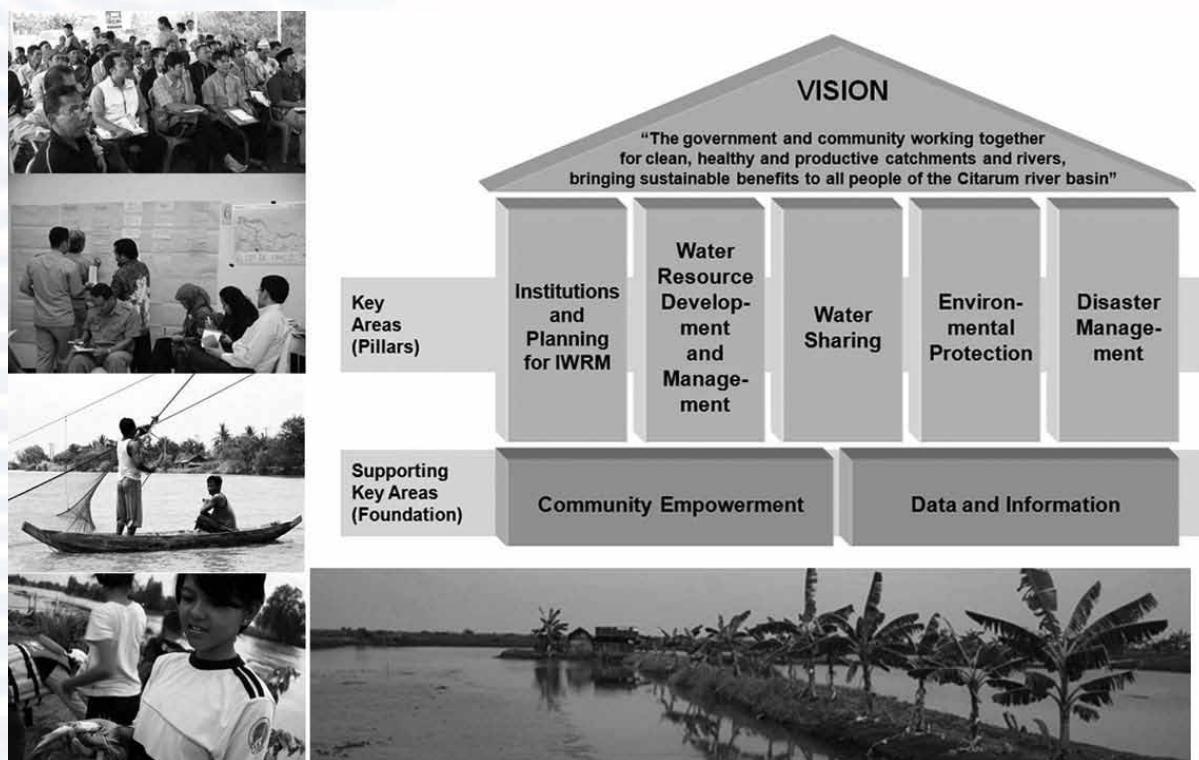
ADB Investments for ICWRMIP	Amount	No.	Type/Modality of Assistance	Status
1. TA-4381 INO: Integrated Citarum Water Resources Management	US\$1.0 million	<u>Technical Assistance: 37049-01</u>	TA Special Fund	Approved; 26 Aug 2004
2. TA-4381 INO: Integrated Citarum Water Resources Management (Supplementary)	US\$275,000	<u>Technical Assistance: 37049-02</u>	TA Special Fund	Approved; 22 Jun 2006
3. TA-4381 INO: Integrated Citarum Water Resources Management (Supplementary)	US\$460,000	<u>Technical Assistance: 37049-03</u>	Technical Assistance Special Fund	Approved; 17 Sep 2007
	US\$250,000		ATF Spanish TA Grant	
4. TA-4381 INO: Integrated Citarum Water Resources Management Project (Supplementary)	US\$200,000	<u>Technical Assistance: 37049-04</u>	Global Environment Facility	Approved; 12 Mar 2008
5. TA (for approval in 2011): Support to Integrated Citarum Water Resources Management Investment Program - Project 2	US\$1.0 million	<u>Technical Assistance: 37049-05</u>	Technical Assistance Special Fund	Proposed; approval TBD
6. TA (for approval in 2009): Integrated Citarum Water Resources Management Investment Program PFR2	US\$1.0 million	<u>Technical Assistance: 37049-06</u>	Technical Assistance Special Fund	Proposed; approval TBD
7. TA (for approval in 2008): Institutional Strengthening for Integrated Water Resources Management in the 6 Ci's River Basin Territory	US\$1.0 million	<u>Technical Assistance: 37049-07</u>	Technical Assistance Special Fund	Proposed; to be approved on 04 Dec 2008
	US\$5.0 million		Netherlands Fund (with LoA)	
	US\$2.0 million		Cooperation Fund for the Water Sector	
8. MFF-Facility Concept (for approval in 2008): <u>Multitranche Financing Facility - Integrated Citarum Water Resources Management Investment Program</u>	US\$470.0 million (OCR)	<u>Multi-Tranche Financing Facility: 37049-01</u>	MFF using: Ordinary Capital Resources	Proposed; to be approved on 04 Dec. 2008
	US\$30.0 million (ADF)		Asian Development Fund	
9. Loan (for approval in 2008): Integrated Citarum Water Resources Management Investment Program - Project 1	US\$20.0 million (OCR)	<u>MFF - Subproject: 37049-02 [Proposed]</u>	MFF using: Ordinary Capital Resources	Proposed; to be approved on 04 Dec. 2008
	US\$30.0 million (ADF)		Asian Development Fund	
10. Loan (for approval in 2011): Integrated Citarum Water Resources Management Investment Program - Project 2	US\$100.0 million	<u>MFF - Subproject: 37049-03 [Proposed]</u>	MFF using: Ordinary Capital Resources	Proposed; To be approved in 2011

Based on the project document 'Executive Summary for Integrated Citarum Water Resources Management Investment Program,' it is mentioned that the expected impact of the investment program is that the poverty, health and level of those living along the area of Citarum River will be significantly improved by 2023. Such condition can be achieved through the reduction in measurable poverty level in the area; the maintenance of GDP growth in the river area at the 2008 level at least, without creating worse environmental conditions; and the occurrence of significant improvement of water quality in the river area.

Furthermore the document also stated that the investment program proposed has a very wide coverage, and is expected to produce various benefits for the communities along the river, i.e., by: (i) upgrading the condition of the catchment area at the upstream river; (ii) meeting the requirements in the quantity and quality of water in the river flows and dams; (iii) maintaining the availability of drinking water and restoring sanitation in the city centers (including the urbanized areas of Jakarta which receive about 80% water from the area of Citarum River through West Tarum Canal) and the villages; (iv) decreasing damage and loss due to flooding, as well as other damages caused by water's destructive power; (v) upgrading agricultural products through more effective distribution of irrigation water and more efficient irrigation management; and (vi) using and allocating the limited water resources in a more economical and equitable manner. Another important thing is the realization of an appropriate and effective institution management for integrated water resources management in the river area. This may be achieved by: (i) encouraging and facilitating effective cooperation among government institutions at national, provincial, and district level in implementing planned water resources and land management activities with funding assistance from Investment Program; (ii) preparing good information database which can be accessed widely and easily by the decision-makers, water managers, and technical experts to enable them to implement their respective responsibilities in the sector of water resource management, and (iii) building good relationship between the government and the people who work together side by side in achieving mutual perspective for the improvement, development and management of intergrated water resources.

To achieve the objectives above, a roadmap of Citarum River management is created (Figure 2). The roadmap is based on the urgency of people's empowerment, including people's participation, and of data and information, which are the general elements essential in integrated water management.

Figure 2. Citarum Roadmap



Source : <http://citarum.org/upload/upload/ENG-roadmap07.jpg>

4. IWRM at Citarum River: Between Concept and Reality

4.1. People's Participation

As expressed in the ICWRMIP roadmap, people's participation becomes one of the key areas in the implementation of the ICWRMIP program. Thus, if the process of people's participation does not occur or does not work as it should be, it would have a negative effect on program achievement. Within this framework, people's empowerment includes: (1) education to raise their awareness, and capacity improvement of the society, groups, and individuals on water resources management issues; (2) activities that are intended to provide information to those needing it in the management of water resources and related activities; (3) implementation of activities that would facilitate people's participation in water planning and management; and (4) development of independent programs based on the needs of the community and specific project on the restoration of local drinking water provision, environment, and water quality.

Starting with Project 1,¹⁶ the society-based approach will be implemented in case of environmental damage and for urban and suburban public health, as well as for local community empowerment through awareness enhancement and capacity enhancement in combining local efforts on the implementation of drinking water and sanitation facilities.

In reality, the plans did not work well on the field. At least there were problems that caused the conditions to occur, i.e., the ICWRMIP project's initial lack in socialization and consultancy, and project implementation delays. From the beginning, people living in the banks of Kali Malang River area (Bekasi and Karawang) have never been involved in the project plan; instead they were actually being evicted without any clear mechanism of relocation. The people then had to live in temporary locations with housing conditions that were below appropriate, such as the lack of access to clean water and sanitation as well as electricity.

Moreover, the focus of Project 1, which is the downstream area, has lessened the attention on the problems of the upstream people, most of whom were farmers who depended on the Citarum River. The bad condition of the Citarum River was worsened by the limited regulation of the water problem in the upstream area which directly affected the farmers in terms of, for instance, decreasing productivity of the land. Such condition was worsened even more in the dry season when the farmers had to spend extra to provide water pump to get water.

According to the farmers in the Irrigation Region of Wangisagara,¹⁷ farmers in the past managed the surface water of Citarum by putting forward the principles of mutual cooperation and self-reliance, then together they managed the existing irrigation system by using ilir giring pattern where there was a fair turn of water usage for the farmers, supported by udunan or contribution system during harvest in the village and a cai partner established in each village.

In the context of water quality, prior to the existence of factories in the area of Majalaya, the surface water was better and cleaner in the past because it had not been polluted by the existing industrial waste. In fact, the conservation of the upstream area had been well-maintained. Yet ever since the industry flourished, the surface water of Citarum had been heavily polluted by waste accumulating at the upstream area, particularly the water that had already flowed through the existing irrigation system. In fact, waste water spread to rice fields, thus, affecting water productivity. Additionally, the diversity of river fauna is seriously threatened, with around sixteen aquatic animal in Citarum that can no longer be found.

Based on the experience of the farmers in the Union of Water Users Farmers Association/Gabungan Perkumpulan Petani Pemakai Air (GP3A), farmers' involvement in water and agricultural management in Citarum could not be identified as the major factor in Citarum irrigation policymaking. The farmers were hardly ever involved in the decision-making, and in many cases the farmers became the victims of the implemented program or project. The System of Rice Intensification SRI model

planting program was an effort to marginalize and alienate farmers from their right to access water, and had not provided concrete benefits to the sustainability of agriculture. Additionally, the policy also had the tendency of separating partnership among the farmers.

The situation experienced particularly by farmers at the Citarum's upstream area indicated at the very least that ICWRMIP was not or had not been able to answer the water problems at the level of farmers due to the project's limited coverage or incapability to encourage the real participation of farmers.

Another problem related to the participation in ICWRMIP was the plan to establish Water Resources Council/Dewan Sumber Daya Air (DSDA) at the local level. Based on the experience of DSDA establishment at the national level, the process was carried out in private and far from involving the community. The community representativeness was merely through specific NGOs or CBOs which do not necessarily represent the real voice of the farmers or other marginalized groups. Thus, the real participation of the community at the grassroots level could not possibly be represented by the establishment of DSDA.

4.2. Water Allocation

ICWRMIP also intended to administer the usage and allocation of water covering the rights to use water, protection and conservation of water, as well as fair allocation of water for the utilization in various sectors such as agricultural irrigation; domestics and industries; or geographical water division covering upstream area, downstream area, or cross boundaries. The objectives to be achieved in this component are: 1) Develop fair water usage-setting between users at the upstream and downstream of Citarum River areas, and water resources' cross-boundary users (water provision to Jakarta); 2) Clearly and strictly establish the water usage rights of all water users; and 3) End various conflicts in the usage of Citarum River area's water resources immediately and satisfactorily among all parties.

It can be affirmed that the objectives could not be realized considering that the ICWRMIP program was only partially implemented and also that a marginalization process had already been instigated against water allocation for farmers through the policies on water allocation management in Citarum River.

The irrigation water reallocation process for other interests would make a negative impact on the suburban economy, e.g., reducing irrigation water would reduce the width of planting areas and would cause loss of livelihood, reduce food production, and other social disturbances (Rosegrant and Ringler, 1998). Actually, allocation changes as mentioned above are forbidden according to Law no. 7/2004, article 29, clause (3) which states that the priorities on irrigation water provision are higher than water provision for industrial interest. Nevertheless, with the approach that water allocation is attached to agricultural land, someone who rents or purchases the agricultural land can extract irrigation water that is an attached right to the land (Budi Santosa Wignyosukarto, 2006).

Within the context of water allocation management at Citarum River, the marginalization of water needs for farmers' irrigation interests occurred through the function and role-changing process of the managing institution, in this case, the Perusahaan Umum (Perum) Jasa Tirta II. Initially, Perum Jasa Tirta II had been established to fulfill the needs of the people who were the major priority in the water allocation of Jatiluhur Dam, where equal and prosperous people was the core of establishment of the state-owned company, as the manager of Jatiluhur Dam. But currently, the management provides services for public benefit and at the same time gained profits based on the principles of company management. The changes automatically affected the water allocation policy at Citarum River, particularly in the Jatiluhur area.

There are at least three sectors with the competency to obtain water in the Jatiluhur region, namely, irrigation, clean water, and industry. The irrigation sector was the one that contributes the least to Perum Jasa Tirta II's revenue.¹⁸

On the other hand, environmental damage also contributes to the reduction in water supply that is flowing in the Citarum River. Water competition became inevitable when the available water was limited. Another contributing factor is the damaged irrigation network. It is predicted that the irrigation infrastructures' damage in the area of Purwakarta reaches 60%, while water allocation for irrigation remains first priority compared to the industrial or domestic sector.¹⁹ Irrigation infrastructure damages are caused by long period of usage and lack of maintenance and restoration.

According to Irianto (2006), the agriculture sector's high need for water for irrigation with an irrigation network level of efficiency, which currently remains below 50%, led to accusations that the sector is water-consuming and thus needed to be privatized. Moreover, Irianto said that the accusation was very inaccurate and harmful because the agriculture sector actually needs water only during the dry season, whereas it completely depends on rainfall during the monsoon season. The non-existence of significant economic contribution and the greater need for water compared to other sectors, as well as the irrigation network damage, increasingly reduced water allocation for irrigation needs whereas water allocation for non-irrigation needs keeps rising.

Such condition causes the emergence of water conflicts, both among farmers or between areas. Farmers with rice fields far from irrigation canals often experience water deficit and accuse farmers working near water canals of taking their water quota. Such conflicts usually occur during the dry season. Apart from conflicts among farmers, conflict between urban and suburban areas also occur where suburban people perceive their water needs often being set aside by the urban population's and the industries' own water needs.

The difficult situation faced by farmers in the downstream area of Citarum River forces them to 'save' water and to often use wastewater to irrigate their rice fields. Water-saving is carried out by the farmers by implementing, for example, a planting season rotation which unfortunately have difficulties being implemented due to various technical obstacles, particularly the lack of capital. Another method that the government tried to suggest was the utilization of the System of Rice Intensification (SRI) method. Neither did this method solve water problems at the farmer level.

The planting season rotation did not work because most of the rice fields were managed by sharecroppers. Sharecroppers were often late in planting the seed since they had to wait for the capital, seed, fertilizer, and others from the rice field owners who usually were people from the city or the rich residents in the area.²⁰

Another emerging impact of the water allocation problem is the increasing agricultural land sale by the farmers. The amount of capital needed for farming was not balanced out by satisfactory income from the harvest, which, among others, was due to the absence of smooth-flowing water.²¹ On the other hand, the increasing need for land for housing and industry needs also triggered the strong land sale.

Bad policy and regulation, severe environmental damage, and poor irrigation network infrastructure made the farmers increasingly marginalized in water allocation. Such condition was worsened by the non-existence of local institutions at the level of farmers that can accommodate the farmers' interests. Uniformity of water user groups in the form of P3A and the effort to strengthen their role beyond that of a social institution had actually weakened social values. Cases of water encroachment by one farmer on another farmer, such as the one that occurred in Karawang, comprise some of the evidences.

5. Conclusion and Recommendations

5.1. Conclusion

Water resources have become one of the major development problems at present. The limitation in water resources, both in quality and quantity, which is caused mainly by the weak capacity of the government in water resource management, is a major problem being faced by many developing countries, including Indonesia.

Integrated Water Resources Management (IWRM) is considered as the best solution to the current water resource problem, as it coordinates the development and management of water and other related resources in order to optimize the economic results and social welfare benefits equally without sacrificing the sustainability of the vital ecosystems. Nevertheless, IWRM has some weaknesses. For instance, IWRM is good as a conceptual discourse but is difficult to implement. The case of the Mekong River proved the existence of a gap between theory and implementation of IWRM, with institutional administration, poor coordination both vertically and horizontally, poor consultancy and communication, as well as an inability to integrate water sector issues into the other development agenda, proving to be hindrances in the achievement of success in the area of IWRM.

Water resources management in Indonesia still tends to be fragmented with so many institutions responsible for water resources management. Coordination among institutions is still very poor so that water resources management becomes problematic. Within the context of Citarum River, the issue of coordination also became one of the problems but is about to be overcome through the ICWRMIP project. However, as Saravan (2011) stated, *the absence of functioning institutions cannot be solved by an external donor-driven effort*. Therefore, it has to be solved by the government of Indonesia even without any external loan project.

The strategic function of Citarum River as the source of electricity, crude water, and irrigation made the management of the river a separate problem. River management is handed to Citarum River Basin Organization/Balai Besar Wilayah Sungai (BBWS) Sungai Citarum which is a unit under the Ministry of Public Works, whereas the Citarum River water usage is handed to Perusahaan Umum (Perum) Jasa Tirta II which is a business entity under the Ministry of Public Works. Perum Jasa Tirta II organizes water allocation at Citarum River, particularly at Jatiluhur Reservoir, for the needs in electricity generation, irrigation and crude water.

Water allocation problems leading to water conflict occur due to the usage of water for irrigation needs, which has been taking the biggest portion compared to crude water and electricity generation. On the other hand, water for irrigation has a lower economic value compared to water allocation for crude water needs and electricity generation, which in turn allows water allocation for agriculture to continue decreasing while water allocation for non-irrigation needs keeps increasing. A functional shift from agricultural lands to residential or industrial areas could be the next impact of the decreasing water allocation for irrigation.

The ICWRMIP program, which is being implemented by the government of Indonesia, tries to overcome all of the problems being experienced in the river basin of Citarum, through the involvement of all concerned parties. Such participation is accommodated through the formation of the Water Resource Council. Without a clear and democratic mechanism, the formation of a council will undoubtedly be an exercise in vain, particularly in accommodating the farmers' interests at the grassroots level. The experience of more than 3 years since the signing of ICWRMIP project indicated that the project is very weak both from the aspect of project design and project accountability. The eviction case of people living along the banks of Kali Malang River is an evidence of the weakness in coordination, design, and accountability in implementing the ICWRMIP project. Given this weak approach, undoubtedly all other efforts to be implemented within the ICWRMIP project that could affect the life of the community, will also become problematic.

5.2. Recommendations

- Improvement of water resources management, both at the national level and at the river area, has to be the major priority of the government of Indonesia. The restoration need not have to wait for an external loan project such as ICWRMIP before it can be conducted.
- In addition to management improvement, ensuring that the water sector is well-coordinated with other sectors such as land and other resources also needs to be the priority for improvement.
- The ICWRMIP is a project that was implemented to overcome not just problems in clean water and in irrigation, but also those related to conservation, flooding prevention, food, and others. Thus, the approach that sees water as an economic good should not be the main consideration in the restoration of Citarum River. Additionally, institutions such as Perum Jasa Tirta II whose behavior is based on economic motives, need to have their existence reviewed. The role of the government in ensuring and making water beneficial for the people's social welfare should be the main consideration instead.
- Within the context of the Citarum River restoration, projects such as ICWRMIP should have a clear and accountable design. This is because projects such as ICWRMIP are not merely physical projects but also projects that affect the lives of people residing along the bank of Citarum River. A clear and accountable design will help free the affected people from having to experience losses brought about by the project.
- Ensure the availability of an actual mechanism for people to participate by forming a people's water parliament in the area of Citarum River. This needs to be done because the participation mechanism via the water resource council is not adequate enough to ensure actual participation of the people.

Endnotes

- 1 *The Dublin Principles consist of 4 principles, namely: 1) Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment. 2) Water development and management should be based on a participatory approach, involving users, planners and policymakers at all levels. 3) Women play a central part in the provision, management and safeguarding of water. 4) Water has an economic value in all its competing uses and should be recognized as an economic good.*
- 2 See United Nations Water Virtual Learning Centre : Histoy and Development of IWRM
- 3
- 4 See Bryan Bruns, "From Voice to Empowerment: Rerouting Irrigation Reform in Indonesia" <http://www.bryanbruns.com/Empower7.pdf>
- 5 *Irrigation service fee was the policy of water usage cost that was charged to the farmers for the operation and maintenance of the irrigation network. The amount of the fee was based on the amount of services received. Payment was made through local government for the operation and maintenance done by the irrigation management institution. Irrigation management was delegated from the government to the WUAs with an area of less than 500 ha. Whereas efficient management and maintenance was the effort to guarantee effective water distribution. The policy also brought about changes with the existence of uniformity on Perkumpulan Petani Pemakai Air (P3A).*
- 6 See Bryan Bruns, "From Voice to Empowerment: Rerouting Irrigation Reform in Indonesia" <http://www.bryanbruns.com/Empower7.pdf>
- 7 See World Bank. "Report and Recommendation of the President of the International Bank for Reconstruction and Development to the Executive Directors on a Proposed Water Resources Sector Adjustment Loan (WATSAL) in the amount of US \$300 million to the Republic of Indonesia, 23 April 1999.
- 8 *The result of the study can be observed in "Reforming Water Resources Policy- A Guide to Methods, Processes, and Practices-FAO Irrigation and Drainage Paper, 52, FAO 1995, www.fao.org*

- 9 *The implementation of Improvement on Water Resources Management found in the Matrix of Policy Reform – PRSL II had been planned to be carried out after June 1999 which had been planned to be divided into two parts, i.e. first, formulating national water resources policy and its implementation plan; and secondly, establishing a national agency that was supposed to formulate the policy, as well as its guidelines and strategic plan.*
- 10 *CAS Progress Report document was the revision result of CAS Indonesia issued in 1997 due to the Indonesian political and economic situation caused by the 1997 economic crisis.*
- 11 *The coordination team was formed based on the consideration that inter-departmental coordination was needed for watershed (DAS) management and for WATSAL approval. Hence, the Coordination Team was formed consisting of ten ministries for "Kebijakan untuk Pemanfaatan Sungai dan DAS yang Efisien dan Berkelanjutan"/"Policy for Efficient and Sustainable Utilization of River and Watershed (DAS)" based on Keppres No.9/January 1999. The Coordination Team was chaired by the Coordinating Minister of Economics, and deputy to the Chairman was the State Minister for National Development Planning/Director of Bappenas, and the Executive Chairman was Minister Regional Infrastructure/Kimpraswil. The members were the Minister of Home Affairs, Minister of Agriculture, Minister of Forestry, Minister of Transportation, Minister of Energy and Mineral Resources, Minister of Marine Affairs and Fisheries, Minister of Health, Minister of Industry and Trade, Minister of Finance, and Minister of Environment.*
- 12 *WATSAL Loan third stage which was supposed to be disbursed in early 2004 was cancelled due to the rejection of the government of Indonesia of several recommendations from the World Bank concerning several articles in the draft bill for Water Resources Law/RUU Sumber Daya Air.*
- 13 *Law No.7 of 2004 concerning water resource is one of water resources sector reformation's products in Indonesia*
- 14 *See "Pengelolaan Sumberdaya Air Berkelanjutan," <http://www.bappenas.go.id/blog/?p=327>*
- 15 *Source: <http://www.adb.org/Projects/summaries.asp?query=&browse=1&ctry=IND&sctr=3000&sctr=3800&sctr=3900&stat=1&type=1&type=2&type=3&type=4>*
- 16
- 17 *Wangisagara was one of the irrigation areas irrigated by the water from Wangisagara Reservoir at the upstream of Citarum River. Wangisagara Reservoir watered 1794 ha of rice fields in Kecamatan Pacet, Ciparay and Majalaya. In addition to Wangisagara Reservoir, there is also Wanir Reservoir at the upstream of Citarum River irrigating wider rice fields (+/- 17.000 ha) in the same region. In contrast with the downstream area, the upstream area sees irrigation management as the responsibility of the Irrigation Sub-Service of Bandung District instead of Perum Jasa Tirta II.*
- 18 *Actually, the farmers also pay for irrigation contribution, although not always financially. Farmers in Purwakarta who obtain water from Selokan Gede pay irrigation contribution by as many as 30 kg grains annually or 20 kg of crops annually. The contribution is used to fund restoration of damages, particularly at tertiary canal or rice field. According to Pak Sanusi, Chairman to P3A Selokan Gede, farmers were once asked to pay Rp 15.000 per hectare, but that did not work.*
- 19 *Agriculture sector's need reaches 70% of the total water needs. Although theoretically, water proportion and allocation for agriculture is very dominant, operationally and factually it is very fragile. While other sectors such as industry or domestic have allocations that are smaller and limited, in practice their supply is guaranteed to be more certain.*
- 20 *There are two kinds of rice field rental or sharecropping methods according to Bapak Dede, a farmer in Tonggak Jati Village, Karawang. In the first method, the ricefield owner pays for the medications and fertilizers, and the harvest is split into two. In the second method, medications are paid by the sharecroppers, and the harvest is also split into two. The second method is more burdensome for the sharecroppers, but some of them are willing to do it because they have no other choice*
- 21 *Bapak Eep, one of the people from Kecamatan Klari Karawang, stated that, in the past, most of the inhabitants of Klari were farmers. Currently, however, many have changed professions to become motorcycle taxi drivers, factory workers, traders, and the like because farming has become less profitable.*

KYRGYZSTAN

An IWRM Case Study:

KHODGA-BAKIRGAN TRANSBOUNDARY SMALL RIVER IN KYRGYZSTAN

AIDA NABIEVA

The Public Foundation "BILEK"

I. Introduction

Khodga-Bakirgan Trans boundary Small River (TSR), a left tributary of the Syr Darya River, starts in and flows through the Leilek district of Batken Oblast and then enters the Sughd territory of the Republic of Tajikistan. The TSR is located in the mountainous part of Leilek area and is formed by mountain streams such as those in Leylekmazar, Zhangakty, Leilek, and Andygensay as well as small drains found in the different peaks of the Turkestan Range. At the upper reaches of the river is the famous Pyramid Peak, whose height reaches more than 4,500 meters and whose mountain tops are covered by glacial deposits.

The length of the Khodga-Bakirgan River is 130 km while the basin area measures 1740 km². The river begins in the northern slope of Turkestan Range, ends with irrigation fan, and connects with the Great Fergana Canal. The source of water is mixed with a predominance of ice and snow. The average water consumption of 45 km from the bell mouth is about 11 m³/sec. The main flow occurs between October and February (50%), the largest of which is in July. It is used for irrigation and for drinking water. It is the main source of irrigation for Leilek district of the Kyrgyz Republic (more than 5000 ha) and for the Bobojon Gafurov and Zhabborrasulovsk districts of the Republic of Tajikistan (more than 25000 ha).

The natural and historical conditions of the Khodga-Bakirgan River Basin in the Leilek district of Batken Oblast are characterized by the data that follows.

Climate, Hydrography and Other Data

The area is characterized by a temperate continental climate with hot, dry and long summers and short, mild winters. A mid-day temperature of +10° C lasts for 7-8 months.

The river is a tributary of the Syr Darya River, but it does not always reach the latter due to the total volume of water that goes to irrigation during the vegetation season. However, in the spring and winter period, the river flows into the Syr Darya River. The frost-free period lasts from 200-300 days.

In a meeting between the representatives of the Ministry of Water Resources of Tajikistan and of the Kyrgyz Republic on 17-18 May 1962 with regard to the Khodga-Bakirgan River, agreements have been forged in the following areas:

1. Percentage of water allocation
2. Finding additional water resources to prevent the expansion of irrigated areas of the two republics
3. Prohibition in the cultivation of rice

Title	Middle Water Flow Amount, mln. m ³	Distribution of Water, %		Available Arable Land (ha.)	
		KG	TAJ	KG	TAJ
Khodga-Bakirgan River	310	21	79	4 968	9 000

Water supply in the studied areas of Leilek district is based mainly on its water resources, consisting of cross-border flows of the Khodga-Bakirgan River. Given the transboundary nature of the river basin water resources, it is necessary to consider these resources in terms of several factors, which include cooperative and good neighborhood relations and common development; food security; sovereignty; and, of course, the destabilization and deterioration of bilateral relations, coupled with inter-ethnic tensions, both within the local communities and among residents of border areas of Kyrgyzstan and Tajikistan.

The sociological research project in the territory of Kyrgyzstan, specifically in the Leilek district of Batken Oblast (region), covered the following pilot areas:

Watershed	Administrative Areas related to River Basins	Population 1000/person		Arible land (ha)	The number of service areas podkomandnoy River			WUA services
		1995	2010		City	Village cantons	villages	
Khodga-Bakirgan River	Leilek district	83,2	120,5	9398		5	20	3

In Kyrgyzstan, the Khodga-Bakirgan River Basin serves five municipalities, with 43.8 thousand people representing 36.3% of the total population of Leilek district. The population over the past 15 years in the area increased to 37.3 thousand people, which indicates an annual population growth of 2.486 thousand or 4.6%.

In the upper areas of the river, mainly in the foothills of sloping areas, people cultivate crops, such as apples and apricots, and cereals. In a lower terrace in the valley side, with the leads of long irrigation canals and water-lifting machines, people cultivate cereals, vegetables, melons, rice and cotton.

Analysis of agricultural municipalities located along the Khodga-Bakirgan River in Leilek district showed that the structure of sown areas, depending on the nature-climatic conditions, is different. In the remaining segments of the irrigated land area, wheat, barley, corn, vegetables, melons and rice are grown. In the Tajik side, aside from the same crops, it is cotton which is mainly cultivated.

The Choice of Pilot Areas for the Survey Research

In carrying out sociological research by the public foundation "Bilek," five pilot areas located in the basin were selected.

The zones were chosen based on the following criteria: transboundary, water availability in a heterogeneous state (e.g., rivers, irrigation canals, earthen channel, artesian wells, springs, collector-drainage network, pumping stations), reclamation, and continuity in the geographical location, that is, according to the hydrographic principle, in the upper reaches of the river where the river is formed by runoff Khodga-Bakirgan and in the lower reaches where the river flow is used by residents of three village cantons for irrigation and drinking water supply, and where the river goes into the neighboring Republic of Tajikistan.

II. The Study

In performing the tasks of the project, "Bilek" set out to examine the current situation relating to the state of water supply systems and the problems in the management of water resources in Khodga-Bakirgan Transboundary River Basin, towards developing recommendations for IWRM within the basin.

The main emphasis of the study was to work closely with target groups of participants who would be the main source of information. The relationship with the participants will be very important for the next phase, which will probably focus on further developing the action plan to improve management of water resources of the river basin and strengthening the monitoring and evaluation system to improve the institutional capacity of stakeholders to manage the river basin.

Accordingly, the foundation "Bilek," together with the expert group, carried out the following activities:

1. Conducted sampling of respondents for the poll. The study was based on the opinions of 60 residents of Leilek district, categorized differently according to where along the river basin

they live (at the beginning of runoff, in the middle, and at the end, where the border with the Republic of Tajikistan is).

2. Mapped local stakeholders of the river basin who would participate in the study
3. Developed questionnaires for the public and a guide for the focus group discussions; then gathered quantitative and qualitative data for sociological assessment.

Methods of Data Collection

The study employed the survey method, key informant interviews and focus group discussions.

The expert interviews were conducted with representatives of:

- Local authorities (district and municipal levels)
- Regional and district water management
- District Department of Rural Development
- Water Users Associations (WUAs)
- Rural Drinking Water Users Associations (RDWUA)
- Workers of the environmental and forestry agency in Leilek district

There were also individual interviews with representatives of other groups who, following gender balance, included women health care workers and leaders of women's and youth councils from different municipalities.

These key informants were interviewed using a questionnaire that included questions on the history of relations among the inhabitants of the transboundary river basin, the sharing and limitation of river flow in the distribution between Kyrgyzstan and Tajikistan, and the current ecological state of the river and its management.

Throughout the study, consultations were likewise conducted with the various water users, including women, in the form of small round tables (twice) in the main points of the river.

III. Results and Conclusions

Based on an analysis of the survey, interviews and focus group discussions, the following conclusions were derived:

Profile of Respondents

Respondents were selected based on age, gender, educational attainment, and family size. It should be noted that the number of family members surveyed ranged from 3 to 6 people, indicating that families in rural areas tend to have many children. Also, this factor suggests that population growth is a direct derivative of the future development of rural areas, which are both consumers of natural resources, will continue to grow, and many social and economic problems of human settlements near the river will affect them directly.

Use of Water Resources

Survey findings show that on the issue of the population's access to irrigation water, only 45% of the respondents have constant access, 50% have partial access ,while 5% have no access at all. With regard to the awareness of the integrated management of water resources, no one seems to be aware among the population. Water service workers, on the other hand, responded affirmatively to this question.

Extent of Public Participation in Water Management

Most of the respondents are aware that the WUAs (Water Users' Associations) represent the local water management body. Based on the degree of relationship on water resources, the respondents see hydro technicians and government officials as participants in the negotiation process on water issues. Majority also approve of public participation in the negotiation process, which show their desire to take an active part in these processes, or at least be informed about the decisions taken on this issue.

Suggestions for Improving Water Management in the Khodja-Bakirgan River Basin

Most of the expectations and recommendations of the respondents involve the following:

- Rehabilitation of irrigation canals and hydraulic structures
- Two-way exchange of reliable information on crops (both countries)
- Preparation of long-term agreements with regard to the obligations of the parties
- Exchange of good practices in resource-saving technologies
- Trainings on agribusiness, technology of processing, growing and watering crops, horticulture development, as well as promotion and marketing of agricultural products
- Coaching of former professionals in the field of water and getting different advices from international organizations on the development of farming and the use of water power for the needs of rural residents (e.g., construction of small hydropower plants)

On the Future Form of Management of Water Resources

- Establishment of a Council of Elders.
- Creation of a River Basin Commission for the long-term to replace the current Basin Committee

Respondents in the selected pilot areas shared their vision and focused on the following priorities for the future:

- Building a reservoir together with neighbours
- Rehabilitation and modernization of irrigation channels, and increasing their capacity and efficiency
- Training for new and efficient methods of irrigation to save water

Climate Change and Environmental Degradation

Assessing the environmental situation in their territories, the majority of respondents noticed significant climatic changes in the river basin as compared to previous years. Most of the observed changes concern the biodiversity of flora and fauna, several species of which were found to have been reduced significantly. Natural disasters such as floods and landslides have led to the degradation of soil cover. Many people believe that human activities have impacts on these ecological systems.

Foreign Aid for Rural Development

Majority of people on the ground believe that any intervention in or assistance for the water sector coming from international organizations or the state to help solve the problems of water supply could contribute towards the improvement of their lives.

Conflict Prevention

On problems or conflicts over the use of water resources at various levels, all respondents (100%) indicated that there indeed exist differences, tensions and disputes over water. Most respondents

revealed that they have responded to the conflicts in water allocation within the community. Regarding conflicts between neighboring communities, respondents were more inclined to believe that such conflicts occur only periodically and are not systemic. Some respondents had witnessed some of the conflicts, in which officials of water services like mirabs (community water managers), directors of the WUA, or employees of Rayon Department of Water Facilities (RDWF) were involved.

To avoid conflicts over access to water resources, the respondents offered the following:

- Rational use of water
- Carrying out explanatory work among the population
- Supervising the work of mirabs
- Drawing up agreements

Respondents also shared the following risk factors for irregularities in the existing contract on water:

- Tightened border controls and police presence over ordinary people and vehicles
- Strengthening trade relations
- Verbal recriminations among the population and, therefore, manifestations of bullying among young people and involvement of criminal elements
- Ethnic conflict that could escalate into a collision

When asked how the organization can play an effective role in preventing conflicts between neighboring border communities of both countries, which have been brought about by lack of access to water, ordinary citizens preferred the local authorities and the Council of Elders to assume the primary role. Based on the focus group discussions, respondents preferred water bodies like Basin Department of Water Facilities (BDWF) and RDWF.

Awareness of the River Water Allocation in Khodja-Bakirgan Between Kyrgyzstan and Tajikistan

Survey findings reveal that the awareness of Khodga-Bakirgan River is limited, with a sizeable 42% of respondents not having any awareness of it. At the same time, more than 30% of the respondents living in the upper reaches of the river said they did not know or did not have a general idea about the shared water allocation in the river flow of Khodga-Bakirgan between Kyrgyzstan and Tajikistan. This is explained by the fact that residents in the upper reaches do not experience the practical problems and issues in allocation that occur in the cross-border zone.

Currently, the Kyrgyz side, according to an intergovernmental agreement in 1962, is in compliance with the principles of agreement on river flow of Khodga-Bakirgan, and withdraws 21% of the volume of runoff while the Tajik side withdraws 71%.

In the survey, all respondents from among the employees of the water department and the local authorities at the district and regional levels, as well as heads of municipal agencies, believed that it is necessary to revise the existing agreement on water distribution. The current limit does not satisfy the water needs of Kyrgyz citizens, even as the growing population in the Kyrgyz territory needs to explore new agriculture lands.

- Under the current system, Khodga-Bakirgan irrigates more than 5.0 hectares. There is shortage of water consumption of about 10 million m³.
- The Margunsk land, part of the lower river terraces, and the southern part of the Arka are not irrigated.
- Nobody uses the winter runoff of the Khodga-Bakirgan River, therefore, there is a need to raise the issue of building the Leilek reservoir in the river.

Construction of the reservoir in Leilek will:

- Convert an array of machine arch to gravity irrigation, and save energy
- Further develop new irrigated land in an area of 4400 hectares (including the Margunsky array of 2.5 hectares and the southern part of the Arka array of 1.9 ha).

According to preliminary calculations, the total volume of stream flow in the Leilek reservoir is 80.0 million m³, of which 78.0 million m³ is considered useful, while the amount of silt that has deposited in 50 years is around 4.0 million m³.

For the construction of the Leilek reservoir, the decision to increase the limit of Kyrgyz intake from Khodja-Bakirgan River by eliminating the limit of Kayrakum reservoir to 77 million m³ can be negotiated with the Tajikistan Party. For this purpose, according to government officials of the Batken region, the Kyrgyz side of the river should take at least 50% of river flow.

It should be noted that the reservoir construction will be useful and cost-effective for the Tajik side as well.

Satisfactory Percentage Allocation

- Majority of respondents (95%) from the focus groups related that it was necessary to revise the existing agreement and make the ratio of allocation 50-50.
- A small percentage of respondents (5%) said that because the river originates in Kyrgyzstan, then part of Kyrgyz must first meet its own needs before giving to neighbors the excess runoff.

The Possibility of IWRM in Khodga-Bakirgan

On this issue, 70% of participants believed that such is possible, provided that clear legal and regulatory documents are adopted that meet the needs and interests of the parties, and that it is subject to approval by the government and the legislative bodies of the countries involved.

At the same time, 30% of respondents said that they see little benefit from the integrated water resources management, as they believe that the current state is already quite satisfactory, and that any other changes can lead to unpredictable consequences in bilateral relations.

IV. Implementation of IWRM for TSR Khodga-Bakirgan

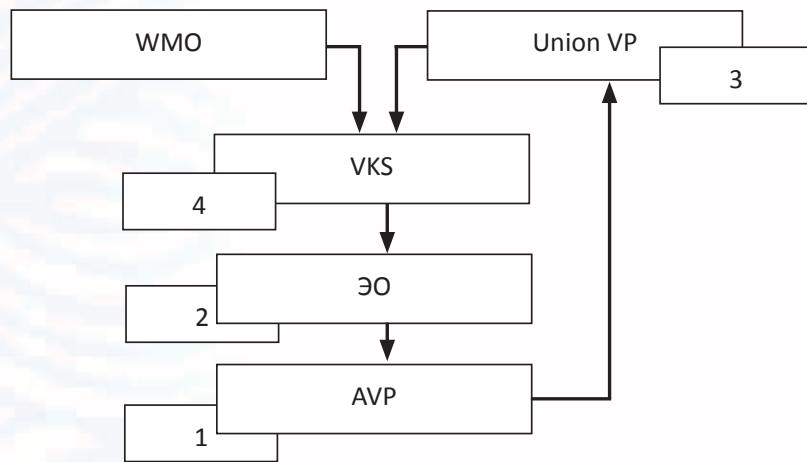
The key IWRM institutions that have been identified on the Kyrgyz side during the discussion on the process involved in hydro graphic principle are three (3) WUAs, thereby indicating 100% participation. From the Tajik side, 9 out of 12 Water Users Association and the Association of Farmers are involved, which indicates 75% participation.

There was the establishment of a Sub-Basin Water Committee (SBWC), a joint management body that consists of water management organizations from both sides, local authorities, and other interested parties. This water committee will provide the overall leadership and the operational authority to engage in sub-basin issues and in the maintenance of irrigation systems and water delivery to water users such as WUAs, ADH and others water users.

Currently, the implementation of IWRM at the Khodga-Bakirgan River is being addressed by two donors, namely, in a project of the Swiss Agency for Development and Cooperation (SDC) and in the IWRM-Fergana project of the German Center for International Cooperation (GIZ). Both organizations, as part of their project goals and objectives, want to see the following models of cooperation in IWRM for TSR Khodga-Bakirgan.

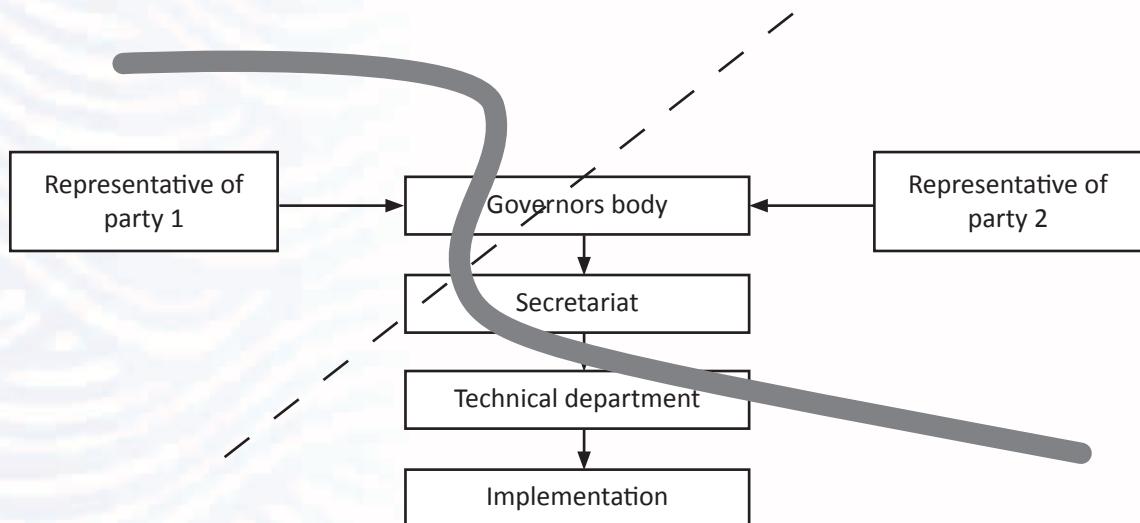
1. Ongoing work by the SDC and the "IWRM-Fergana" project involves the introduction of the following models or schemes of cooperation:

Model of the IWRM project SDC



1. The operating agency/ management
2. The union of the water users
3. A joint guiding agency, the Water Management Systems Committee in TSR Khodga-Bakirgan.

The GIZ project suggests the following structure:



These suggest that this process is only in the initial stage of organizational development. And to date, the SDC project has conducted two rounds of negotiations or bilateral consultations on the possible format and content of some cooperation agreements at the local level (i.e., at the level of municipalities and districts), with the participation of the donor. However, no legal formalities were adopted during the bilateral consultations.

Therefore, the project IWRM-Fergana will, as before, coordinate their actions with those of the project from GIZ, since both projects are working towards one direction.

On the feasibility of linking several river basins, the parties have expressly called for the establishment of basin-wide patterns separately for each pool so as not to disrupt their hydrography and aggravate the specific problems inherent in each basin, thereby creating unnecessary confusions.

So in discussions about the Khodja-Bakirgan River Basin, there must be mention of a river commission. This should be the case for as well for all other rivers for which river committees should be created.

Based on the foregoing, we conclude that the process of integration involves a positive dynamics of development. This current study voiced the concerns and positions of the different parties.

At the moment, the immediate goals of donor organizations and the Interagency Working Group (IWG) include the convergence of views on approaches and the coordination of steps and options for linking the approaches of the two projects, as well as the seeking of opportunities to establish a regional fund that would stimulate cooperation on Transboundary Rivers.

V. RECOMMENDATIONS

Conflict Prevention

To prevent conflicts in the joint integrated water resources management of the TSR Khodga-Bakirgan basin, the following are recommended:

1. Establishment and operation of a permanent interstate river basin commission
2. Compliance with existing agreements on the use of water resources
3. Development and execution of new agreements about legal and legislative aspects of water resources
4. Improvement of accounting of interstate water allocation and its transparency
5. IWRM in transboundary rivers should be considered in conjunction with other unresolved issues, such as the delimitation and demarcation of borders, strengthening of customs and border control measures that lead to the use of leverage between the two countries.
6. You cannot consider issues on IWRM in the river basin without regard to the interests of the parties involved in other water agreements. For example, donors want to establish IWRM only in Khodga-Bakirgan River while paying little attention to the problem of water supply in the array of Arka, where the previous agreements were violated by Tajikistan during the last 15 years by misappropriating irrigation water from the Kairakum reservoir.
7. Donor organizations, in order not to trigger conflict, need to adopt a balanced approach by taking into account the interests and positions of the parties and not just be focused on the implementation of project goals and objectives.

Information Campaign

It is imperative to conduct public outreach activities to raise awareness on the need for cooperation in managing transboundary water resources. These can be accomplished by way of the following:

1. Develop and produce brochures, booklets, and information sheets which are made available in the local languages;
2. If possible, establish contact with the agricultural advisory services or project teams of international donor organizations to involve them in the design and conduct of trainings for people living along the transboundary rivers. The trainings could be on the following topics: water and soil conservation technologies, farming practices, water accounting, financial stability and transparency in WUA, among others.
3. For donor organizations like SDC and GIZ to carry out their project goals, it is recommended to involve NGOs from both sides in conflict studies that would account for all risk factors associated with conflict, in the facilitation of negotiations, and in public opinion studies.
4. During information campaigns, use booklets, various bulletins and special editions that highlight the opinion of media experts.

5. When working with the public, draw attention to the plight, particularly the gender issues, of vulnerable sectors of society.
6. Provide training on environmental topics for the public.

Institutional Development of Water Management Bodies

To enhance the institutional development of water management bodies, the activities below need to be carried out:

1. Conduct regular seminars on essential topics for employees of water services at the level of the WUA and for the employees of district water management bodies.
2. Introduce the practice of mentoring within WUAs.
3. Organize exchange visits for workers to share their positive experience.
4. Provide training, retraining and skills development.

Technical Support

To improve the stability in water management, the following are proposed:

1. Attract international donors for the rehabilitation of irrigation canals, waterworks, drainage networks and pumping stations on different sides, and for the implementation of joint projects.
2. The Local Water Management Institute should engage in small projects that would address local issues, with the broad participation of community representatives, including those with a gender perspective.
3. The Union of WUA should establish a technical base and acquire a loan for ground excavation equipment (such as bulldozers and excavators), dump trucks, and welding apparatus.
4. Increase public awareness and practical solutions to problems related to the use of water resources, which could convince the public of the project's benefit to local communities.

The Institutionalization and Implementation of IWRM Principles

- IWRM projects implemented and funded by the Swiss Cooperation Office, as well as similarly approached projects of GIZ and of an interagency working group, require the coordination of steps and options for inclusive management of the transboundary river. The unresolved issues on limited use of water from Khodga-Bakirgan River due to an old Soviet agreement (Kyrgyzstan uses 21% and Tajikistan uses 79%) might lead to the failure of the proposed models on IWRM as Kyrgyz citizens insist, and will continue to insist, on 50% of the water distribution flow. Under such conditions, it is possible the ideas proposed and partially implemented by donors, according to the focus groups, will be untenable. Perhaps, therefore, it is somewhat premature to implement IWRM at TSR-Khodga-Bakirgan.
- Water service groups of the highest rank in the regional and national levels should develop clear and precise measures on integrated approach to planning and management of water resources, or a national water strategy and basin water plans.
- Upgrade the existing technical base and outdated technologies for monitoring the status and use of water resources.
- Achieve a common understanding of approaches in implementing the key principles of IWRM. For instance, apply the hydrographical principle of management, a vertically integrated water resources management, and the coordination of public institutions under the Water Code of the Kyrgyz Republic. At the legislative level, the parliament should change the existing Water Code, with clear mechanisms for implementation of the articles, approaches and principles of IWRM.

- Senior government water sector employees at the local level should seriously take into account public opinion because the direct beneficiaries and key stakeholders are ultimately the ordinary citizens. Do not follow donors for the sake of short-term interests to remedy the situation or investment in the water sector.

References

1. *Bulletin of the WUA, the World Bank Project "Farm Irrigation" № 7 edition 2011.*
2. *The report of the IWRM-Fergana. IWMI-Central Asia, September 2011*
3. *Water Forum, CA & C countries dialogue (Astana, 14-16 july 2008), NGO Forum on ADB*
4. *Environmental security and civic initiative, OSCE, Tashkent, 2011, editor D. Zainutdinova*
5. *The design of the book developed by the institute "Sredazgiprovodkhlopok" them. A.Sarkisova. "Upgrade Leilek land area of the river Hozhabakirgan", Tashkent 1989*
6. *Reports Leilek DDWR Runoff River from 2001-2010, Hozhabakirgan.*
7. *Reports and booklets project of the German Technical Centre for Cooperation, GIZ «TUVRTSA»*
8. *Statistical data of the Department of Agriculture Leilek district, Ministry of Agriculture and Land Reclamation of the Kyrgyz Republic with the years 1991-2011.*

PHILIPPINES

Privatizing Forests and Water:
The ADB-INREM
PROJECT IN THE UPPER
BUKIDNON RIVER BASIN

ANANEZA ABAN
ARZE GLIPO
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STUDY BACKGROUND

The Philippine government adopted an international framework called Integrated Water Resource Management (IWRM) with the aim to harmonize all the obligations of government institutions in water resource development and management.

Believing that water is an economic good, the Asian Development Bank (ADB), under its Water for All policy framework, has been pushing for governments to adopt IWRM which follows the concept of river basin as a framework for water resources planning and investment.

While this appears beneficial to all stakeholders concerned, the devious part is in its details as the underlying objective of this framework is the commercialization of water and natural resources, which is detrimental to many communities who depend their lives and livelihoods on these resources. IWRM therefore becomes a threat to the people's fundamental right to these important resources.

IWRM treats water and forest resources as economic goods instead of defining them as public goods where people or communities share them and over which they have certain traditional rights. To promote efficient utilization and conservation of water, IWRM institutionalizes water pricing and tradeable water rights.

As a complementary strategy in promoting IWRM in the country, ADB is also financing the Integrated Natural Resources and Environment Management (INREM) program in response to the Coral Triangle Initiatives and linking it to the climate change initiatives of the United Nations Framework Convention on Climate Change (UNFCCC).

This study will highlight the present condition of one of the INREM target areas financed by ADB, the power relations between communities and private corporations operating their business in the area, and the foreseen effects of INREM on the people and their surrounding environment.

METHODOLOGY

This is a case study of the Upper Bukidnon River Basin focused on the Kitanglad-Manupali Watershed and its relation to the downstream of Pulangi River system. Field visits were primarily done in the Municipalities of Lantapan and Talakag because of the rich information available concerning watershed management and because these are home to the indigenous peoples (IPs) who have deep connection with Mt. Kitanglad. Interviews with other government officials were done in Malaybalay City, the seat of the provincial government and other government offices.

Several data-gathering methods were used in the study. Semi-structured interviews were conducted with key stakeholders who were chosen based on their substantial knowledge about their situation, natural resources management and ancestral domain claims; they must be based in the province where the ADB shall commence its INREM project. The study also relied on referrals in selecting key informants. Study participants included affected IP farmers, tribal leaders, women tribal leaders and government officials.

Primary data was gathered through documents review from the relevant database of international financial institutions- ADB and GEF. Other pertinent information for the related literature such as reports, maps and photos were collected from Philippine government agencies: DENR and its attached agencies (NWRB, EMB, PENRO-Bukidnon), NIA, and DPWH-BRS, the provincial government of Bukidnon (BENRO and PPDO) and Municipality of Lantapan; non-government organizations; and mainstream media. A significant part of the review was culled from online database.

Participatory research methods were also employed. A river transect with farmers was done in Maagnao River, which is part of the study site. This was followed by a transect tour in Talakag with the participation of an IP resident in the area.

This study attempted to do participatory action research by organizing a research consultation with leaders of different tribal groups in Bukidnon to present the preliminary findings of the study,

validate the data and analyze the implications on their respective ancestral domain claims. Resource mapping was done to present the current situation of the respective areas and highlight their interconnectedness through Pulangi River. Action planning culminated the activity to establish the relevance of this research to their local struggles.

SCOPE AND LIMITATION

Given the huge geographical location of the Upper Bukidnon River Basin, the focus of this study is on Mt. Kitanglad which is the headwater of the river basin. Data and some issues concerning Pulangi River were included in this study because the different tribes in Bukidnon have a significant convergence in this particular river. Pulangi is also an end recipient of changes that transpires in the headwater.

Field visits, including interviews with key informants, were done in April 2011. A research consultation was organized after the preliminary findings of this research were prepared. Presentation of the study is focused on the perspective of key stakeholders on social, cultural and environmental conditions of their area, and the implications of ADB's intervention.

INTRODUCTION

As current patterns of production and consumption continue to put increasing pressure on the world's ecosystems, water has become increasingly scarce, especially to poor smallholders and households who are dependent on water for their livelihoods and survival. In many countries, water shortage, as well as declining water quality, is posing increasing constraints to meeting their food security and development goals. Unfortunately, recent policy responses have focused more on water management approaches rather than looking at the structural causes of the problem. International financial institutions like the Asian Development Bank have been leading the chorus for developing countries to address their water-related problems through the Integrated Water Resource Management (IWRM). Under its 2006-2010 Water Financing Program, ADB targeted the introduction of IWRM in 25 river basins in the Asia-Pacific region.

IWRM is defined as a "process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems." (GWP, 2000) The concept seeks to promote water as a commodity that can be traded and thus opens up water as a new area for private sector investment. The notion of integration is introduced which links freshwater to coastal zone management, land and water management, and the institutions and actors involved in water-related management are integrated, including, and more importantly, the private sector. This veers away from the traditional concept that water is a common good and hence its use, development and management remains within the purview of the state.

ADB's water-related financing programs are thus seen to contribute to the mainstreaming of IWRM policies in client countries. In the Philippines, ADB has financed more recently the implementation of the Agusan River IWRM and the \$120 million Integrated Natural Resource and Environment (INREM) Program.

The INREM Project of ADB

The INREM with Project Number 41220-01, sourced from ordinary capital sources, is a sector loan that will institutionalize effective watershed management regimes in four upper river basins in the Philippines, namely: i) Chico River Basin in Cordillera Administrative Region (CAR), Northern Luzon island, (ii) Wahig-Inabanga on the island of Bohol, (iii) Lake Lanao Basin in the Autonomous Region of Muslim Mindanao (ARMM) and Upper Bukidnon River Basin in Bukidnon.

According to its project proposal, INREM will ensure that the four upper watershed areas with high biodiversity value are sustainably managed while improving the quality of life of local natural resources. Moreover, it seeks to improve the livelihoods of the poorest inhabitants while achieving substantial environment benefits in the form of reduced losses of carbon stocks and change to net sequestration of carbon dioxide (CO_2), reduced erosion from unsustainable agriculture on steep slopes with beneficial impact on downstream water users, especially hydropower generation and irrigation, and increased biodiversity and reduced threats to important indigenous species in coastal and marine ecosystems.

The components of the project include the formulation of the river basin, watershed management and investment plan, smallholder/commercial/institutional investments, capacity strengthening for river basin management, and project management. Component 2 discusses the initiation of functional contracts for payment for environmental services. Activities under this component will also support improvement in production forests and agricultural lands that will have tangible benefits in reducing CO_2 emissions (GEF 2010).

Under INREM, the Department of Environment and Natural Resources (DENR) will be the Executing Agency (EA) and assume full supervision and responsibility in the administration and management of the Project.

Linking INREM to the Coral Triangle Initiative (CTI)

Governments of the Coral Triangle Area namely Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste signed an agreement through the Coral Triangle Initiative (CTI) to adopt a 10-year plan of action to avert the growing threats to the regions' coral reefs, fish, mangroves and other vital marine and coastal living resources (GEF 2010).

The Global Environment Facility (GEF) is the largest fund contributor to the CTI which endorsed US \$63 million to the program that covers biodiversity, international waters, and adaptation to climate change activities. It has likewise mobilized more than US\$300 million of co-financing for tuna and coral ecosystem conservation. The ADB as the coordinating agency accompanied the planning together with FAO, UNDP, UNEP and the World Bank. Currently, US \$45.5 million (76% of the funds) has already been allocated for the implementation of nine (9) projects in the six (6) participating countries. One of them is the CTI-INREM of ADB in the Philippines which the GEF Council approved in June 2009 (GEF 2010).

To link the upper river basin with the coastal and marine resources, ADB in its INREM proposal to GEF said that sustaining marine life and coral reef ecosystem in the Philippines will depend on how well the uplands and watersheds are managed and protected from destructive human interventions. The ADB identified degradation and overexploitation of watersheds as the major contributor to increasing poverty, loss of livelihood, and unequal access to resources and services (ADB 2011).

Brief Profile of the Upper Bukidnon River Basin

The Upper Bukidnon River Basin traverses the provinces of Bukidnon, Misamis Oriental and Lanao del Norte. The ADB has identified this river basin to have very little remaining forest cover as a result of uncontrolled logging activities during the early 1960 until 1980s. The headwaters of this river basin originate in Mt. Kitanglad Natural Park and drain to the municipalities of Manolo Fortich, Sumilao, Malaybalay City, Lantapan, Talakag, Baungon and Libona, all within Bukidnon province (ADB 2011).

Mt. Kitanglad Range Natural Park, established under Republic Act 8978 of 2000, is recognized as one of the most important biodiversity reserves in the country with a total of 47,270 ha. Its protected area is 31,235 ha and an additional 16,035 ha is identified as buffer zone. Situated within the

Kitanglad-Ligawasan terrestrial biodiversity corridor which supports the richest known vertebrate fauna (mammals and birds) in the country, it is likewise considered an extremely high urgent area for terrestrial biodiversity conservation, a very high priority area for conservation of plants, and an extremely high priority area for conservation of birds and mammals. Kitanglad is the habitat of many endangered, endemic, rare and economically important species of animals and plants. Sightings of the critically endangered Philippine Eagle (*Pithecophaga jefferyi*) were observed in its forest (ADB 2011, Garrity, et al. 2001).

Hydrology of the Kitanglad-Manupali Watershed

The province of Bukidnon is identified as a critical watershed which hosts the headwaters of six major rivers in Mindanao, namely: Pulangi, Tagoloan, Cagayan, Maridugao, Agusan Cugman and Davao Salug rivers (See Figure 1),¹ and which supplies water for domestic, irrigation, agro-industrial, commercial and hydroelectric power generations in several provinces. Continuous flow of water is dependent on the condition of the upper Bukidnon river basin (Calingasan 2011). The Pulangi River, which is one of the major rivers found in Bukidnon is comprised of Upper Pulangi with a total area of 296,153 hectares and an annual discharge of 16,399 mcm, and the Lower Pulangi which cuts through Central Bukidnon and Cotabato provinces and drains down to the Illana Bay.

The Manupali watershed traverses the upper part of the Pulangi River Basin and has a total area of about 38,150 hectares (has.), of which 23,052 has. (60 percent) falls within the Municipality of Lantapan in the province of Bukidnon. Its sub-watersheds Alanib, Maagnao, Kulasihan, Tugasan and Timago are also located in the same municipality (Lantapan LGU, 2002). Almost all of Lantapan is

found within the Manupali watershed. The headwaters of the Manupali river come from the Mt. Kitanglad range.

Likewise, the headwaters of the rivers of Maagnao and Timago are within the Mt. Kitanglad Range Nature Park. Maagnao River basin has a total land area of 3,595 has., of which 1,553 has. are timberland and 2,042 has. are classified as A&D (alienable and disposable) lands. Timago River is about 11 kilometers (Lantapan LGU 2002).

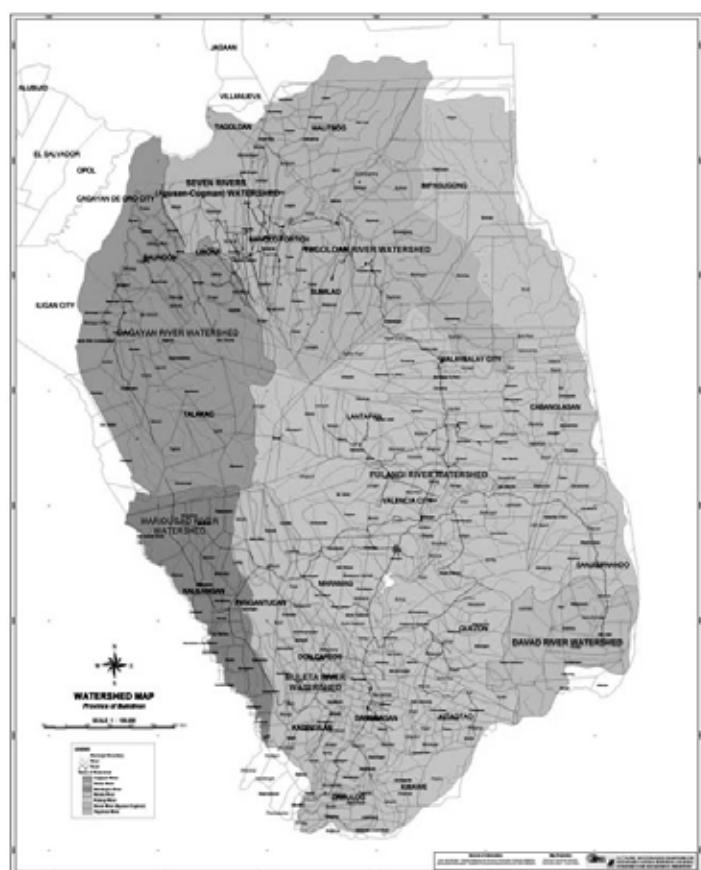


Figure 1: Watershed Map of the Province of Bukidnon

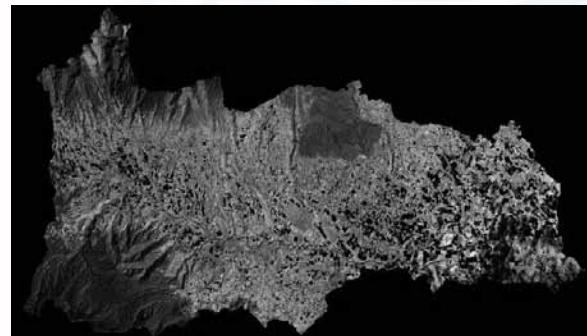


Figure 2: Satellite map of the Manupali watershed²

The Manupali River, as a tributary of the Upper Pulangi River, is an important water source that supplies water for the Pulangi IV Reservoir and generates hydroelectric power. It covers an approximate area of about 12,260.80 has., with a volume of surface run-off of 19,260,810 cubic meters and with an approximate volume of 19,260.80 cubic meters of sediments (Lantapan LGU, 2002).

Manupali River also provides water for the Manupali River Irrigation System (MRIS) that was constructed in 1979 and completed in 1989 to serve the farmlands in the municipalities/cities of Lantapan, Malaybalay and Valencia. The MRIS is currently being managed by the National Irrigation Administration (NIA). Its design was to irrigate 6,060 has. of farmlands but the actual service area is 4,395 has. The water permit obtained from the National Water Resource Board (NWRB) in 1978 was 8,000 liters per second. The river discharge during that time was still substantial (Andilab, et al., 2007).

Based on the DENR water quality monitoring report in 2002, Pulangi River passed the DO and BOD Standard and is considered Class A river or waters which require complete treatment (coagulation, sedimentation, filtration and disinfection) in order to meet the Philippine National Standards for Drinking Water (DENR, 2000-2008) (See Table 1). However, the 2009 data from DENR revealed that Pulangi River is classified as Class D category (Tuddao, 2012) which allowed for agriculture, irrigation, livestock watering and cooling in industrial facilities (DENR, 2000-2008).

Table 1: Water Quality Monitoring: Year 2002-2003 (mg/L)

Region	Water Body	Class	2002				2003			
			Average		Conformance with the Standard		Average		Conformance with the Standard	
			DO	BOD	DO	BOD	DO	BOD	DO	BOD
9	Saaz River	B	6.93	2.8	Passed	Passed	8.1	1.8	Passed	Passed
9	Mercedes River	C	5.37	5.02	Passed	Passed	5.7	3	Passed	Passed
9	Cabaluay River	C	5.89	4.42	Passed	Passed	6.1	2.5	Passed	Passed
9	Manicahan River	B	6.16	3.89	Passed	Passed	7.4	1.8	Passed	Passed
9	Bolong River	B	6.01	3.31	Passed	Passed	11.1	-	Passed	-
9	Cawa-cawa Beach	SC	5.3	4.57	Passed	Passed	-	-	-	-
9	Golf Course Beach	SC	7.2	2.84	Passed	Passed	7.1	2.9	Passed	Passed
9	La Vista del Mar Beach	SC	7.9	2.7	Passed	Passed	7.2	2.4	Passed	Passed
9	Patalon River	B	6.96	2.17	Passed	Passed	7.9	1.8	Passed	Passed
9	Tumaga River	C	5.65	6.67	Passed	Passed	5.6	4	Passed	Passed
10	Cagayan de Oro River	A	8.52	2.11	Passed	Passed	8.6	1.2	Passed	Passed
10	Iponan River	A	8.42	2.39	Passed	Passed	7.6	3.8	Passed	Passed
10	Tagoloan River	A	7.97	1.91	Passed	Passed	8.6	1.5	Passed	Passed
10	Umalag River	C	6.24	3.86	Passed	Passed	6.3	3.2	Passed	Passed
10	Samay River	A	8.39	2.16	Passed	Passed	-	-	-	-
10	Cugman River	C	7.63	2.6	Passed	Passed	-	-	-	-
10	Raagas Beach	SB	7.28	-	Passed	-	13.3	-	Passed	-
10	Roan Beach	SB	6.82	-	Passed	-	7.1	-	Passed	-
10	Acuna River	A	6.73	-	Passed	-	7.5	-	Passed	-
10	Naawan River	C	7.39	2.03	Passed	Passed	-	-	-	-
10	Bulua Creek	C	3.32	34.65	Failed	Failed	-	-	-	-
10	Pulangi River	A	7.55	2.48	Passed	Passed	-	-	-	-
10	Macajalar Bay	C	6.72	-	Passed	-	7.2	-	Passed	-
10	Tumalaong River	A	-	-	-	-	8.0	-	Passed	-

Notes:

- 1) DO - Dissolved Oxygen
BOD - Biochemical Oxygen Demand
- 2) Guideline values for DO: 5.0 mg/L (minimum)
BOD : 7.0 mg/L (maximum)
- 3) (-) means Data not Available

Source: Water Quality Section, Environmental Quality Division, Environmental Management Bureau

Problems within the Kitanglad-Manupali Watershed

Based on interviews and focus group discussions with tribal community leaders, NGOs and key personnel from the provincial and local government, a number of critical issues and concerns were raised on the state of the Manupali watershed ecosystem as well as other watersheds in Bukidnon. Some of these were also mentioned in the watershed management plan of the Municipality of Lantapan (Calingasan 2011, Lantapan LGU 2002).

These include the following:

- The rapid increase in population and continuing slash and burn farming have caused rapid denudation in the upland areas, particularly in the last two decades. The Year 2005 spot map revealed that Bukidnon's forest cover is only 25 percent and is located mainly in the headwater mountain slopes. This resulted to a corresponding decline in genetic diversity.
- Rapid rainfall runoff and severe soil erosion have been aggravated by flashfloods, landslide and siltation in the rainy season, alternating with worsening drought and destructive fires in the dry season.
- Inadequate river flow, especially in the dry season failed to sustain irrigation and hydroelectric power generation;
- Competing water use has intensified, especially between smallholders and plantations/commercial farms; and
- Declining water quality.

Fifty four percent (54%) of the total land area in the municipality of Lantapan is devoted to agriculture, while the rest are forest, built-up and open spaces. Further, land classification of the province of Bukidnon, as of 2002, revealed that about 39% of the land area was classified as alienable and disposable while 61% remained as forestlands. The actual vegetative cover however by then had already dwindled to less than half. This means that more than half of the forest lands had been cleared and cultivated. Logging and the entry of commercial plantations contributed to the rapid denudation of forests in the province. Migrants who came from farming communities as far as the Visayas and Luzon settled and established small farm lots, often driving away the indigenous tribes which inhabited the slopes of Mt. Kitanglad ranges.

As forest resources were degraded and large tracts of upland areas converted to plantations, poverty worsened among the tribal communities and even among erstwhile upland settlers. The lack of inputs, low farmgate prices, and the absence of roads and infrastructure all conspired to limit productivity and incomes of farmers and indigenous peoples from farming. Eventually, they were forced to lease and sell their lands to big companies and eke out meager wages as plantation workers. Many were driven to cultivate intensively ecologically fragile areas that are prone to soil erosion to meet their daily needs.

Soil erosion and the degradation of the watershed have resulted to declining discharge flow from the Manupali River and other major rivers during summer months (March to June). Moreover, NIA admits that during heavy rains and flashfloods, the irrigation dam and canals have become heavily

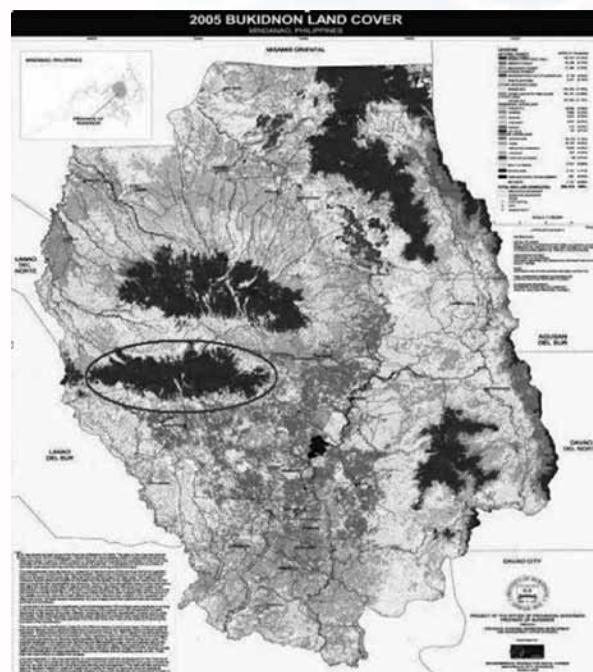


Figure 3: Dark green areas are the remaining natural forest cover left in Bukidnon

silted, obliging them to conduct regular dredging. The sedimentation results to reduction in the MRIS' capacity and reduces irrigation service to farm beneficiaries. It has likewise affected the quality of the hydropower plant in Pulangi River (Duque, et al., 2001). The amount of silt deposited at the Upper and Lower Pondage Area of the reservoir is estimated at 26,600,000 cubic meters which greatly reduced its design live storage capacity by up to 30 percent (Duque-Piñon, et al., 2011).

NIA blamed the failure of the reforestation program to reach its target of reforesting 4,543 hectares as only 1,253 hectares were planted because most of the identified areas for reforestation were privately owned or had claimants despite the declaration of Manupali as a 'critical watershed' by virtue of Presidential Proclamation No. 127 (Andilab, et al., 2007).

A recent report (Calingasan, 2011) affirmed these issues which highlighted the contribution of deforestation, as well as the (See Figure 4)³ expansion of banana and pineapple plantation in Bukidnon, to the decline in water supply, degradation of water quality and siltation of irrigation canals in the province.

The worsening water condition is also evident in the water balance of the two sub-watersheds, Alanib and Kulasihan Rivers, which are the major tributaries of the Manupali River. The increasing water demands from different groups of users seem to have significantly influenced the changes in stream flow patterns and water level supply (See Table 2).

Table 2: Average Water Balance of Two (2) Sub-Watersheds of Kitanglad-Manupali During a 12-Year GenRiver Simulation

No.	Dynamics of water	Alanib sub-watershed		Kulasihan sub-watershed	
		Computed (mm)	Simulated (mm)	Computed (mm)	Simulated (mm)
1	Precipitation	2272.36	2260.34	2300.67	2222.09
2	Evapotranspiration		760.42 (34)		1058.50 (44)
3	Other losses		654.94 (29)		401.61 (17)
4	River flow		844.98 (37)		980.35 (41)
	• Run-off	496.12	516.49 (23)	535.20	536.90 (23)
	• Soil quick flow		≥0.00		31.00 (1)
	• Baseflow		328.49 (15)		≥0.00
	• Surface quick flow				412.45 (17)

Source: Provincial Government of Bukidnon, 2011

Competing Use and Control over Water

Multiple water users in Manupali

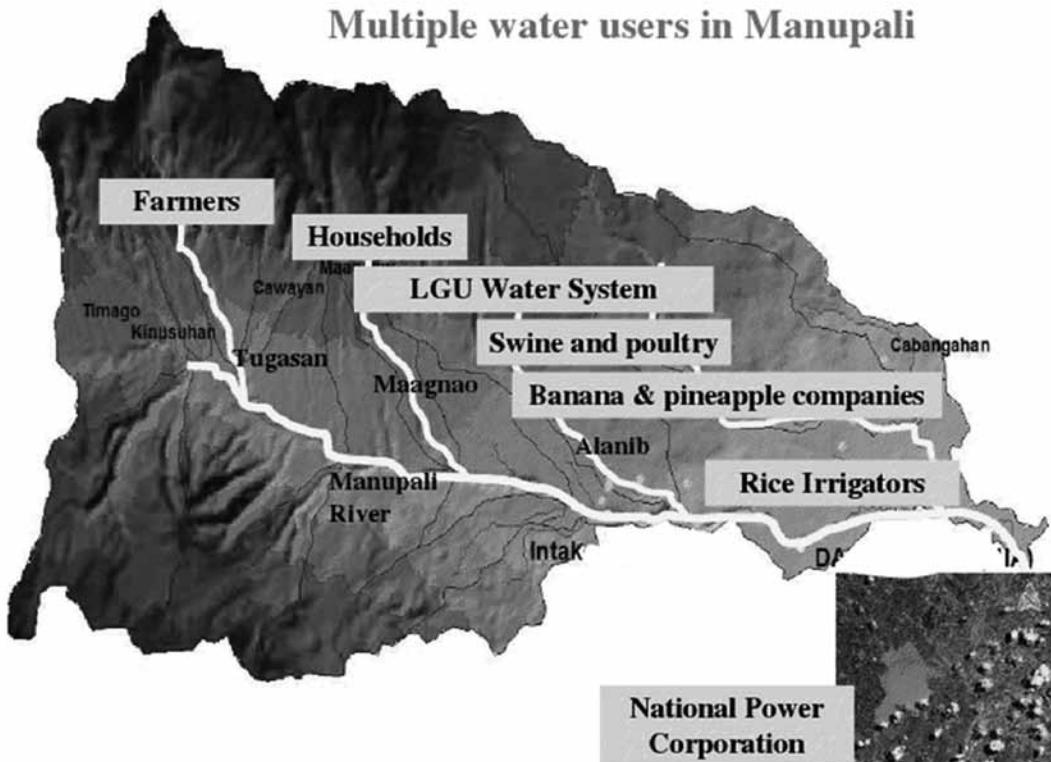


Figure 4: Water user-competitors within the Manupali Watershed⁴

The Municipality of Lantapan has an estimated population of 57,000 people. There are currently 5,000 households serviced with Level 3 water system while the rest gets water directly from streams in their nearby location. The National Water Regulatory Board (NWRB) issues the permit for use of water from different sources. The Municipality of Lantapan gets water for domestic use from the Hagpitán Spring while a local barangay, Brgy. Bugcaon, gets water from the deep well (See Table 3).

Domestic consumers within the Manupali River and its tributaries are but a minority compared to water permittees that are multinational corporations. The provincial government recognized that these agribusiness companies such as banana and pineapple plantations extract a bigger volume of water from the river upstream after the NWRB granted them water permits, thereby reducing the water discharge for domestic use and for existing irrigation systems downstream (See Table 3).

Some of the major agribusiness companies in Bukidnon are Del Monte Philippines, Inc. for pineapple production; the Bukidnon Sugar Milling Corporation and Cystal Sugar Milling Company for sugar milling and refining; Lapanday Diversified Products Corporation, Bukidnon Highland Farms, Mt. Kitanglad Agri-Development Corporation, Dole Philippines (Davao Musatech Corporation is a subsidiary company), and Mt. Kitanglad Agri-Ventures, Inc. (MKAVI is a subsidiary of Unifrutti), Agrinanas, Nature Fresh Pineapples, and Bukidnon Highland Produce (PPDO 2008-2013).

Key informants from government pointed out that they have difficulty in regulating big corporations in water use and management because another government entity, the NWRB, has given them the rights over water.

Below are the entities that were granted water usage within the Manupali watershed:

Table 3: Water Permittees within the Manupali Watershed

PERMITTEE	Water Source	Type	Charges (Pesos)	Granted (lps)	Use of Water
1. NIA-Manupali RIS	Manupali River	SW	31,850.00	5700.000	irrigation
2. NIA	Manupali River	SW	44,500.00	8000.000	Irrigation
3. Mountain View College	Manupali River	SW	17000.00	3000.000	hydropower
4. Davao Musatech Corp.	Abo Creek	SW	940.00	80.000	irrigation
5. Davao Musatech Corp.	Tandakol Creek	SW	1,487.20	179.490	Irrigation
6. Davao Musatech Corp.	Kibalog Creek	SW	1005.70	91.950	irrigation
7. Davao Musatech Corp.	Inawilan	SW	1600.00	200.000	irrigation
8. Davao Musatech Corp.	Kulasihan River	SW	1,490.00	180.00	irrigation
9. Mt. Kitanglad Agri-Ventures Corp.	Alanib River	SW	818.60	57.930	irrigation
10. Mt. Kitanglad Agri-Ventures Corp.	Maagnao River	SW	818.60	57.930	Irrigation
11. Mt. Kitanglad Agri-Ventures Corp.	Kulasihan River	SW	1,374.50	158.160	irrigation
12. Lapanday Diversified Products Corp.	Kulasihan Creek	SW	1160.00	120.00	irrigation
13. Brgy. Bugcaon	Deep well	GW	501.76	0.640	domestic
14. VGL Incorporated	Sumaguisil River	SW	644.50	34.000	Irrigation
15. VGL Incorporated	Alanib River	SW	566.00	24.000	irrigation
16. Elias L. Diaz	Alanib River	SW	504.12	1.500	irrigation
17. LGU of Lantapan	Hagpitlan Spring	GW	839.75	61.770	domestic
18. Hilltop Lantapan Farmers	Maagnao River	SW	1,022.50	94.300	irrigation
19. Davao Musatech Corp.	Kulasihan River				irrigation

Source: NIA, 2007; NWRB, 2011

Pollution and Water Quality within the Watershed

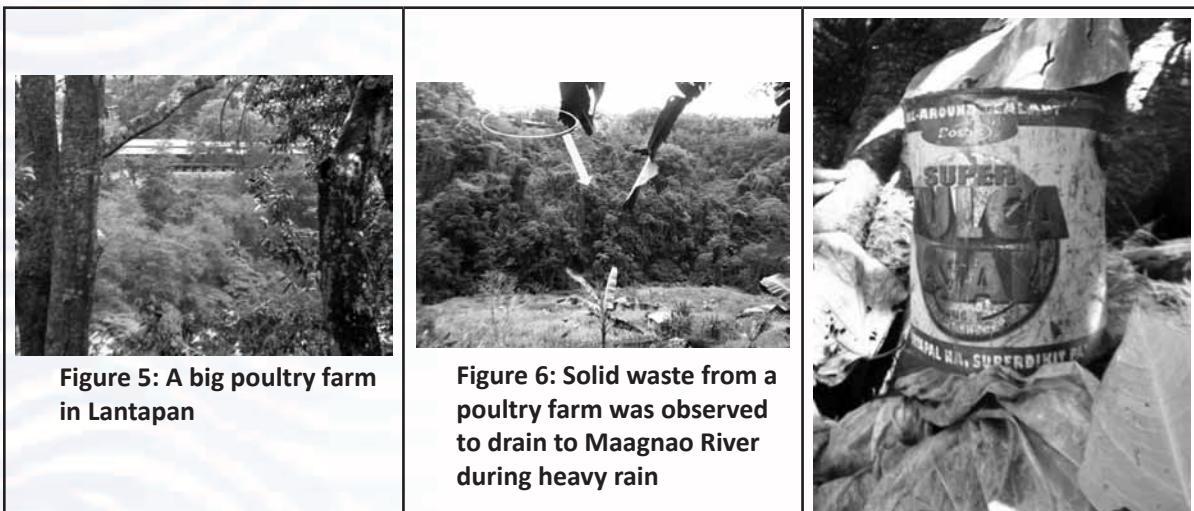




Figure 9: A banana plantation in the upland area of Talakag



Figure 9: A banana plantation in the upland area of Talakag



Figure 7: Solid waste disposals from a poultry farm near the river

The proliferation of commercial farms in Lantapan is rapidly changing the quality of aquifers and rivers. Besides the banana plantations, there are currently 11 poultry and 3 piggery businesses technically operating in the watershed. The Lantapan LGU has noted that residues from commercial chemicals and fertilizers used by plantations, as well as the dumping of wastes into rivers and waterways have polluted Maagnao River. Residents likewise complained of fly infestation in their community. One of these poultry farms (LGU withheld the name of company) is said to violate a local directive prohibiting the installation of farms within 1.5 km distance from the barangay.

The river transect in Maagnao River conducted by the community residents documented photos of solid waste disposal from the Montesclaros poultry farms that drain directly to Maagnao River (See Figure 5-7). Farmers in Lantapan noticed cases of fishkill attributed to the pervasive use of chemicals from banana plantations that drain to the river ecosystem (See Figure 8). They shared that many have left their farms because of reported chlorination of the river from the banana plantations, which they believe will harm their staple and vegetable crops.

The Socio-Economic Impact of Watershed Degradation

Notably, the provincial government has admitted that food security has been threatened by the massive conversion of prime agricultural land into bananas, pineapples and sugarcane especially in irrigated areas, putting to waste the huge investment of government in irrigation facilities. (PPDO, 2008-2013).

For instance, the intrusion of these multinational and local companies in watersheds and ancestral domains have forced the members of the Talaandig tribe to leave their farms near Maagnao River. Many of them have been cultivating corn, rice and other cash crops in hilly and sloping lands, but have faced declining harvests due to depleting water supply and deteriorating river water quality.

In the nearby municipality of Talakag, the Talaandig IP farmers interviewed noticed the decreasing quality and quantity of their abaca farms and bananas of local varieties, which they attributed to the presence of chemical-intensive banana and pineapple plantations in the area. They do not anymore feel safe in using water near these plantations for their domestic needs.

The numerous indigenous people inhabiting the Manupali watershed have continuously objected to the dominance of agribusiness corporations over their natural resources since they are the most affected by the deterioration of these resources.

A major concern of the Talaandig tribe is the protection of the hydrological resources of the upper watershed for their water supplies. The tribe attributed the current failure to protect these resources to the lack of institutional mechanisms to manage the resources in a way that explicitly recognizes their needs for more secure land tenure and alternative livelihoods (Garrity, et al., 2001). The two (2) banana plantations MKAVI and Dole Skyland Banana Corporation that operate business in the Talaandig ancestral territory in Lantapan reportedly did not comply with the Free and Prior Informed Consent (FPIC) when it withdrew water from the Maagnao/Manupali River. The Talaandig people who continuously assert their ancestral domain claim in the watershed, summoned the management of these two corporations for violating the cultural and territorial rights of the Talaandig people and for having control over the utilization of rivers that should have been for common use. They were about to cut the pipes of MKAVI from its water source but was prevented by the LGU and police. The case remains pending in the tribal council and these companies still need to face sanction based on the Talaandig's customary laws (Aban, 2009).

The local government and the DENR-PENRO have admitted that they face difficulty in regulating the expansion of these agribusiness plantations in the watersheds because the latter are operating in land classified as alienable and disposable (A&D), and owned and titled by private individuals. Plantation companies directly negotiate with landowners and secure social acceptability requirement from the barangay LGUs. DENR and LGUs said they cannot prevent landowners from leasing their lands to plantations.

Finally, the massive conversion of upland areas into plantations and the continuing timber poaching in the area were observed to have caused the devastating flashfloods in the cities of Iligan and Cagayan de Oro in December 2011 brought about by Typhoon Sendong. The LGU of Talakag and even the DENR said that there are still timber poaching operations going on in the upland barangays of Talakag, particularly in Brgy. Ticalaan and Tagbac and in the boundaries of Talakag and Lanao del Sur, which have been identified as the major cause of the disasters in these key cities in the Northern Mindanao region (See Figures 10-11).

Other Issues Downstream

Privatization of Pulangi IV Hydropower Plant

The emerging problem of farmers and indigenous peoples does not only concern the upper river basin. The lower river cluster of Pulangi also has its issues, especially the pending privatization of the Pulangi Dam IV.

Based on the outlook of the National Grid Corp. of the Philippines (NGCP), Mindanao's system capacity was 1,094 MW, with demand to peak at 1,251 MW or a supply shortfall of 157 MW. The 255-MW Pulangi IV currently has a generating capacity of only 150 MW (Sarmiento, 2012).



Figure 10: Aerial photo of the aftermath of Typhoon Sendong in Cagayan de Oro City in December 2011



Figure 11: Logs flooded Iligan City after Typhoon Sendong⁵

Already, there are talks of privatizing the Mindanao power complexes, including Pulangi IV. No less than President Benigno Aquino III is endorsing the privatization (Lacorte and Uy, 2012). The Electric Power Industry Reform Act (EPIRA), passed in 2001, exempted Mindanao NPC power plants from privatization until 2011 (Balane, Deputy Speaker Tañada: Agus-Pulangi privatization “not yet inevitable,” 2011).

In order to preempt the privatization or sale of Pulangi IV to independent power producers, the Bukidnon Power Commission (BPC) filed a resolution endorsing the privatization of the power complex, but only for Bukidnon stakeholders, through the acquisition of local electric cooperatives. BPC was created by Bukidnon Governor Alex Calingasan and composed of electric cooperatives and Bukidnon LGUs (Balane, Deputy Speaker Tañada: Agus-Pulangi privatization “not yet inevitable,” 2011).

Asserting that Bukidnon stakeholders shall be accorded the right of first refusal in the acquisition of Pulangui IV, the BPC filed a resolution to the Power Sector Assets and Liabilities Management Corporation (PSALM) supporting the “immediate privatization and endorse the acquisition of Pulangi IV by registered distribution utilities in the Province of Bukidnon.” The BPC also argued that the selling of Pulangi IV will likely attract big domestic and multinational monopolies in power generation with the prospect of bigger profits through higher power rates (Balane, Bukidnon Power Commission: “We’ll buy Pulangi IV,” 2011).

Bukidnon stakeholders argued that while the Manupali River provides water for hydroelectric power generation in Pulangi IV, the province is not a priority in terms of energy distribution from the Pulangi Reservoir. Lantapan, for instance, is sourcing power from the Maria Cristina hydropower plant in Lanao and is currently experiencing sporadic brownouts.

The Indigenous Peoples in the Kitanglad-Manupali Watershed

The indigenous peoples (IPs) belonging to the three (3) tribes Bukidnon, Higaonon and Talaandig have a unified ancestral domain claim of over 40,000 hectares of land surrounding Mt. Kitanglad, a spiritual domain of these people since time immemorial. They invoke the concept of the Native Title as their guiding principle of assertion (Aban, 2009).

The Native Title under IPRA (RA 8371, Sec. 3 [l]) is defined as “pre-conquest rights to lands and domains which, as far back as memory reaches, have been held under a claim of private ownership by ICCs/IPs, have never been public lands and are thus indisputably presumed to have been held that way since before the Spanish Conquest.” These rights (RA 8371, Sec.11), by virtue of the Native Title, shall be recognized and respected (Republic of the Philippines, 1997).

Accordingly, these tribes asserted that beneficiaries of the unified claim are all IPs in the territory covered by traditional agreements through the Tampuda hu Balagon, a known living and sacred pact performed in Tikalaan, a barangay in Talakag Municipality, long before the Philippine government was established (Aban, 2009). Talakag is a known IP territory that witnessed relevant traditional events in the history of Mindanao tribes that prove them as one of the first settlers of the island.

Farming activity is limited at the foothills of this important mountain but outside the protected area. Land resources used to be communal or owned by the tribes who live in these areas. Corn is the major crop grown, intercropped with coffee, rice, vegetables and root crops such as kamote (sweet yam) and gabi (taro). Abaca also thrives in some of the lowlands of Kitanglad, especially in Talakag area. Traditional crops are grown outside forested areas.

Traditional farming is shared both by men and women. Before and after any agricultural activity, they perform the panalabugta, a ritual to summon the spirit Apu Ibabsuk for protection of the land resource (See Figure12). One significant role of Talaandig women farmers is to prepare the pamuhat (ritual). And for the Talaandigs, women usually plant the root crop kamote, an important food

source among the tribe to obtain food security especially during drought and in times of food shortage. This practice still exists in IP areas in Lantapan and Talakag.

To identify ancestral boundaries among families and clans, the people planted bontong, a bamboo variety abundant in the area. As a communal practice, to return the favor of someone's participation during planting and harvest time, they are given shares from the total harvested crops based on their labor contribution, instead of paying them daily wage.

The tribe deeply values respect for each other, especially to the elders from whom they learn indigenous wisdom. In keeping with their basic customary principle kilalahâ or respect, they leave the river ecosystem as it is and plant root crops such as kamote only in small portions near the river for their food as well as to prevent soil erosion. Water is regarded a common good for the tribe. The Talaandigs get their drinking water from a source that flows directly from Kitanglad's forest.

IPs as Watershed Protectors

Watershed management is practiced as a way of life for the tribe. They follow the natural existence of the forest ("subay sa kinaiyahan"). A Talaandig datu (tribal leader) describes the trees as the "blanket, mat and pillow of the soil." They strongly believe that only traditional forest tree species should be planted and should not be harvested. Based on their indigenous knowledge systems and practices, they advise that only timber species that can recharge water should be planted in the watershed. They also suggest timber species that can survive in colder and warmer climate. Strong spiritual belief systems guide them in their forest conservation initiatives. They assume that the diwata (spirits of the forest) watches over the forest that provides them water and food.

Until at present, there are existing men and women cultural guards called the Kitanglad Cultural Guards (KCG) who monitor the ancestral domain and protected area of Kitanglad. At one point, they reprimanded some 'scientists' who reportedly collected forest species in this mountain without securing permission from the tribe. The 'scientists' discontinued their operation.

River Water as Commons and the Demands of IPs

A Pulangihen datu explained that the tribes of Bukidnon own the rivers of this province because this is the foundation of their cultural identity, of their beginning as people. Therefore, respect to the river ecosystem is paramount.

The Pulangihen tribe owes their identity from Pulangi River. Same with the Kulamanen and Tigwahanon tribes, among others, who coined their name after the rivers Kulaman and Tigwa, few of the important river systems in Bukidnon.

Saway (1999) and Pramono and Sukiman (2008) explained that IP culture in itself was never destructive to the environment. Deforestation, which is a cause of global warming, is the work of



Figure 12: A visual interpretation of the spirit Apu Ibabasuk who protects the earth. Soil on canvass by Talaandig soil painter Soliman Poonon.

large companies that are given the right to commercially exploit the forest through massive extraction of resources based on their capital and money. Corporations should therefore not be given the responsibility to manage forest (Pramono and Sukiman, 2008).

The diminishing forest cover in the Upper Bukidnon River Basin was blamed on the uncontrollable logging operation of logging companies during the decades 1960s up to 80s, particularly in the lower elevation of the river basin. The IPs saw how this problem exacerbated when agribusiness companies arrived in the area to convert lands into a sprawling landscape of high-value crops such as bananas, sugarcane, vegetables, and a thriving area for the livestock and cattle industry. Cases of land ownership of private businesses started by enticing IP farmers to exchange their piece of lands with sardines, miki (noodles) and mallorca (kind of wine), eventually depriving them of their ancestral land rights.

Reviving their claim of the forest by asserting the Native Title, tribal leaders emphasized that forest management should rather be integrated within indigenous self-governance in accordance with customary law. Learning from failed government reforestation projects, they said that any natural resources management program, or INREM for that matter, should undergo a free, prior and informed consent (FPIC) in which peoples' decisions are based on the principle of sovereignty of their culture and traditions and of self-determination over their territory (Aban, 2009). Under FPIC, it is the IPs who should be on top of this resource management.

Policies Governing Water, Forest and Ancestral Domain in the Philippines

The continuing degradation of the Upper Bukidnon River Basin and in particular the Manupali watershed reflects not only the lack of effective regulation on the use, development and management of the natural resources, but also, more fundamentally ,the inequitable social relations that enable big landowning families and multinational companies to own and control vast tracts of land, exploit the forests and water resources, while the numerous smallholder farmers and indigenous tribes have minimal or limited access to and control over these resources.

The policies and laws governing tenure and use of land, water and forests have barely addressed this inequity, much less empowered the indigenous communities and the local people in managing their resources in a sustainable way. Often, the policies have been crafted in a way that protects the economic and political interests of the elite, especially the big landowning families who continue to dominate Philippine politics, while in recent decades, such policies have increasingly promoted the business interests of transnational companies and their local counterpart.

Some of the policies that govern the management of natural resources in watershed include the 1976 Water Code, the NIPAs law, the Indigenous People's Rights Act and many others.

The 1976 Water Code of the Philippines mandates the State to regulate and supervise water utilization, development, exploitation and conservation. It established state ownership and control over water resources and gave it the power to allocate water rights. It allowed the private sector to enter into partnership with the State for the development, exploitation and conservation of water resources through administrative concessions. The National Water Resources Board, created in 1974, is the main government agency mandated to implement the Water Code and issue the appropriate permits to water users.

But, under the onslaught of neo-liberalism, state regulation and control over water resources has been increasingly questioned by governments and international financial institutions. In 1995, under the auspices of the Asian Development Bank, the Philippine government enacted Republic Act 8041 or the National Water Crisis Act of 1995 which provided then President Ramos one-year emergency power to enter into negotiated contracts for the financing, construction and rehabilitation of water facilities. It eventually resulted to the privatization of the Metropolitan Waterworks and Sewerage

System (MWSS). Alongside the push for decentralization, the government passed the 1991 Local Government Code which also decentralized water delivery function to local government units.

In the ensuing years, the Philippine government adopted the integrated water resource management framework or IWRM, and installed river basin offices in major river basins in the Philippines. The strategy was to focus water resource development and investments in certain geographic areas identified with huge business potential, such as mineral extraction and the generation of energy, and to increasingly involve the private sector and companies. Recent legislative proposals are focused on rationalizing the functions of the different agencies engaged in managing water resources, and on introducing wide-ranging reforms to fully adopt the IWRM elements in water policies and institutionalize water as an economic good and tradeable water rights.

In the aspect of natural resource management, the National Integrated Protected Areas System (NIPAS) Act of 1992 or Republic Act 7586 provided the legal framework for the establishment and management of protected areas in the Philippines. This Act defines protected areas as the identified portions of land and/or water set aside by reason of their unique physical and biological significance, managed to enhance biological diversity and protected against destructive human exploitation (DENR, 2000-2008). Mt. Kitanglad Range is one of the country's priority protected areas under the NIPAS law. It was proclaimed as a protected area through Presidential Proclamation No. 896 dated October 24, 1996.

On the other hand, the Indigenous Peoples Rights Act (IPRA) of 1997 or RA 8371 is a policy directive that recognizes and promotes the rights of indigenous peoples who are the primary occupants of the protected area. IPRA defines ancestral domain as referring to "all areas generally belonging to indigenous cultural communities (ICCs)/ IPs comprising lands, inland waters, coastal areas, and natural resources therein, held under a claim of ownership, occupied or possessed by ICCs/ IPs by themselves or through their ancestors, communally or individually since time immemorial, continuously to the present except when interrupted by war, force majeure or displacement by force, deceit, stealth or as a consequence of government projects or any other voluntary dealings entered into by government and private individuals/ corporations, and which are necessary to ensure their economic, social and cultural welfare. It shall include ancestral lands, forests, pastures, residential, agricultural, and other lands individually owned, whether alienable and disposable or otherwise, hunting grounds, burial grounds, worship areas, bodies of water, mineral and other natural resources, and lands which may no longer be exclusively occupied by ICCs/IPs but from which they traditionally had access to for their subsistence and traditional activities, particularly the home ranges of ICCs/IPs who are still nomadic and/or shifting cultivators."

INREM and the Prospect of Rehabilitating the Upper Bukidnon Watershed

The formulation of river basin and watershed management and investment plans, as well as increased investments in conservation and economic productivity enhancement in the forestry and agriculture sectors are the avowed major outputs of INREM. A significant contribution of the project, according to its design, will be the introduction of projects that will be packaged as payment for environment services, specifically the forest service of carbon sequestration by companies wanting to reduce their GHG emissions to community-based service providers. Revenues will be generated that will positively contribute to the maintenance of watershed functionality. Through these interventions, the project will ensure the sustainable management of the target upper river basin while improving the quality of life of the communities (ADB, 2011).

REDD and Carbon Trading

Looking beyond its goals of natural resource management and conservation and poverty reduction, the project is basically designed to introduce financially viable investments in natural resources, specifically under the mechanism of REDD (Reducing Emissions from Deforestation and

Forest Degradation), for climate change mitigation. REDD formed part of the Cancun Agreements at the UNFCCC Convention of Parties (COP-16) last December 2010. It provides the mechanism for which developing countries can contribute to mitigation actions in the forest sector through the following activities: (a) Reducing emissions from deforestation; (b) Reducing emissions from forest degradation; (c) Conservation of forest carbon stocks; (d) Sustainable management of forest; and (e) Enhancement of forest carbon stocks."

Sources of financing for REDD will come from government funds or from private companies under a carbon mitigation "offset" scheme which will enable polluters to pay for their continued emissions through a REDD project. By buying CERs from developing countries, corporations in developed nations can avoid costly emission reduction measures at home. There are two (2) types of offsets: reforestation of previously forested areas and afforestation which means planting new trees in areas where forests have not existed for over 50 years (Michael, 2009).

INREM will complement ongoing national initiatives on REDD that are focused on: (i) designing strategies and incentives to prevent further deforestation, and (ii) capacitating government offices and other stakeholders (including local communities) on applying REDD concept for effective protection and rehabilitation of natural forests and conservation of biodiversity. It has included the preparation of IP Development Plans (IPDPs) as provided in ADB's safeguard policy on IPs (ADB, 2011).

Concerns have been raised about REDD and payment for environment services on the following grounds:

1. REDD as a mechanism for carbon trading will not reduce CO₂ emissions. It will allow corporations in rich countries to continue with their emissions and thus aggravate global warming.
2. Reforestation and forest conservation are pursued not for their sustainable development value, but to create greater investment opportunities for those with capital. Carbon trading may lead to new bubbles of carbon derivatives.
3. REDD mechanisms will lead to increased corporate capture of natural resources, depriving communities of their legitimate tenurial right and control of their land, forests, water and other resources.

The UN has also recognized that REDD will undermine "hard-fought gains in forest management practices and may erode culturally rooted not-for-profit conservation values."

The emerging Green Economy concepts that treat nature as capital are already embodied in the mechanisms of REDD and payment for environment services. Nature and the functions and services it provides like carbon sequestration, stability of water cycles, micro-climate, regenerating biodiversity and soil fertility are now being packaged as "natural capital" that can be traded in international markets to attract investments and financing (Guttal, 2012).

Putting a price on natural resources and its services will mean greater control of these resources by those who have the capacity to pay, and thus worsening the existing social contradictions and resource-use conflicts that underlie the massive degradation of the world's resources. It will mean more violations of the rights of communities dependent on these natural resources. While purporting to contribute to reducing emissions, these mechanisms will actually allow heavy emitters from rich countries to continue with their pollutive industries, so long as they are allowed to pay for their emissions and even profit from these through speculation and trading.

While ADB's INREM is still in its inception stage, the private sector has already initiated reforestation projects in the Upper Bukidnon River Basin as a mechanism for carbon trading.

The Philippine tropical forests have the potential to become a source and sink of carbon. The country estimated that carbon density ranges widely from less than 5 t/ha to more than 200 t/ha in

the following order: old growth forests >secondary forest > mossy forest > mangrove forest > pine forest > tree plantation >agroforestry farm > brushlands > grasslands. The Philippine forest lands have a net sink of GHGs absorbing 107 Mt CO₂ equivalent in 1998, about equal to the total Philippine GHG emissions (DENR, 2000-2008).

The Hineleban Foundation, a foundation associated with the multinational banana corporation Unifrutti/ Mt. Kitanglad Agri-ventures Inc. (MKAVI), is into reforestation projects in the critical watersheds of Bukidnon. Its flagship initiative is the Program for Equitable Advancement of Rural Livelihoods (PEARL) which aims to reforest some 44,000 hectares of degraded areas in the six priority mountain ranges of Bukidnon and Lanao del Sur, namely: Mt. Kitanglad, Bumbaran, Kalatungan, Pantaron, Wao and Matigsalog (Hineleban Foundation, 2011).

Hineleban said that it “engages interested parties to tap CDM and emerging carbon markets to promote carbon offsetting and address climate change.” It also serves as a conduit for private investment in the key focus areas (Hineleban Foundation, 2011). By introducing CDM for the acquisition of carbon credits, Hineleban plans to reforest a minimum of 5,000 hectares in the next two to three years. It anticipates that this effort will contribute to watershed management and livelihood development of indigenous people who live within these mountain forest buffer zones and critical watersheds (Hineleban Foundation, 2011).

Clearly, reforestation that is linked to carbon trading will lead to increased control of big companies on land and natural ecosystems that are critical to the survival of poor indigenous and farming communities.

With the implementation of INREM, transnational agribusiness companies, including mining firms, will have virtual control of lands subjected to reforestation or afforestation. The irony is that these companies who are as much to be blamed for the degraded state of the targeted watersheds through their chemical-intensive and monoculture practices, as well as environmentally destructive and invasive operations, are now the partners in solving the climate crisis. This is but a clear sample of the inconsistency of REDD and its contradictions which the government and ADB are trying to promote at the expense of the already marginalized farmers/ indigenous people.

On Participation of Indigenous Communities and Other Stakeholders

The INREM project, as in past natural resource management projects of government, follows the same top-down approach which treats communities as mere subjects rather than partners in resource management. According to IP leaders like Datu Saway of the Talaandig tribe, the protected area management projects implemented in Mt. Kitanglad elicited very minimal participation from indigenous people. Government had already prepared the management zoning of the Natural Park prior to consultation with IPs. This conventional type or top-down approach of rural development defines participation as about local people working on a blueprint of what government planners wanted to happen (Pretty and Scoones, 1995). In effect, such process has undermined the ancestral domain of indigenous peoples/ communities and consequently failed to take into account the culture-based and community-oriented concept of conservation and management of natural resources (Saway, 1999).

A Talaandig datu observed that the DENR’s reforestation concept is top-down and fund-driven, which obviously contrasts the forest conservation measures among IPs that is based on their concept of survival and sustainability. Saway (1999) said that the survival of the tribe is intertwined in the ownership and utilization of land and its resources. Depriving them of these crucial elements is tantamount to depriving them of life and their total existence as people.

Provincial-level BENRO

At the early stage of planning, ADB invited the Bukidnon Environment and Natural Resources Office (BENRO), a department under the Office of the Bukidnon Provincial Governor, to a Davao and Cagayan de Oro consultation relative to watershed and environmental management. BENRO presented the initiatives of the province for the 6 watersheds (See map, figure 2).

The project implementation under INREM will be about land use planning, GIS training, commercial tree planting plus physical development that will target mainly the forest of Mt. Kitanglad and Mt. Kalatungan. The LGUs which have political jurisdiction over these mountains will be the project beneficiaries.

BENRO emphasized that INREM will have to adopt the existing watershed management plan of the province. The approach will have to be community-based in which project implementation will ensure participation at the barangay level, a strategy which they perceive will mainstream and sustain INREM with a sense of ownership at the local level. Through this approach, BENRO's role will be limited to facilitation since the communities will be hands-on in planning and implementation. It added that the budget for INREM still has to arrive from the national level, thus, they cannot commit any budget allocation yet to the target LGUs.

LGU- Lantapan

The Lantapan LGU claimed to have watershed protection intervention in previous years based on their Watershed Management Plan. It has an annual P1-Million appropriation to operate programs such as tree planting of endemic tree species.

All the target barangays will be trained for capacity building on sustainable watershed management under the ADB-INREM project. A budget of around P150,000.00 per barangay was promised for this capacity building program. Priority barangays for Lantapan Municipality are Barangays Basak, Kibangay, Victory, Songco, Cawayan, Alanib, and Kaatuan.

The LGU expects that they will formulate the training design in coordination with BENRO (province) and PENRO-DENR, while PRIMEX, as an ADB consultant, will conduct the training.

LGU-Talakag

According to its Sangguniang Bayan, the legislative body of the LGU, there was no consultation or discussion yet about INREM. There is reportedly a political rivalry between the mayor and vice mayor, thus, whenever projects are presented to the LGU through the office of the mayor, the vice mayor knows little about it.

Indigenous Communities in the Area

The IP research participants asserted that participation of the indigenous communities is essential to whatever development projects are undertaken both in the upstream and downstream river ecosystems. Tribal leaders interviewed were critical about this ADB project. They said that there was no consultation regarding INREM project or if there was, only selected datus and bais were informed. And given that Talakag is the territory of different Bukidnon tribes that have strong assertion of their ancestral land rights in the area, the tribal leaders argued that ADB and government agencies concerned fall short in conducting a thorough consultation with them about INREM.

A Pulangihen datu commented that if perhaps there was any consultation, the participants are possibly those tribal leaders who are actually not affected by the project. He explained that this usually happens when government conducts IP consultation before project implementation. He added that

while they assert FPIC as a process that government should undertake in respect of the fundamental rights of IPs, in reality, this process also has its own flaws since this can be manipulated and used against them. There were cases in the past when government undertook FPIC only among selected tribal leaders who are in favor of the project.

Given this gap, INREM project was perceived as DENR-centered and controlled. Thus, they claim that implementing INREM will violate their FPIC. A Talaandig datu expressed that at this point, they were given no more room for intervention because government and ADB have approved the plan and implementation is on its way. They have learned their lesson previously when tribal leaders were deceived and exploited by signing FPIC without substantially knowing the impact of projects in the watersheds that are also their ancestral territory. Such incidence only divided them as a tribe.

Tribal leaders and IP farmers in the area knew nothing about INREM, its emphasis on carbon trading and its implication to their ancestral domain claim. This emerging market approach to natural resources management has disturbed the tribes as the project may inroad into their ancestral domain claims. Moreover, the concept of trading runs contrary to their basic principle of resource management that is based not on profit but on maintaining harmony with nature and preserving their way of life.

Social Implications: INREM as threat to the ancestral domain claim

Bukidnon is home to more than seven (7) tribes that pay respect to Mt. Kitanglad as their sacred mountain. During the research consultation, tribal leaders emphasized that the limited recognition of government to only seven (7) tribes, making the other groups the sub-tribes of a recognized tribe, has actually brushed aside the IPs' right to self-determination and customary governance of each tribe. The act of dismissing the identity of each reveals the indifferent attitude of government during the project consultation process. Although ADB has prepared an IP Framework Plan, this does not guarantee support of the IPs for the project. In fact, some of the IPs consulted had already registered their concerns and opposition to the project.

Many have expressed their fears that the project will undermine their ancestral domain claims within the Upper Bukidnon River Basin and will deprive them of their access to these natural resources that is traditionally theirs since time immemorial.

Gender Impact

DENR-PENRO assumed that women's participation in INREM shall largely be in seedling production. They also planned to involve women participants in the project's capacity building activities, although it noted that the men are the usual key players in environment conservation/protection because the work entails physical endurance for hiking and climbing mountains that limits participation of women.

However, consultations with women IP leaders revealed some important concerns about project implementation, given that much of the forest resources and the opened spaces are now being controlled by the private business sector and such resources are already being exploited for profit. They witnessed that the transformation of forests into plantations has already undermined their local livelihoods, food security and cultural identity.

The bai (tribal women leaders) observed that as their men have become low-paid farmworkers, as a result of this transformation, they have increasingly relied on daily wages for their survival. Other IPs have sold their lands to big business and companies. But for those who still cultivate small plots of land, tending the farm has been left to the women while men work for wages. Women's domestic role has extended from their homes and children to their farm, unlike in the past when their husbands share these responsibilities. This reality shows how the multiple burden of women has even worsened under the dominance of commercial plantations.

Harvest from the farm used to be for family consumption. But as their products have been increasingly directed to the market, the income of small farmholders has become erratic. Often they received very low prices for their produce like corn, abaca and vegetables, which are not even enough to pay for their basic family expenditures because farm inputs have become very expensive. The situation is even complicated when natural disasters destroy their crops. These are major concerns of women as these impact the well-being of the family and the future of their children.

Given these serious challenges, the women feel that if the forests and agriculture resources are further subjected to private control and are commoditized and traded in the international market, the indigenous peoples in Mt. Kitanglad may eventually be displaced.

RECOMMENDATIONS FOR FUTURE ACTIONS

- ADB projects that promote privatization of water and other resources must be stopped.
- The entry of private corporations in forest and water resources under REDD Mechanism should be prevented as this will jeopardize IPs in accessing these resources that are rightfully theirs under their ancestral domain claims. Carbon trading under CDM is tantamount to selling the Philippine forest and natural resources to the international market.
- Private corporations engaged in the carbon business in the Upper Bukidnon River Basin should reduce carbon emission at source. This is appropriate and just in responding to the damaging effects of climate change. Government should compel these corporations to do so.
- Government should implement strict regulations on logging operations and penalize polluters of the watershed.
- Watershed management must start from the community, based on their concept of sustainable development. This must ensure the substantial participation of the IPs and women. Reforestation projects must not accommodate business interest, especially through engagement in carbon trading.
- Government should provide livelihood support to upland farmers who have long been marginalized by the deteriorating conditions of the watersheds and the dominance of private corporations in their areas.
- Indigenous peoples in the province should come together in collective action to prevent ADB's privatization plan of their ancestral domain.
- Privatization of the Mindanao hydropower plant through ownership of independent power producers should be stopped.

Works Cited

- Aban, Ananeza P. *Asserting our Native Title: Situation of Talaandig Indigenous Communities and their Right to Self-Determination.* documentation report, Davao: Initiatives for International Dialogue and Apo Agbibilin Council of Elders, 2009.
- ADB. "Global Environment Facility (GEF)." GEF: Global Environment Facility. Asian Development Bank (ADB). March 17, 2011. www.TheGEF.org (accessed April 10, 2012).
- Andilab, Avelino T., Jimmy L. Apostol, Aguinaldo Y. Cruz, Crisostomo A. Orque, Florentino C. Riguer, and Fernando C. Ronquillo. *River Assessment of National Irrigation Systems in Bukidnon. Assessment Report, National Irrigation Administration, Government of the Philippines, National Irrigation Adminstration*, 2007, 81.
- Balane, Walter. "Bukidnon Power Commission: "We'll buy Pulangi IV"." *Mindanews*, August 15, 2011.
- . "Deputy Speaker Tañada: Agus-Pulangi Privatization "Not Yet Inevitable"." *Mindanews*, September 11, 2011.
- Calingasan, Alex P. "Local Government Approach to Financing Watershed Protection." *Philippine Conference on Capturing Economic Benefits from Ecosystem Services*. Manila: Asian Development Bank, 2011. 22.
- DENR. *Compendium of Basic Environment and Natural Resources Statistics for Operations and Management. Statistical Report (2nd Edition)*, Department of Environment and Natural Resources, 2000-2008.
- DENR. "DENR, partners to draw national strategy to sustain conserved areas of indigenous peoples." Edited by Office of the President of the Philippines. *Official Gazette (Office of the President of the Philippines)*, March 2012.
- Duque, Sr., C M, et al. *Management of Soil Erosion Consortium: An Innovative Approach to Sustainable Land Management in the Philippines*. Management of Soil Erosion Consortium, 2001.
- Duque-Piñon, Caroline, et al. "Understanding Land Use, Water Balance and Water Rights for Rewards on Watershed Services: Experience from Manupali Watershed in Southern Philipines." *First International Conference on Sustainable Watershed Management*. Istanbul, 2011.
- Fabe, Bong D. "Carbon Stock Decreases in Bukidnon Watersheds." *Business Mirror*, May 4, 2011: B4.
- Fisher, Konrad. *Carbon Offsets & Climate Finance in India: The Corporate-Driven Climate "Solutions" of the World Bank*, Asian Development Bank & United Nations. Occasional Paper, Bangkok: Focus on the Global South, 2009.
- Garrity, et al. "Integrated Natural Resource Management on the Poverty-Protection Interface in an Asian Watershed." *Integrated Natural Resource Management Workshop*. Cali, Colombia, 2001. 14.
- GEF. "Coral Triangle Initiatives on Coral Reefs (CTI), Fisheries and Food Security." GEF- Global Environment Facility. 2010. <http://www.thegef.org/gef/CTI> (accessed April 30, 2012).
- Global Water Partnership (2000), "Integrated Water Resources Management," Global Water Partnership Technical Advisory Committee.
- Guttal, Shalmali. "New Permits to Pollute: REDD and the "Green Economy," *Focus on the Global South*, 20112.
- Hineleban Foundation. "Nurturing Ecosystems, Empowering Communities, Improving Livelihoods." Hineleban. 2011. <http://www.hineleban.org> (accessed May 18, 2012).
- KASAPI. "Philippines: KASAPI to Lead Philippine Indigenous Community Conservation Area (ICCA) Network." Edited by Indigenous Peoples Issues and Resources. *Indigenous Peoples Issues and Resources (Indigenous Peoples Issues and Resources)*, April 2012.
- La Via Campesina. "Agribusiness Transnational Corporation (TNCs) and UNFCCC Process." November 30, 2010 (accessed May 15, 2012).
- Lacorte, Germelina, and Jocelyn Uy. "Aquino Power Stand Dismays Local Leaders." *Philippine Daily Inquirer*, April 16, 2012.
- Lantapan LGU. "Municipality of Lantapan Upper Pulangui River Integrated Watershed Management Plan." Municipal Government of Lantapan, August 2002.
- Martin, Melanie J. "Carbon Pirates Threaten indigenous Peruvian Peoples, Report says." *Earthtimes*. December 01, 2011. <http://www.earthtimes.org> (accessed May 15, 2012).
- Mehedi, Hasan. "Carbon Trading and the Sundarbans: United States Interest Conflicts with Local People's Rights." *Carbon Trading, the Sundarbans and Climate Justice. Humanitywatch and Equity and Justice Working Group- Bangladesh*, March 2011.
- Michael, Wambi. "UGANDA: Carbon Trading Scheme Pushing People off their Land." IPS- Inter Press Service. September 25, 2009. <http://www.ipsnews.net> (accessed May 15, 2012).
- Mordeno, H. Marcos C. "Carbon Stocks Down 12.9% at Lantapan Watershed – Study." *Mindanews*. April 29, 2011. www.mindanews.com (accessed May 2012).
- PPDO. *Provincial Development and Physical Framework Plan. Provincial Planning and Development Office (PPDO)*, Provincial Planning and Development Office of the Province of Bukidnon, 2008-2013.
- Pramono, Tejo, and Sarwadi Sukiman. "Small Farmers Victims of Forest Carbon Trading." *Via Campesina*. December 11, 2008. <http://www.redd-monitor.org> (accessed May 2012).

Pretty, Jules N., and Ian Scoones. "Institutionalizing Adaptive Planning and Local-Level Concerns: Looking to the Future." In *Power and Participatory Development: Theory and Practice*, edited by Nici Nelson and Susan Wright, 157-169. London: Intermediate Technology Publications, 1995.

Republic of the Philippines. "Republic Act No. 8371: The Indigenous Peoples Rights Act of 1997." *Chan Robles Virtual Law Library*. Edited by The Chan Robles Group. The Chan Robles Group. October 1997. <http://www.chanrobles.com/republicactno8371.htm> (accessed April 2012).

Sarmiento, Bong. "Mindanao Electric Coops nixNPulangi IV Shutdown Until..." *Mindanews*, April 13, 2012.

Saway, Datu Migketay Victorino. "Indigenous People's Rights and Constraints in Protected Areas Management." In *Protected Area Management in Mindanao*, edited by Grace Texon, Ronet Santos, Jocel Mayordomo-Pangilinan and Ma. Anicia Manalang- Sta.Anna, 32-34. Musuan, Bukidnon: Voluntary Service Overseas and Mindanao Environment Forum, 1999.

Stehr, Hans Jurgen. "The Clean Development Mechanism- Evolving to Meet Climate and Development Challenges." In *Climate Action*, edited by Natalia Marshall and Matt Duncan, 1008-111. Sustainable Development International in partnership with the United Nations Environment Programme, 2007.

Tuddao, Vicente B. "Situation of River Basins in Mindanao." *Mindanao Economic and Environment Summit*. Davao City: Mindanao Development Authority (MinDA), 2012.

Endnotes

1 Watershed map from PENRO-Bukidnon

2 Photo by World Agroforestry Center- SANREM (Sustainable Agriculture and Natural Resources Management) CRSP

3 Data from the Office of the Bukidnon Provincial Governor

4 Data from the World Agroforestry Center

5 Photo by Bullit Marquez, Associated Press

VIETNAM

ANALYSIS OF THE IWRM APPLICATION TO ADB'S "WATER RESOURCES DEVELOPMENT IN MID AND NORTHEAST RED RIVER DELTA" (ADB 7 PROJECT)

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Executive Summary

From March to April 2012, WARECOD researchers carried out a study on the ADB project "Water Resources Development in Mid and Northeast Red River Delta," or hereafter referred to as ADB7 Project which focused on the Tri Phuong commune. Methods used to collect and analyze data are document and secondary data gathering, group discussion, in-depth interview, survey and statistical methods. Based on results of interviews with seven local officers and 41 local people, the study findings are as follows:

Key Findings

- The ADB7 Project is at the early stage of project preparation. The policies of the ADB and the proposed mechanism have not been implemented.
- Local officials are aware of some information and guidelines about the construction of Tri Phuong II pumping station project through the People's Committee meetings. The details, however, were not well-known to them.
- Communities have no direct access to project information. Up to 98% of community respondents learned about the project through different unofficial information sources.
- Officials and communities are not well aware of the Integrated Water Resources Management (IWRM) approach. This approach is still new in the Red River Delta and in Vietnam in general. The river is managed primarily by administrative boundaries such as provinces, districts and communes. Thus, information sharing is limited partly due to the administrative boundaries.
- There has been less information sharing on the management of irrigation projects including those funded by the ADB in the same river basin.

Since this study was conducted in the early stage of project preparation, ADB's policies and mechanisms have not been applied yet to the project. However, the study has uncovered issues such as lack of communication and information exchange among different stakeholders. It is expected that the research findings will contribute to the better implementation of the project. That ADB's policies will be applied properly in later stages of the project cycle. In doing so, the project will help ensure that the project will contribute in maximized and efficient irrigation system and agricultural services, as well as in better adaptation methods to the abnormal flow changes in the area. This will result in reducing poverty in the area.

Recommendations

- (i) Increase awareness raising and capacity building for the communities. Local people need to understand their rights and responsibilities in protecting and managing water resources. So, they can meaningfully participate in the project design and implementation, as well as in the operation and maintenance of irrigation systems in the local area.
- (ii) Pay more attention to capacity building for women on the issue of water resources management because women play a central role in provision, management and safeguarding water.
- (iii) Increase the participation of people as soon as ideas on the projects comes up. The local people are well aware of the local situation and should be consulted in the planning process. As community members they are the direct project beneficiaries.
- (iv) Encourage information sharing in a flexible manner between project management units in the same locality. Enhanced connectivity and information sharing between the project management units will help subprojects learn from the experience of previous projects. This will contribute to project efficiency. This is an effective way to save time and human and financial resources.

- (v) Continue to monitor the project implementation in the near future. In order to have a better and more comprehensive view about ADB7 project, it is necessary to continue monitoring its implementation in the subsequent stages of the project.

I. Introduction

I.1 Rationale

The Mid - Northeast of the Red River Delta is a long-standing agriculture area. Most of its economic outputs and employment depend on it. Irrigation infrastructure has strong impacts on production conditions and activities of rural people. In the framework of this research, it only refers to Tri Phuong II pumping station subproject in Bac Ninh province, under the "Water Resources Development in Mid and Northeast Red River Delta" or ADB7 Project.

The area has a diversified economy, where the agriculture plays a decisive role and obtains growth at 5 to 6% per year. Economic weight of agriculture accounts for about 30% of the region's economic structure. The Mid- Northeast of the Red River Delta area is of paramount importance to the socio-economic development of Northern Vietnam.

However, the unusual change of weather has a large effect to water supply and drainage in the region. Drought and flood in recent years have caused significant damages to agricultural production which directly affected the lives of poor farmers. The lack of clean water for domestic use frequently occurs in the whole basin. This seriously affects the people's quality of life since unclean water exposes them to risks of getting and spreading diseases in the area.

Therefore, it is very essential and urgent to meet water demands for both agricultural production and domestic use in the Mid- Northeast Delta. This can be done by upgrading existing irrigation systems in the area in order to maximize their efficiency. This will contribute to achieving poverty alleviation, as well as adaptation to unusual weather changes for sustainable economic development in the delta.

On March 3, 2012, the Hanoi-based State Bank of Vietnam (SBV) represented by Le Minh Hung and Country Director of ADB's Viet Nam Resident Mission Tomoyuki Kimura signed the non - refundable aid of US\$800,000 from the Japanese government for the preparation of "Water resources development in Mid – North Red river Delta" project. This project is supposed to improve irrigation infrastructure, irrigation, ensure poverty reduction in the four (4) provinces of Phu Tho and Vinh Phuc, Bac Giang and Bac Ninh (SBV, 2012).

In recent years, ADB has supported a series of water-related projects in the Red River delta. Therefore, an assessment of ADB's policies in IWRM is needed. This will promote better development and management of water, land and other resources in the delta; in order to maximize economic benefits and social welfare in an equitable way, without harming the sustainability of vital ecosystems.

WARECOD

Established in 2006 with emphasis on water conservation and development, WARECOD has extensive experience in carrying out similar researches. With regard to the irrigation and water management in the Red River delta, the WARECOD researchers decided to conduct a study on "the implementation of ADB's IWRM approach in the project "Water Resources Development in Mid - Northeast Red River Delta" (or ADB7 Project), using the Tri Phuong commune, Tien Du district, Bac Ninh province as focal point. The

WARECOD researchers hope that by examining the this ADB Technical Assistance will result in:
(1) finding good plan for irrigation development in the Red River delta in general, and in the study

site in particular; and (2) accumulating good learning experience concerning IWRM implementation in Vietnam.



Figure 1: Map of Project Sites

I.2 Objectives of the Research

- To study the application of accountability, participation, and transparency mechanisms on the ADB7 Project;
- To study the application of ADB's IWRM approach in the Red River basin; and
- To make recommendations for improved application of ADB mechanisms and policies in its funded projects.

II. Overview of the Irrigation and Drainage System

Due to limited time and resources, the Research Team chose to focus on Tri Phuong II subproject in the Bac Duong Irrigation and Drainage system. This is a subproject of the ADB7 project.

II.1 Irrigation and Drainage System in Bac Duong area – Bac Ninh province

II.1.1 Bac Duong Irrigation System

The Bac Duong Irrigation System includes the districts of Que Vo, Tien Du and Yen Phong, Bac Ninh city, Tu Son town, and 4 communes of Dong Anh district (Lien Ha, Van Ha, Loc Tu, and Thuy Lan) and a part of Ninh Hiep – Yen Thuong – Gia Lam cooperative. Bac Duong shares border lines with:

- West: Ca Lo River and Dong Anh district;
- North: Cau River;
- South: Duong River;
- East: Thai Binh River.

A total of 49,133.7 hectares (ha) of natural land in Bac Ninh belongs to this irrigation system; of which agriculture land is 25,654.8 ha (including 25,487.5 ha of annual op land and 2,322 ha of aquaculture land). The inland river system includes the Ngu Huyen Khe

river, Tao Khe canal, and Kim Doi canal (Bac Ninh Division of Water Resources – Department of Agriculture and Rural Development, 2009, p.74-75).

The irrigated zone of Bac Duong irrigation system is divided into two (2) areas:

- Area irrigated from rivers (water from Duong, Cau, Ca Lo Rivers);
- Area irrigated from river and irrigation and inland canals.

a. Assessment of Bac Duong's existing irrigation systems

The major sources of water for Bac Duong irrigation systems are from the Duong and the Cau Rivers.

- Duong River: This is the main water supply for the whole system accounting for more than 70% of the water supply. In recent years, the Duong River's water level has been very low in the dry season, causing many difficulties for the operation of pump stations, especially during land preparation time. Annually, Bac Duong Co. Ltd has to pump early and long enough to ensure timely sufficient water for farmers to crop;
- Cau River: This source provides more than 20% of water for the system.

Recently, the water level of the Cau River in the dry season tends to be higher than average.

Thus, it is more difficult to draw water from the Duong River than from the Cau River. Some far end areas, such as the end of South channel, the end of the secondary channel, or the end of the Ngu Huyen Khe River are hard to draw water from the Duong River. Currently, about 4,052 ha are in shortage of water for irrigation (*see Appendix 2*) (Bac Ninh Division of Water Resources – Department of Agriculture and Rural Development, 2009, p. 83-84).

b. Assessment of existing irrigation works

There are 286 pumping stations throughout the system including 43 irrigation pumping stations managed by Bac Duong Company. Meantime, there are 243 small local pumping stations managed by local authorities (including 165 pumping stations directly from the river and the axis river, inland canals, and 78 pumping stations of level 2). The designed capacity is for 37,591 ha, the actual irrigated area is 24,915.2 ha (of which 1,125 ha belong to Dong Anh district). Now, the system building for the Bac Duong area of Bac Ninh province is 23,790 ha (account for 85% of total area: 27,986.5 hectare). (Appendix 3) (Bac Ninh Division of Water Resources – Department of Agriculture and Rural Development, 2009, p. 83)

Water resources have been reduced. Majority of the irrigation schemes are over 30 years old. The pumps are old and over-depreciated with worn out equipments. The damaged canals are repaired and maintained every year but due to funding constraints these are mostly patchworks, which contribute to the degradation of entire system.

II. Assessment of Tri Phuong Irrigation System

The total area that needs to be irrigated and drained is 1100 ha. The drainage directs to the Duong River.

- Focal point: The Tri Phuong pumping station is in charge of this area (including 669 ha in Tien Du and 431 ha in Tu Son, with total designed flow of 25,000 m³/h.) The station was built in 1996. It has 25 machines with a capacity of 1,000 m³/h. The station is located in Tien Du district. Drainage directs to the Duong River. The current drainage capacity meets the basic requirements of 4,9l/s/ha.

- Canal: The main drainage canal has accumulated sedimentation and suffered erosion and stagnation in several sections. In February 2009, VSIP factory refilled the canal section through Phu Chan commune (near the Dai Dinh across bridge), which made it drainage ineffective.

The canal system has not been upgraded since the VSIP factory backfilled it. In fact, this pump station can only drain for 825 ha. The remaining flooded area is around 275 ha, and are concentrated in Phu Chan commune (Tu Son town), and Dai Dong commune (Tien Du district). There are about four (4) kilometers (km) of block sediment in the Huc River, which has contributed to the floods in Dai Dong commune. In addition, the Tri Phuong pumping station is an old scheme. Its equipment often malfunctions and break downs. (Bac Ninh Division of Water Resources – Department of Agriculture and Rural Development, 2009, p. 111)

II.2 Tri Phuong II Pumping Station Subproject

The Tri Phuong II pumping station subproject is part of the Bac Duong's water supply planning. This plan is based on balancing the capacity of existing main head-works, land use planning, and the current status of water supply. The plan also aims to overcome the above-mentioned problems in irrigation and drainage in the area. Specifically, it is expected that Tri Phuong II pumping station will replace Trinh Xa pumping station (a part of the South canal). Since the Tri Phuong II pumping station will be located in one province (Bac Ninh), this will make it easier for local authorities and the project proponents in preparing the construction site, dealing with compensation issues, as well as construction and maintenance in the future. The disadvantages of the Tri Phuong II pumping station include unfavorable slope, reverse irrigation, and longer irrigation canals (which can be mitigated by technologies). It is expected that after the project, irrigation and drainage demand for the 21,250 ha will be solved (Bac Ninh Division of Water Resources – Department of Agriculture and Rural Development, 2009, p. 160, 161).

III. Methodology

From March 2 to April 24, 2012, the Research Team carried out data collection and analysis as follows:

III.1 Data Collection

Desk study: The team collected project materials/documents from different channels, including Government agencies, the internet, NGO Forum on ADB, ADB Representative Office in Hanoi, etc.

Group discussion: After collecting project materials, the team discussed and selected the study site. The team also worked together to design questionnaires and finalize the necessary steps in future information collection, analysis and reporting.

In-depth interview: In-depth interviews were conducted with the leaders of Bac Ninh Department of Agriculture and Rural Development; Bac Ninh Irrigation and Drainage Project Management Unit; Branch of Bac Ninh Department of Irrigation and Drainage; and the Tien Du Office of Irrigation and Drainage. Interviewees were mostly from the Water Resources Sector at different levels.

Questionnaire: The team used a 20-question set to collect data from 47 random people/households. There were two types of questionnaires, one for local authorities, and the other for the community. The questionnaire focused on IWRM issues in the locality, the community participation in IWRM and impacts of the subproject to the locality. Of the 47 filled-out questionnaires, six (6) were from local authorities (including head of commune, cadastral person, chairman of veteran union, chairman of women union, and two (2) leaders of the two would-be-affected-by-project villages); and 41 by the community (See appendix 5 and 6).

III.2 Data Analysis

After data collection, the team processed the data on Microsoft excel and analyzed it based on ADB operational policies. The team focused on stakeholder participation (especially the community), and Integrated Water Resources Management (See Appendix 1).

IV. Research Findings

IV.1 Overview of Tri Phuong Commune

The Tri Phuong commune located in southwest of Tien Du district. The commune's total natural area is 564.95 ha of relatively flat terrain. Population stands at 8,001 people (2,012 households) distributed into four (4) villages and 14 hamlets. Luong village's population is

2,830 (701 households while Dinh village's population is 2,687 (669 households). Cao Dinh village's population is 1,839 (482 households) while Giao village's population is 645 (160 households).

Table 1 below shows the current status of land use in Tri Phuong commune. (Tri Phuong commune's People's Committee, p.1). As agriculture land accounts for a large proportion of land use, demand for water in this commune is relatively high.

Table 1: Current Land Use in Tri Phuong Commune

Order	Land use	Area (hectare)	Percentage
	Total	564.95	100%
1	Agriculture land	265.02	47%
1.1	Land for Agriculture production	241.31	43%
1.2	Land for Fishery	23.3	4%
1.3	Land for Forestry	0.41	0%
2	Non-Agriculture land	299.93	53%

The irrigation system of Tri Phuong commune inside Bac Duong system currently serves agricultural and daily household needs of four (4) villages. However, out of the 21.6 km of canals; only 8.8 km of new canal is solidified as level 3, while remaining 12.2 km has yet to be solidified. (Documents by Tri Phuong commune's authority, p. 5)

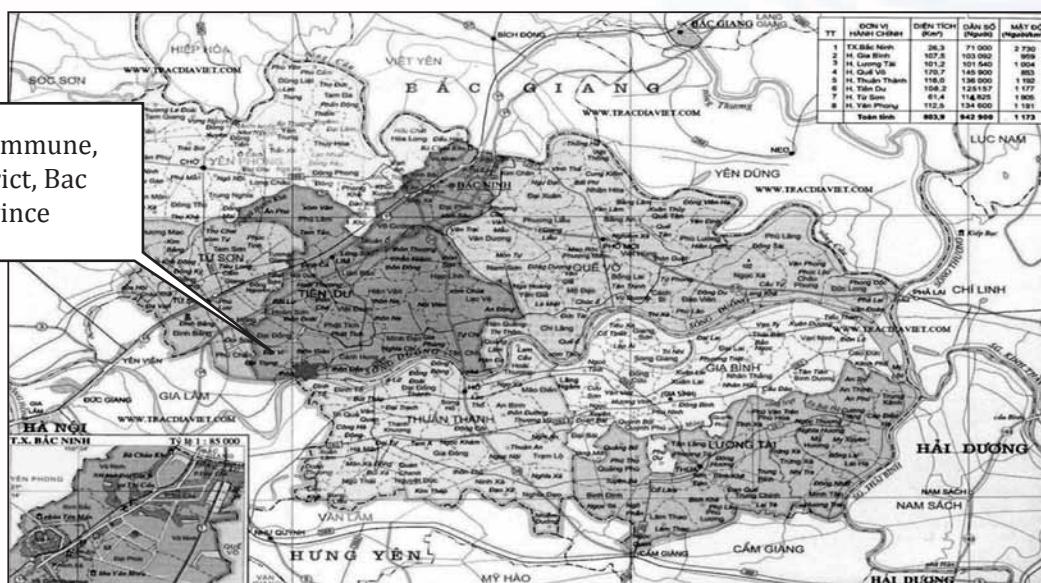


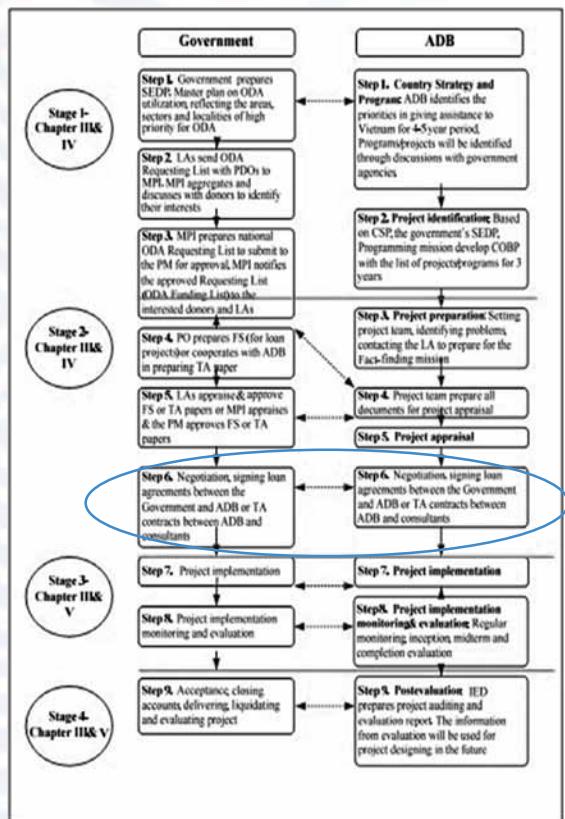
Figure 2: Map of Bac Ninh province

IV.2 Application of ADB Policies/Mechanisms in the Tri Phuong II Subproject

According to ADB's project cycle cited in the "Handbook on Processing and Implementation of ADB-financed Projects in Vietnam" published by the Ministry of Planning and Investment and Plan and ADB, the ADB7 Project has finished step 6 of stage 2 (project preparation). This pertains to the negotiation, signing loan agreements between the Government and ADB on March 14, 2012. The project is preparing for its implementation (step 7) (see Figure 3). In terms of ADB regulations, it needs to study and refer to the Safeguard policies during the preparation phase to minimize potential impacts on (i) environment, (ii) involuntary resettlement and (iii) Indigenous Peoples. After finishing the TA report, ADB will consider the feasibility of the project through fact-finding and appraise the report in terms of possible impacts of the project.

In the implementation process of ADB-financed projects, public participation is encouraged during project preparation and design (from step 7). Therefore, ADB's Safeguard policies can only be applied from step 7 onwards. As a result, the research did not analyze ADB mechanisms that apply to Tri Phuong II subproject. But the research focused on information sharing, public awareness of IWRM and local people's participation. The following sections present the results collected in WARECOD's field trip from April 13 to 14, 2012.

Figure 3: Comparing ADB's Project Cycle with the Government's ODA Project Cycle



(Source: Ministry of Planning and Investment and ADB 2009, p. 16)



Sand exploitation in Duong River



Group discussion with the local people of Tri Phuong commune

IV.2.1 Current Understanding of Local People and Authorities about the Project

The following results show the stakeholder's participation, as well as their understanding of the ADB7 sub-project based on information from two groups of interviewees (local people and local authorities) and from related documents.

Most local authorities were informed about in Tri Phuong commune in two meetings conducted by the province and district People's Committees. Nevertheless, they were only told about general information on construction works, location and beneficiaries. They did not know about other details such as funding, involving agencies, or technical documents.

When it comes to local people, 98% interviewees in three villages heard about the project through different sources. Most of them (58%) heard about the upcoming construction of Tri Phuong II pump station via rumors. They have not been officially notified about it. The remaining individuals learned about it through commune meetings or from land surveying officers, media and relatives (See Figure 4).

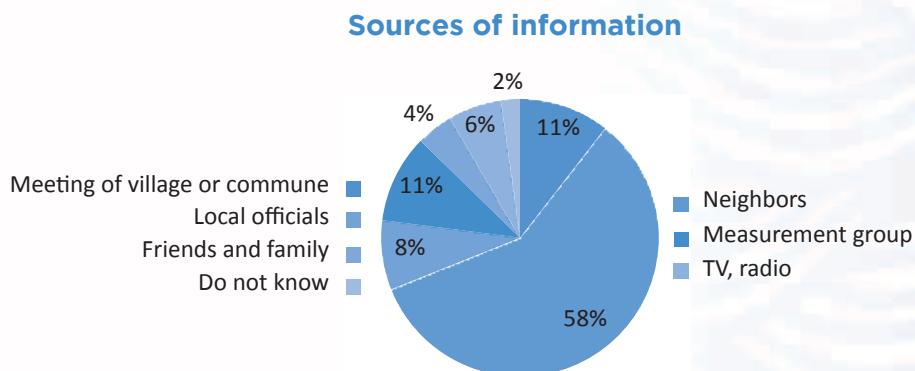


Figure4: Local People's Sources of Project Information

A lot of local people have limited information about the upcoming project. When queried, around 87.7% said the project was a new construction. But they gave vague answers related to the project works. There were up to 63% of interviewees who answered that they know nothing about the source of the project loan/capital. When asked for the time that they came to know of the project, the respondents gave inconsistent and varied answers, ranging from 2006 to 2012 (See Figure 5 and 6).

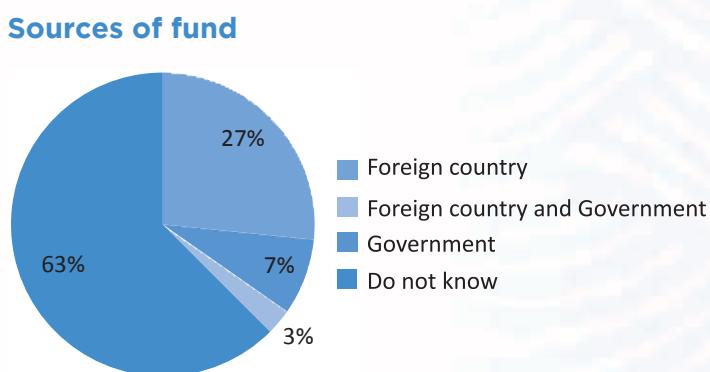
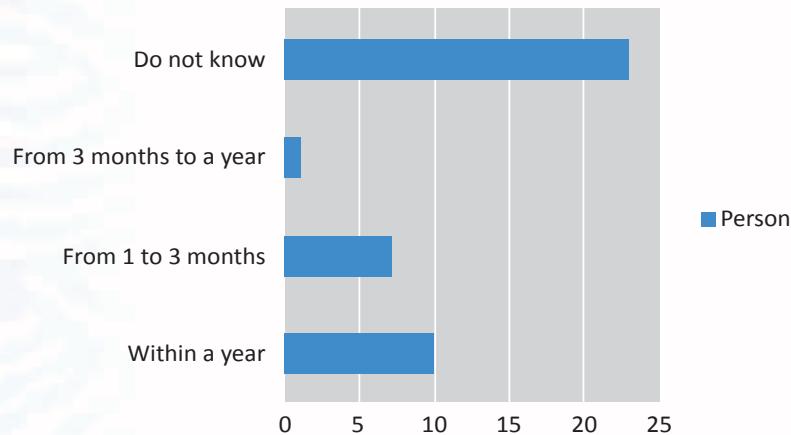


Figure5: Source of Fund

Of the 20 respondents that answered questions on possible impacts of the subproject, 85% said the subproject may affect their land, but in varying degrees and levels. Some said they will likely lose both residential and agricultural lands, and that they will have to resettle in a new area (See Table 2).

Figure6: How long have you known about the project?



All interviewed households said they very much welcome and look forward to the construction of the new pumping station. As mentioned in the overview of Tri Phuong commune, this commune often lacks water during the dry season and is flooded during the rainy season. Thus, the community hopes that the new irrigation system will help them deal with the said water problems.

Table 2: Recommendations and Understanding of Local Communities Regarding Possible Project Impacts

Content	No	Percentage (%)
1. Impacts		
- Land lost	17	41%
- No impact	3	7%
- No answer	21	51%
2. Recommendation		
- Satisfactory compensation	21	51%
- Others	20	49%
3. Complaint procedure		
- Conventional procedure	14	34%
- Unknown	2	5%
- No answer	25	61%

IV.2.2 Community Understanding of Complaint and Redress Grievance Procedure

The community told the researchers that they were ready to participate in the project and follow the state's policies. However, they really want to receive satisfactory compensation for their possible land loss. Fourteen (14) interviewees (accounting for 34%), said they would talk to local authorities from the low level (village) to higher levels

(commune, district) if they have any questions. The remaining 66% of the interviewees either did not answer the question or have no knowledge about the matter (See Table 2).

The complaint and redress grievance procedures and accountability mechanism are important issues to any project in the local area. However, this issue is not seriously considered in state-funded projects. If local people are informed about the complaint procedures, they will know where to go and to whom would they address their complaints. Thus, it will be better for them to be familiar with these procedures and mechanisms.

To conclude, ADB7 (Technical Assistance) project is still in the preparatory and designing stage. At this stage, however, local people have not been officially informed about the project. They together with local authorities have not participated in any project-related activity yet. As a result, their understanding of the project is quite limited.

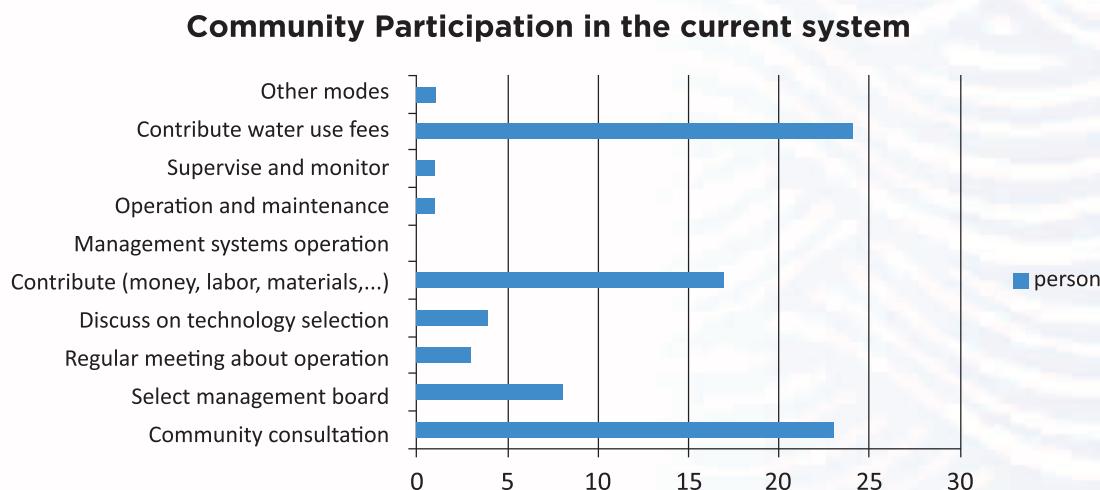
IV.3 Current Situation of IWRM at the Locality

IV.3.1 Community Participation in IWRM in Tri Phuong Commune, Tien Du District, Bac Ninh Province

In Tri Phuong, the current irrigation and drainage system was built in the 1960s. Until now, this half-century-old system is still being used despite its degraded state and its failure to meet the communities' water demands. The Trinh Xa pumping station was built to supply water for agriculture.

However, a construction factory has reduced water flow to the agricultural areas. Moreover, the Duong riverbed has been lowered due to the development and sand exploitation upstream. This has prevented proper operation of the pumping station. Located at the end of the irrigation system, Tri Phuong commune suffers water shortages in the dry season and flooding in the rainy season. As a result, the agriculture production has reduced in recent years. To deal with the situation, government agencies would usually mobilize several temporary pumping stations along the Duong River in order to provide enough water for the dry fields.

Figure7: Community Participation in the Current System



Despite community people's dependence on this old irrigation and drainage system, their knowledge on and participation in the current system are limited. A third (1/3) of the respondents were not involved in the system management (such as electing the Management Board; taking part in regular meeting about the operation of the system; and so on).

Of the 41 persons surveyed, only 33% contributed to construction and maintenance of the irrigation and drainage system in terms of money, labor and construction materials. Half the persons surveyed participated in the system in a passive manner. To be specific, they paid water use fees as requested without questioning the operation, management or maintenance of the system. As regards to being asked about their opinions/ideas, taking part in regular meetings, and electing the management board; 50% confirmed their participation. One person responded that he was one of the operators of the system. In terms of technical activities such as operation, management or monitoring, community participation was much less. In general, the survey did not acknowledge intensive participation of the community in the current irrigation and drainage system at local level (see Figure 8). Normally, they only reported to the responsible person when shortage of water or floods occurred (Figure 7).

It can be said that Tri Phuong residents have not been aware of their ownership of the system.

It is a collective asset in which they should have the right and responsibility to participate in its operation, management as well as monitoring.

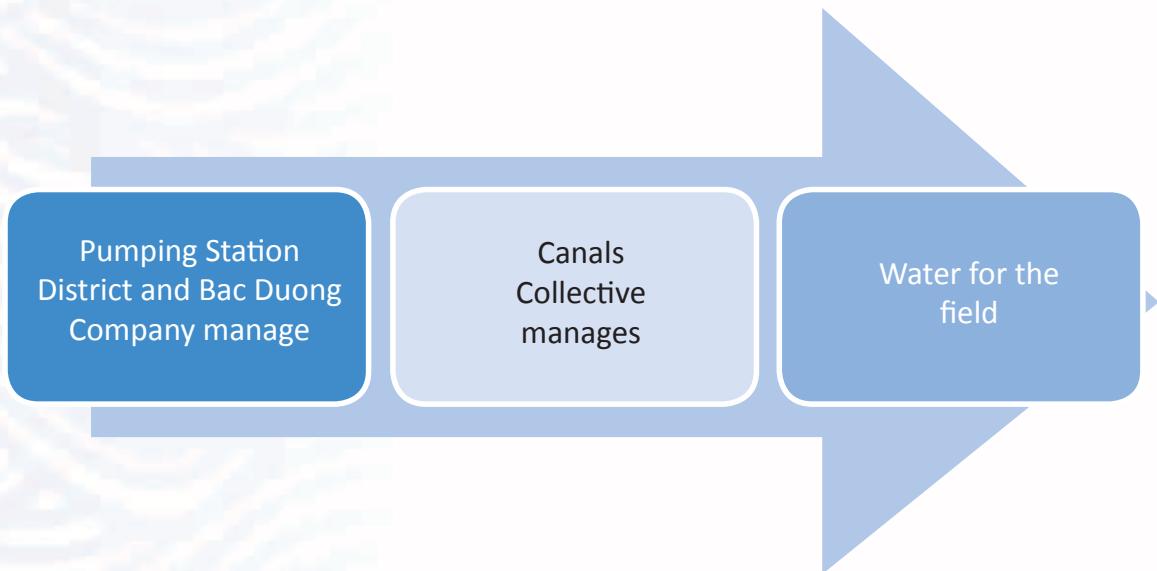


Figure8: Irrigation Management Structure in Tri Phuong

IV.3.2 Integrated Water Resources Management in ADB-funded Projects

In recent years, the Red River Delta has been the site for a number of projects related to water sector. ADB has funded many of these projects, including the "Strengthening Water Management and Irrigation Systems Rehabilitation" or ADB5 (that took effect on January 19, 2011) and "Water Resources Management in Red River Delta". The ADB5's goal is to address the insufficient human resource capacity and inadequate public infrastructure in the three (3) provinces of Bac Ninh, Hung Yen, and Hai Duong. It should be noted that Bac Ninh is a mutual site for both ADB5 and ADB7 projects. However, the more recent ADB7 project is not yet connected to ADB5. The linkage between two projects is vague.

ADB7 is a TA project which will be conducted in four (4) provinces in the Mid and Northeast of Red River Delta, namely: Bac Giang, Bac Ninh, Vinh Phuc, and Phu Tho. This project includes a number of subprojects. Its goal is to improve irrigation and drainage infrastructure in approximately 10 water resources schemes.

Located in the same river basin, an activity upstream can have permanent impacts on a location hundreds of miles away. During the interview with the Provincial Management Board under Bac Ninh Department of Agriculture and Rural Development, the Research Team did not see the linkages among subprojects at the provincial level. Even those interviewed officials were not aware of the project linkages. Specifically, a subproject in a province is conducted without concerns and connection with other subprojects in other locality even if they are in the same basin or sub-basin. Subprojects in the same river basin do not share information and experiences with each other.

IV.4 Limitations of the Research

IV.4.1 Research Conducted at the Early Stage of the Subproject

As referred above, the State Bank of Vietnam and ADB signed the Technical Assistance project on March 14, 2012. Thus, until mid-April 2012, not many activities had been implemented. It is hard at this moment to access information about this project. Even though the research team tried to collect information from multiple sources (for instance ADB office in Hanoi, Ministry of Agriculture and Rural Development, Department of Agriculture and Rural Development in Vinh Phuc and Bac Ninh provinces, Branch of Department of Agriculture and Rural Development in Tien du district, Bac Ninh province, People committee in Tri Phuong commune; websites of ADB and Management Board of Water Resources projects), the findings for this period are limited.

IV.4.2 Limited Time

The research started in March 2012. After almost two months, the Research Team collected primary and secondary data/information. They also conducted a fieldtrip to the site to conduct interviews and surveys in three potentially-affected villages. The team did not have enough time to examine ADB's other on-going projects for a comparative analysis of project implementation.

IV.4.3 Project Size

Due to time and resource constraints, the Research Team could only make one fieldtrip to Bac Ninh (among the four provinces covered by ADB7). There is a possibility that Tri Phuong subproject does not reflect the general progress or the application of ADB's policy and mechanisms. If the team had adequate time and resources, more findings and conclusions could have been drawn from the entire research.

V. Conclusion and Recommendations

V.1 Conclusion

The "Water Resources Development in Mid and Northeast Red River Delta" project is currently under preparation and design. This project is supported and approved by communities as it is expected to bring multiple benefits to them. However, at the current stage, communities have not been involved in the project, and the information about the project has not been formally conveyed to the communities. It is expected that, in the near future, ADB's Safeguard Policy Statement (SPS) will be applied in the project so that voices of community members will be heard and acknowledged by the project proponents. That these proponents can see the important role these communities play in the successful implementation of the project.

ADB has its detailed IWRM principles which ensure sustainable development for river basins. This approach is quite new to Vietnam and the people needs time to understand and follow the principles correctly. It should be a progress with multiple steps, but not a one-off action. The Research Team has shown the lack of connection among the ADB-funded projects in the Red River Delta. The team expects project planners and decision makers to pay more attention to this issue, especially to the better practice of river basin development.

V.2 Recommendations

Awareness raising and capacity building for communities: The communities need to be aware of their ownership of irrigation models/systems, especially the hardware such as pumping stations or canals. Local communities also need capacity building so that they can raise ideas/opinions, as well as learn how to operate, maintain and monitor water usage and exploitation at their locals. It is critical to understand the importance of their participation. Taking part in different stages right from the very beginning of a project means they are working for their own rights and protecting their assets; in this case, water supply for their agriculture activities. Government agencies and the ADB can pave the way for them through awareness raising and capacity building; from the lower level (i.e., electing the management board and selection of project location) to the higher level (i.e., system operation and maintenance or recommending techniques that should be applied to the project). Their active participation and strong sense of ownership will ensure that the project will last longer. This will save time and money for the government at both central and local levels.

Capacity building for women in IWRM. Women play a central role in provisioning, managing and safeguarding of water (International Conference on Water and Environment, Dublin, Ireland, January 1992). As important players, they should be equipped with adequate knowledge and skills concerning sustainable water usage for households and for agricultural purposes. This issue should be paid adequate attention from the very beginning of the project, so it will make the project more effective.

Community involvement from the beginning of the project: Local communities should be formally informed of their rights from the very beginning. They should be consulted as they have better understanding of the local situation. They are also the end-users, the beneficiaries and the centre of the project. Understanding their expectations will help project developers and planners identify the right direction for their projects. If community consultations are conducted from the onset, the direction of the project will be clearer and more focused. Project developers can collect communities' opinions through questionnaires, group meetings, and interviews (including with local officials. Whichever data gathering method they choose, the questions must be clear and easy to understand. In general, early community involvement and participation is an intelligent step towards conducting a development project.

Integrated Water Resources Management (IWRM): All TA subprojects of ADB7 are towards "Water Resources Development in Mid and Northeast Red River Delta." Located at the Red River basin, the design of these subprojects should follow the river basin approach. It is critical to share information on IWRM with stakeholders (communities, local government agencies, project developers, planners, and decision makers) so that water-related problems can be solved in a sustainable manner. In addition, information sharing within on-going subprojects at provincial and district levels will help integrate lesson learnt from previous projects. The projects in the past will be valuable sources for current and future projects. Encouraging the exchange of information in a flexible manner is important to the success of the projects. At the river basin level, it is necessary to link the ADB5 and ADB7 projects.

As a result, ADB7 will attain its goal by using fewer resources.

Continued monitoring in the future: It is essential to continue the monitoring of subprojects under ADB7 during the implementation phase. Follow-ups are vital in order to achieve a better view and sense of this entire project. When the projects are under implementation, it is expected that local communities are more involved. The application of ADB's policies on Safeguards, Information Disclosure and Accountability Mechanism will be done. Thus, in the near future, more research and monitoring work should be carried out on the implementation of (1) community participation, (2) transparency, (3) accountability, and (4) IWRM.

References

Ministry of Planning and Investment and ADB, 2009, Handbook on processing and implementation of ADB-financed projects in Vietnam, pp.74, Hanoi

The state bank of Vietnam (SBV), 14/03/2012, ADB support project "Water resources development in Mid - Northeast Red river Delta"

http://www.sbv.gov.vn/wps/portal/lut/p/c4/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gDFxN_LczdTEwN_Uw9TA09_cxPDUE9_w2B3Q_2CbEdFAGrbyl8!/?WCM_PORTLET=PC_7_0_D497F540OLL90ICIAPK2QK9U1_WCM&WCM_GLOBAL_CONTEXT=/wps/wcm/conne ct/sbv_vn/sbv_vn/vn.sbv.news/vn.sbv.news.vn/a73898804a82004d95adfd921bf89124, accessed on Mar 15th 2012

Bac Ninh Division of Water Resources – Department of Agriculture and Rural Development, 2009, Bac Ninh integrated planning report, p.74, 75, 83, 84, 85, 111, 160, 161

Tri Phuong commune's authority, 2011, New rural area construction project of Tri Phuong commune, p.1 and 5 unl Tinguy nucdavoc ng ng VitNam, Pan Nature, 2006

Integrated Water Resources Management, available at URL: http://www.archive.cap-net.org/iwrm_tutorial/mainmenu.htm, accessed on Mar 23rd, 2012

Official website of Asian Development Bank, <http://www.adb.org>

Appendix 1: The Current Irrigation Demand in Five Districts of Bac Ninh Province

Table 3: Current Irrigation Demand in the Five Districts of Bac Ninh Province (Unit: Hectare)

No.	District	Sum	Area lacking water sources	Area lacking water at the end of secondary canals
1	Yen Phong	1594	1071	523
2	Tien Du	1139	459	680
3	Tu Son	350	0	350
4	Bac Ninh	637	177	460
5	Que Vo	332	142	190
Sum		4052	1849	2203

Appendix 2: Areas Irrigated by Bac Duong System

Table 4: Areas Irrigated by Bac Duong System (Unit: Hectare)

Order	Irrigated areas	Number of constructions	Designed area	Real area
	Total	286	37,591	2,4915.2
I.1	Managed by Agro-Hydrology company	43	30,995	19,435
1	Areas irrigated from main river	18	26,796	16,495
2	Areas irrigated from river axis irrigation and inland canals	25	4,199	2,940
I.2	Managed by local agencies	165	6595.7	5,480.2
1	Areas irrigated from main river	15	1,018	1,018
2	Areas irrigated from river axis irrigation and inland canals	150	5577,7	4,462.2
I.3	Level 2 pumping station	78		

Appendix 3: Information on Interviewees

Table 5: Statistics on Survey Respondents

Content	Number	Percentage (%)
1. Number of interviewed households per village	41	100%
Giao	11	27%
Luong	13	32%
Dinh	17	41%
2. Gender	41	100%
Male	21	51%
Female	20	49%
3. Occupation	24	
Local officers	11	46%
The common people	13	54%
4. Main income	24	

Content	Number	Percentage (%)
Agriculture	19	79%
Non-agriculture	5	21%
5. Settlement		
Long-term settlement	41	100%

According to information provided by the Tri Phuong People Committee and leaders of three communes, there are about 160 households that can be affected by the project in terms of land lost (both agricultural and residential area). There are likely 40, 50 and 70 households to be affected in Giao, Luong and Dinh communes respectively. These numbers are just estimated without any official statistics. The Research Team decided to choose the sample with 41 people in these three communes, taking up 30% of total potentially-affected households. The proportion of male and female was 50/50, ensuring the gender balance in this study.

Appendix 4: Questionnaire Survey and Assessment of Project (for Communities)

TA: “Water Resources Development in Mid and Northeast Red River Delta”

Locality (village/ commune/ district/ province)	
Time (date/ month/ year)	
Interviewer	

Name of interviewees (not required):

Gender: Year of Birth: Ethnic: Education (level/ class):

Number of household members:

The main income-generated activities of your family:

- | | |
|---|--|
| <input type="checkbox"/> Agriculture
(Area: rice, corn....., vegetables....., fruit trees....., irrigated area:.....%) | <input type="checkbox"/> Non agriculture
Your family:
<input type="checkbox"/> Settled there
<input type="checkbox"/> New transfer from other areas (since:.....) |
|---|--|

I. General information on project

1. Do you know about any projects on irrigation in your commune?
If no, Please answer questions of part V. **Institute Water Resources Management (IWRM)**
If yes, Please answer the following question:
Do you know which source this project gets funding from?
Before this project, did your commune have any projects on irrigation and drainage? (if yes, please tell more about that project)
2. How did you know about this project? And what information did you get?
 Meeting of village or commune Friends and family
 Local officials TV, radio
 Neighbors Other (please specify)
3. Do you know what items are included under this project?
 New construction Dredging
 Repair Other (please specify)
 Upgrade
4. What location is the project conducted?

II. Participation

5. Do you know what officials related to this project?
- Propose the project: - Receive and deploy the project (Contractors):
- Approve and evaluate project: - Assess the project:
6. Before the project is implemented, did the official had consulted about the project?
Methods of consultations:
 In-depth interviews A letter of medical contributions
 Group meeting Other methods
 Questionnaire
7. If yes, which organization holds consultation?
8. Upon the requests, did you raise any suggestions in the consolation? If yes, what were the suggestions?

III. Transparency

9. Did they acknowledge your comments, summarize and give them back to you?
10. Before implementation of project, did management boards or local authorities informed you about project?
11. Methods of inform:
 Group meeting Radio, TV
 Announced paper in local authority office Other methods
 Panels, posters, banners

12. Did they inform you about your rights, your responsibilities on project? If yes, what are they?
13. Do you know what office is responsible to answer your question about this project?

Have you sent any questions to them?

If yes, did they answer your question soon and clearly?

IV. Accountability

14. After you knew about this project, what are impact of project with environmental, livelihood, and land use, in your opinion?
15. Did you know about the complaint activities?
 - Subject of complaint:
 - Who can complain:
 - Office of inquiry:
 - Office received your complaint:
 - Order of complaint:

V. Institute Water Resources Management

16. What are water sources your family often uses for agriculture?
 - Canals
 - Ponds, lakes
 - Stream, rivers
17. Are you satisfied with the current irrigation and drainage system?
18. What are constraints of current systems? How did you do to solve them?
19. In current irrigation systems, you or members of your family participate in:
 - Community consultation to build current systems
 - Select management board of current systems
 - Take part in regular meeting about operation of the system
 - Discuss and comment on technology selection, equipment for irrigation
 - Contribute (money, labor, materials,...) to build current systems
 - Management systems operation
 - Operation and maintenance management model and use water
 - Supervise and monitor construction, operation and maintenance model
 - Contribute water use fees and participate in relevant meetings periodically
 - Other modes (please specify)
20. If there is a project to upgrade, repair current irrigation systems, what are the benefits and difficulties, from your point of view?

Appendix 5: Questionnaire Survey and Assessment of Project (for Local Officials)

TA: “Water Resources Development in Mid and Northeast Red River Delta”

Office	
Time (date/ month/ year)	
Interviewer	
Interviewees (name/ position)	

I. General information on project

1. Do you know about any projects related to irrigation in your commune?

If no, Please answer questions of part V. Institute Water Resources

Management

If yes, Please answer the following question:

Do you know which this project gets funding from?

Before this project, did your commune have any projects related to irrigation? (if yes, please tell more about that project)

2. How did you know about this project? And what information did you get?

- | | |
|--|---|
| <input type="checkbox"/> Meeting of village or commune | <input type="checkbox"/> TV, radio |
| <input type="checkbox"/> Local officials | <input type="checkbox"/> Official decision (via text) |
| <input type="checkbox"/> Neighbors | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> Friends and family | |

3. What items does the project include?

- | | |
|---|---|
| <input type="checkbox"/> New construction | <input type="checkbox"/> Dredging |
| <input type="checkbox"/> Repair | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> Upgrade | |

4. What location is the project conducted?

II. Participation

5. Do you know what officials related to this project?

- Create proposals for the project:
- Approval and evaluation of project:
- Receive and deploy the project (Contractors):
- Assess the project:

6. Before the proposed project, did the official consult stakeholders? Consultation methods:

<input type="checkbox"/> In-depth interviews	<input type="checkbox"/> A letter of medical contributions
<input type="checkbox"/> Group meeting	<input type="checkbox"/> Other methods
<input type="checkbox"/> Questionnaire	
7. If yes, which organization holds the consultation?
8. Did the stakeholders raise any suggestions? If yes, what were the suggestions?

III. Transparency

9. Did organization acknowledge their comments, summarize and give back to stakeholders?
10. Before implementation of project, did management board or local authorities inform stakeholders about project?
11. Method of giving information:

<input type="checkbox"/> Group meeting	<input type="checkbox"/> Radio, TV
<input type="checkbox"/> Announced paper in local authority office	<input type="checkbox"/> Other forms
<input type="checkbox"/> Panels, posters, banners	
12. Were stakeholders kept informed about their rights, responsibilities on project? If yes, what were they?
13. Do you know what office is responsible to answer stakeholders' questions about this project?
Have anyone you send question to that office?
If yes, did the office answer stakeholders' question soon and clear?

IV. Accountability

14. Did you know about the complaint?
 - Subject of complaint:
 - Who can complain:
 - Office of inquiry:
 - Office received your complaint:
 - Order of complaint:

V. Institute Water Resources Management

15. What are current irrigation systems in this area?
16. Please clarify about mechanism of water resources management for agriculture (structure, organization structure model, including parties, functions and duties of parties rules, principles, and comfortable operation agreement, the institutions of the community mechanism, selection regulations and monitoring management apparatus,...)
17. Please clarify about mechanism of operating water resources model for agriculture (technology, equipment and materials, building and operating, technical operation capabilities, maintenance and monitoring, schedule operation and monitoring, schedules and forms of community participation in the operation, ability of the model,...)

18. Financial activities:

Category and overall investment costs:

Who pay for the items of the project/system?

Revenues (taxes, fees and contribution periodically) and recurring costs:

Economic efficiency (cost – benefit assessment)

19. The social impacts:

The problem of water management and used that model will solve in future:

Community capacity related to operating and maintaining the model (increase/decrease of improvement in certain aspects):

The level of support/ assistance of local government; the cooperation with stakeholders:

The level of support, attitudes and participation of community, the community's opinions on ownership, the right in decision-making process, the management and supervision of community, the benefits of community,...)

Or potential conflicts occurred between the stakeholders of the project (especially between affected people and beneficiaries)

20. Environmental/ecological impacts:

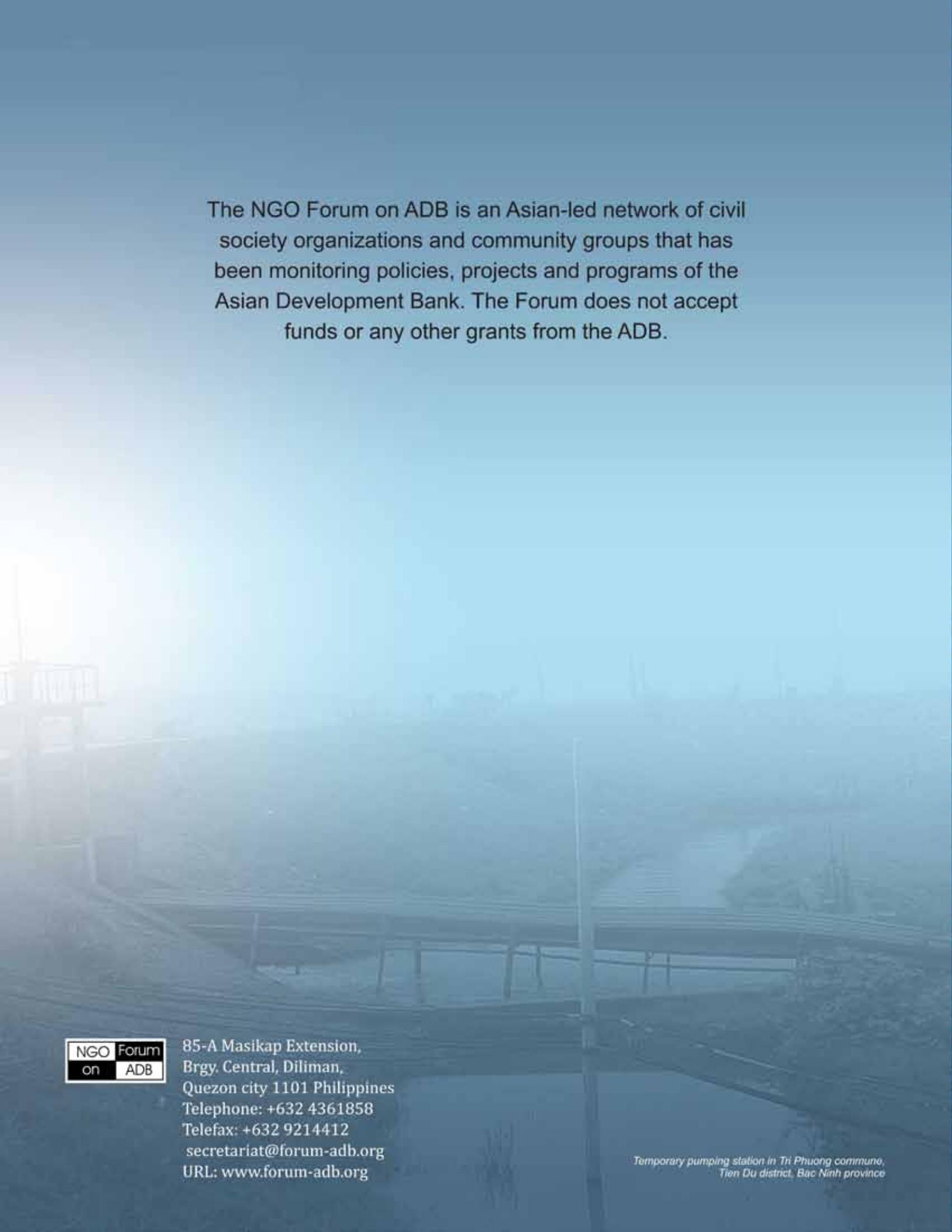
Changes in quantity and water quality predictions?

Expected impact on land?

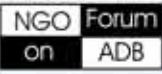
Expected impact on plants, crops and livestock?

Predicted impacts on natural habitats and local wildlife observed, the general assessment?

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