



Republic of Indonesia

**WATER RESOURCES MANAGEMENT
TOWARDS ENHANCEMENT OF EFFECTIVE
WATER GOVERNANCE
IN INDONESIA**

*For the 3rd World Water Forum
Kyoto – Japan, March 2003*

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1 Foreword

The World Water Vision of 2000 opened with statement “Water is life, in all forms and shapes”. This simple statement reflects the crucial importance of water for all our citizens, but also for social, economic and cultural life. Our new Indonesian Water Law is also based on this simple but essential understanding of the role of water in our society: “Water resources represent a gift from God as a main element for life and the way of living of the people. Water should be used for the utmost welfare of the people in a fair way. Therefore everyone has the right to get water for fulfilling the daily basic needs.”

Indonesia is still striving to emerge from a severe economic crisis and at the same time the country is in process of transition to a decentralized and democratic society. Reform of the Water Sector is one of the important actions in this national reform process, because of the vital role of water in developing the country, fighting poverty, safeguarding the food production and conserving our natural resources.

Indonesia very much welcomes and supports the initiatives of World Water Council to give follow up to the second World Water Forum in the Netherlands in 2000 and to prepare the third Forum Japan in 2003. As concluded by the Ministerial Conference in The Hague in 2000 not only Indonesia, but also the whole world is facing major challenges in our future approach to water resources. A joint approach to meeting these challenges is needed, both on an international and on a national scale.

The Water Reform in Indonesia is well underway. The framework for action has been created. Now the time has come to put our words into actions and to actually share our water resources in an equitable and democratic way.

This Country Report describes the actions that have been taken or are being implemented by Indonesia to meet the challenges of managing our water resources. The report is meant to contribute to the discussions at the 3rd World Water Forum, but should at the same time serve as a basic document for the further discussion on the management of water resources by all the “water partners” in Indonesia.

2 Follow Up Actions to the Second World Water Forum

2.1 The Global Water Concern.

The global awareness on water was starting to be the worldwide concern at the occasion of the First World Water Forum in Marrakech, Morocco in 1997, which was initiated by the World Water Council. This forum resulted in a mutual consensus on the preparation of the world vision on water, life and environment in the 21st Century to be presented during the second world water forum.

The Second World Water Forum has then given opportunity for all to participate in determining the future direction on the efforts for sustaining the water for all – therefore all segments of the world community can get access to adequate water, protection and conservation of water for human life on earth.

2.2 The World Water Vision

The world vision on water was unanimously agreed upon at the Second World Water Forum in The Hague, toward a sustainable future of water, which is: *"Making Water Everybody's Business"*. The fact that the underlying "world water crisis" is not merely associated with the severe scarcity of water to meet the human needs, rather, the crisis is mostly due to the inability to manage this distinct natural resource. The problem on water crisis would become more and more critical as they are viewed in more complicated interactions amongst the complex system. The concern as well as the awareness about the present status of water was, ever since addressed by all in terms of "Think globally and act locally".

2.3 Regional Concerns on Water

Following the global concerns, the formulation of Regional Water Vision and Framework for Action of the Southeast Asian Region was coordinated through the "Southeast Asia Technical Advisory Committee - SEATAC" of the Global Water Partnership - GWP, involving Brunei Darussalam, Cambodia, Indonesia, P.D.R. of Lao, Myanmar, The Philippines, Singapore, Thailand and Vietnam representing countries and stakeholders in this region.

2.4 Water Vision of the Southeast Asian Region

The water vision and framework for action of the Southeast Asia Region is:

"The attainment of sustainability of water resources to ensure sufficient water quantity of acceptable quality to meet the needs of the people of Southeast Asia in terms of health, food security, economy, and environment."

This water vision is intended to delineate the improvement of water resources development, management and conservation -- including the related strategy for actions to achieve the vision -- of the Southeast Asian Region in the long-term perspective towards the year 2025.

Each country under the regional coordination, including Indonesia, has formulated its own vision and Framework for Action. The formulation of which was conducted with continuous consultation and consistency with the general consensus that had been set up for the region.

In the formulation of each individual country's water vision and framework for action, all the specific nature of the water related management and utilization are discussed, formulated and agreed upon by the community members.

2.5 Indonesia, From Vision to Commitment for Action

Forum for Stakeholder Participation

In line with the objectives of the series of global forums and discussions that have been conducted so far, Indonesia has also conducted a national water forum referred to as: *"Forum Air Indonesia - 2000 (FAI-2000)"* or The Indonesian Water Forum, 2000. The FAI-2000 aimed as the unprecedented national forum on water to facilitate opportunity for all water-concerned parties to mutually participate for formulating the way forwards for attainment of sustainability of water for the whole people of Indonesia.

As the discussion material for formulating the Framework for Action toward sustainable water management in Indonesia, a preliminary draft was prepared entitled "Water for the 21st Century: From Vision to Action - Indonesia". Based on this, the "Declaration of Indonesian Water Forum - 2000" was formulated as the basis for articulating the Indonesian Vision and its Framework for Action as well as the follow-up commitments.

The Indonesian Water Vision

The Indonesian Water Vision, which was formulated in the FAI-2002, is:

"Actualisation of stable water utilization in efficient, effective and sustainable manners for the prosperity of the whole people"

This vision contains several definitions on provision of water for various purposes as follows:

- Opportunity to have stable water supplies (sufficient, accessible, safe and healthy water supply) for all the needs of human living spiritually as well as physically and for the environment;
- Sufficient water supply to meet all of the water demands for sustainability of food security and availability for the entire communities and the people of Indonesia;
- Sufficient water supply to ensure the sustainable support for economic activities and sustainability of economic development for the entire Indonesian territory;
- Protection and conservation of land and water environment, protection of biodiversity and cultural inheritance as well as mitigation of the water induced natural disasters;
- Opportunity to get access to the water available through variety of efforts including the provision, protection, conservation and security for attainment of prosperity of the people within the entire Indonesian territory.

In general, the Indonesian Water Vision aims to encourage all water stakeholders to form and to build mutual consensus on the state of water as well as mutual efforts to manage the water resources toward the year 2025.

Establishment of Indonesian Water Partnership

As a follow up of the Second World Water Forum, the *Forum Air Indonesia 2000/FAI 2000* (Indonesian Water Forum 2000) was conducted in November 22 to 23, 2000. The forum, which will be held every other year, is intended to be a forum for discussion, exchange of information, and formulation of problem solving alternatives to water resources. This forum involves all kind of stakeholders in water resources sector, including Water User Associations (WUAs), water user communities, NGOs, professional organizations, academia, private sectors, government institutions as well as member of parliaments in promoting *Integrated Water Resources Management (IWRM)*.

In order to be able to accommodate the activities of the Forum, The *Kemitraan Air Indonesia – KAI* or The Indonesian Water Partnership was established in March 22, 2002 on the occasion of The 2nd Indonesian Water Forum to celebrate the World Water Day - 2002. The establishment of the Indonesian Water Partnership is also intended to facilitate optimum networking with international water institutions such as the Global Water Partnership (GWP). The GWP is committed to complete its Framework for Action and help develop Regional and National Programmes of Action to ensure the fulfilment of local needs.

Further to the above objectives, the Indonesian Water Partnership also aims to establish synergy and cooperation for realizing the benefits of sustaining water for human welfare through the “*Integrated Water Resources Management*” approach. In pursuing its objectives, the Indonesian Water Partnership (KAI) has set up the following programs:

- To open web-site as a mean for disseminating information on water resources such that every body has an access;
- To receive and disseminate information on water resources at the national, regional or international levels, as well as with other *Country’s Water Partnerships*;
- To be part of the regional as well as global networking institutions for promoting *Integrated Water Resources Management*.
- To encourage and facilitate each member to participate in such a way that they are able to give inputs concerning the issues which are being addressed -- in an open manner – with the support of other community members;
- To coordinate and synchronize members activities to be more collaborative and to avoid overlapping of activities among members.

Effective Water Governance

The current water crisis is not about having too little water to satisfy our needs, but rather a crisis of water governance. The Ministerial Declaration of The Hague on Water Security in the 21st Century, has therefore identified the following main challenges to achieve water security: *Meeting Basic Needs, Securing the Food Supply, Protecting Ecosystems, Sharing Water Resources, Managing Risks, Valuing Water, and Governing Water Wisely*. The government of each signatory country has agreed to “*advance the process of collaboration in order to turn agreed principles into action based on partnership and synergies among the government agencies, citizens and other stakeholders.*”

In response to and according to the principles of the foregoing, Indonesian Water Partnership (IWP) with technical guidance and financial support from GWP-SEATAC and other internal donors organized the first National Dialogue on Water Governance in Indonesia, 1st August 2002.

Considering the underlying process of water resources policy reform, in which the basic principles of water resources management and development, institutional structures and system financing are being formulated to serve as more effective platform for sustainable water governance, the National Dialogue was convened to address the following issues:

- To generate a common understanding and perception on key elements of water governance among water resources stakeholders, especially on IWRM, institutional reformation on a broader basis, and water resources financing system particularly for water resources public corporations; and
- To identify governance issues that should be addressed in the forthcoming national dialogues.

One of many important results of the dialogue on Effective Water Governance are observations and suggestions as follows: a) river as *a common pool resources* (complex intermingled resources) should be managed based on polycentric governance approach, i.e., acknowledge that society order consist, of many arenas or show-grounds that their existence overlaps in a certain system, but they are self

governing and responsible on their own activities; and b) *Polycentric governance* is a necessary condition to make IWRM operational, but this is not enough. Some conditions are required to enable polycentric governance to contribute positively to effective water governance, such as: (i) policy and regulatory frameworks that acknowledge and support the growth of centres that represent complex stakeholders' interests and aspects of water resources management; (ii) develop a framework of management with polycentric governance approach that could avoid chaotic condition, and (iii) capacity building for institution and human resources.

2.6 Dialogue on Water, Food and Environment

Concerning the Water, Food and Environment, the dialogue has grown out new interest in water framework for Action, given the facts that there is yet insufficient interaction between the agricultural and environmental sectors. The widely diverging views on the need to develop additional water resources for agriculture and the benefit and costs resulting from such development has led to an intense, sometime resentful debate and delays in much-needed investment.

In an attempt to facilitate further measures to alternative resolutions of the problems, ten of primary actors in the field of agricultural water management, environmental conservation and health, i.e., FAO, IFAP, GWP, ICID, IUCN, IWMI, UNEP, WHO, WWC and WWF have joined forces to promote a rational dialogue on future water needs for nature and food production, especially in developing countries. These organizations have formed a Consortium to help pursuing the Dialogue as an international program. The goal is to improve water resources management by bridging the gap between food production of agricultural sector and environmental sectors through open and transparent dialogues and sharing knowledge as well as experiences.

With regards to the urgent needs for benefiting the dialogue, the Indonesian Water Partnership (IWP) has proposed the following activities to the Dialogue Secretariat for further consideration:

- Preparatory Phase (at national level): understanding concepts and processes, conceptual plan; preparation of proposal; establishment of small coordinating unit; and training of trainers.
- Implementation Phase (at national, provincial, and river basin levels): identification of stakeholders to be involved; identification of problems and agendas; series of workshops; achieved consensus and commitments.
- Plan for Follow-up Actions Phase (at national, provincial and river basins levels): institutionalised in the form of adopted policies, laws and regulations of the dialogue results, establishment of performance indicators and monitoring processes.

The Dialogue Secretariat is compiling proposals from the potential convenes of the Dialogue from country partnerships across regions or international organization with their partners. This compilation will lead to a blueprint of the work plan of the Dialogue in the coming years. This blueprint will be further refined and presented at the 3rd World Water Forum. The end date for the Dialogue process would be at the 4th World Water Forum in Montreal, on March 2006.

2.7 Relevance of The 3rd World Water Forum

The Forum will invite participants to share their experiences with proven ACTIONS and best practices-supported by sound research, science, and theory -- that have

facilitated sustainable solutions to water problems. A priority will be to promote dialogue and interaction among numerous stakeholders for integrating knowledge and experience gained thus far.

The 3rd World Water Forum consists of three fundamental elements: the Forum, Ministerial Conference and Water Fair & Festival. At the Forum, sessions will be held on major themes, controversial topics, special programs and major groups. Sessions intend to encourage the sharing of experiences with actions that have proven successful and to motivate commitment for immediate actions.

The Government of Japan will organize an international conference at a ministerial level on the occasion of the 3rd World Water Forum, in which ministers and the heads of international organizations will take part. The primary objective of the Ministerial Conference is to reaffirm political will towards solving water issues and to add a political perspective to the efforts of the Forum participants and the general public around the world. The Ministerial Conference will identify concrete actions taken by governments that have the primary responsibility for water management.

Two kinds of outcomes are expected at the Ministerial Conference. One is a ministerial declaration, in which attending ministers summarize the conclusion of the discussion and adopt the points of common understanding in the form of the Ministerial Declaration. This would include follow-ups measures including assessment of previous international conference especially the World Summit on Sustainable Development (WSSD) in Johannesburg 2002. The other expected outcome is a compilation of action plans submitted voluntarily by each government or international organization either individually or collectively with its partners, which will be called as a portfolio of water actions.

2.8 Process of Preparing Country Report

Plan of Implementation of WSSD 2002

At the 2nd World Water Forum held in 2000, the “World Water Vision” was developed to raise awareness for water issues in the 21st Century and the “Ministerial Declaration of the Hague” that specified seven main challenges in water sector to be addressed was adopted. As follow up developments, proposals to establish concrete goals for actions in the water sector were formulated during the UN Millennium Summit and the International Conference on Freshwater. More concrete goals and steps for actions were then prepared. These include “Plan of Implementation” and “Partnership Initiatives” during the most recent World Summit for Sustainable Development 2002 in Johannesburg.

“Plan of Implementation” that clarifies future action for furthering the implementation of Agenda 21 on Water Sector consists of:

- Safe drinking water and sanitation (Para 7, 24);
- Protecting ecosystems and natural resources management (Para 23);
- Integrated Water Resources Management, IWRM (Para 25);
- Monitoring and assessment of the quantity and quality of water resources (Para 26);
- Scientific understanding of the water cycle (Para 27);
- Coordination among various international/intergovernmental bodies (Para 28);
- Risk management, and disaster management (Para 35); and
- Food production, food security and water resources management (Para 38).

However, the specific actions from each country, including Indonesia may still need further clarification.

“Partnership Initiatives” that consist of the following possible action, i.e., stakeholder involvement, sector-wide approach, development assistance, and international networking is a good approach to clarify specific steps toward taking initiative. In order to promote actions by various national governments and international organizations in water sector, voluntary action plans that take into account the primary role and independence of various national governments and international organizations are indispensable.

Portfolio of Water Actions

Voluntary action plans aims to contribute to further actions for the achievement of targets set by Agenda 21 and UN Millennium Development Goals for measures toward the resolution of water issues in the spirit of “Ownership and Partnership” of the Ministerial Conference, by having various governments and international organizations take initiative in declaring specific action plans in the water sector.

The documents submitted by governments and international organizations will be compiled as the “Portfolio of Water Actions” (PWAs). The PWAs is expected to contribute to the creation of political momentum leading to steady implementation and to the establishment of new avenues for coordination among implementing bodies by having countries and international organizations reaffirm future actions to be undertaken, take initiatives to create action plans and bring these together and announce them in PWAs. For Indonesia, PWAs is also a media to propose a debt swap scheme for natural resource and poverty alleviation and also partnership scheme by NGO, i.e., Indonesian Water Partnership to Indonesian development partners.

Water is a resource with strongly regional characteristics and water issues contain many problems that are crosscutting across various specific fields. Therefore, action toward the resolution for water will require systematic coordination among various sectors and will need to be actively linked to the plans, initiatives and proposals of various regions.

To address and compose Country Report and Indonesian Blueprint for Action, several inter-sectoral meetings and culminated by a water resource stakeholders workshop organized by the Ministry of Settlement and Regional Infrastructures and the *Bappenas* (Indonesian National Development Planning Agency) were conducted.

3 Water Resources in Indonesia

3.1 Background

Despite of the abundance of water resources potential, the Indonesia’s surface water resources have already experienced water shortage during the dry season. The total water demand of the country is currently 1,074 m³/sec for irrigation, domestic, municipal and industrial purposes, while the low flow available at the normal climatic year is only about 790 m³/sec. This explains that the current water uses is highly

constrained by unbalanced condition of demands and the potential availability of water, particularly at point of time during the season of scarcity of the year.

Indonesia's population of 207,6 million (2000) is spread over a number of islands. The increasing population in Indonesia is not followed by the equal distribution of population regionally either by province or by island. According to 2000 Population Census, Java Island resided by around 59% of population, which has area of 7% to total area of Indonesia. Meanwhile, Maluku and Papua have 25% of the total area of Indonesia but are inhabited by 2% total Indonesian population. With the current growth rate of 1.66% the population is expected to grow to 280 million by the year 2020. In the past decade urban immigration has resulted in an urban growth of about 5% annually. It is estimated, therefore that by the year 2020 about 52% of the nation's population will live in urban surroundings, compared to 38% in 1995. The key statistics related to population, irrigated agriculture and rice production are presented in Figure 1.

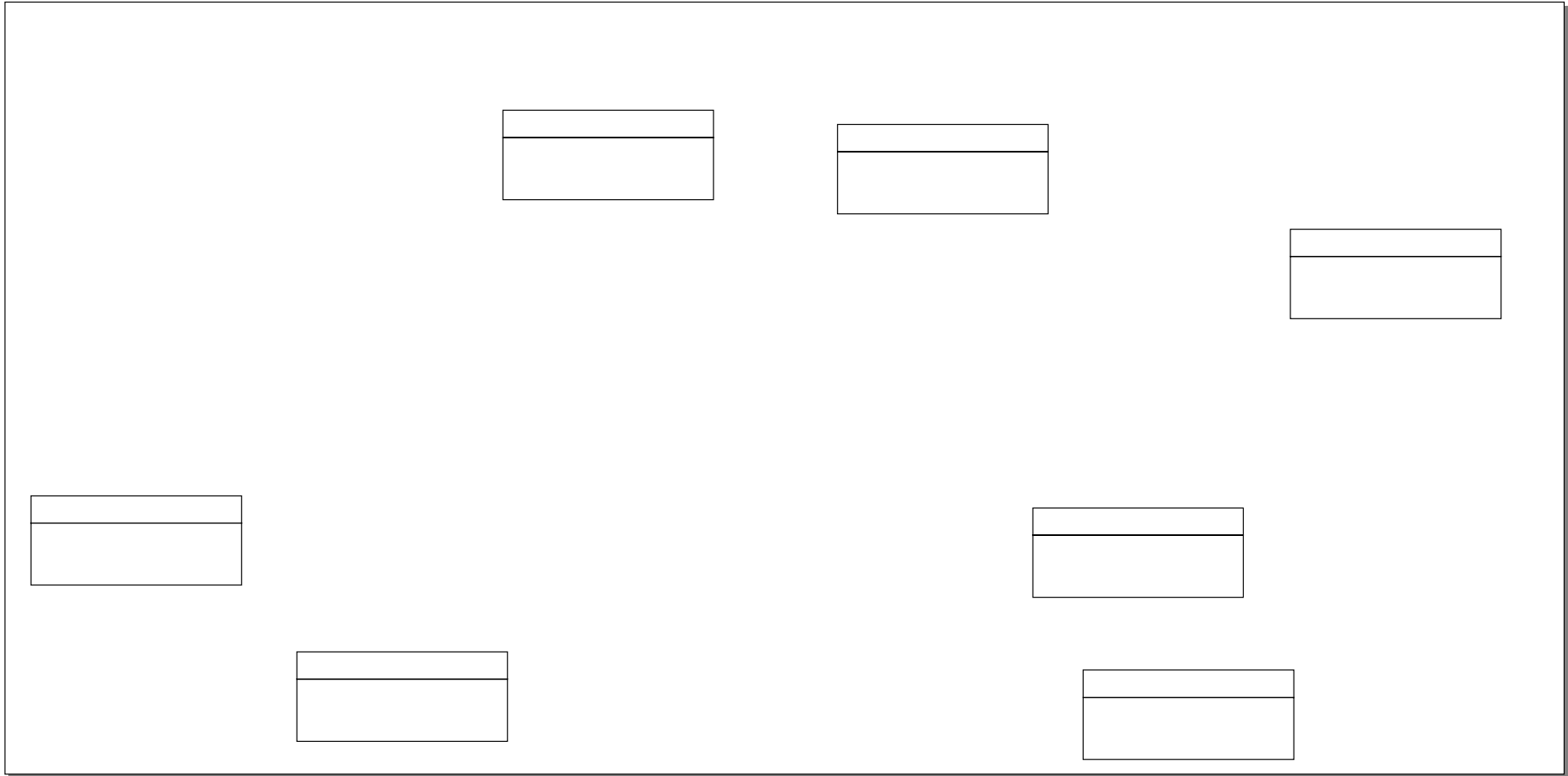
Issues of environmental quality and sustainability represent a relatively more recent addition to Indonesia's development concerns. This is not surprising given the challenges that existed at the start of the First Long-Term Plan about 32 years ago, and what was known at that time about the relationship between economic activities and the underlying ecosystems upon which they depend. The growing attention to these issues in Indonesia's development strategy is a result of the worsening environmental conditions in Indonesia today, due to the pace and pattern of growth in the past, and the increasing awareness of the costs and risks of continued environmental degradation in the future.

The development of water resources over the past 32 years -- irrigation systems in particular, but also water supply systems in urban areas and hydro-electric facilities to meet the growing energy demands of the industrial sector—has played a critical role in stimulating rapid growth and reducing widespread poverty. Issues of water resources management (both quantity and quality) is increasingly important on Java and other islands off Java such Sumatera, Kalimantan, Sulawesi, etc. with different characteristics of the problems and hence approaches to be taken. Problems on Java characterized by overpopulation and natural as well water resources degradation and depletion, while islands off Java mainly characterized by natural and water resources degradation due to widespread of deforestations and improper open mining practices as well as vast expanding of newly opened plantations on the upper watersheds.

As presently experienced in many other countries, the condition of water resources in Indonesia has come to the stage where an integrated action is needed to reverse the present trends of over-consumption, pollution, and the increasing threat of drought and floods.

Given the challenges facing the water resources and irrigation sector in the 21st century and the public sector reformation aspirations, the Government of Indonesia has initiated the water resources sector reform program that covers policy, institutional, legislative and regulatory aspects including water conservation policies have got a substantial portion in the reform agenda.

FIGURE 3.1
KEY STATISTICS BY ISLAND GROUP



Legend:
Population (million)
Irrigated area (million ha)
Rice production (wetland production, million per year)

3.2 Current Status of Country Water Resources

Water Resources Potential

Although water resources are abundant, yet seasonal and spatial variation in the rainfall pattern and lack of adequate storage creates competition and conflicts among users. The annual renewal water resources are estimated to about 3.085 km³ while the estimated freshwater demand in 1990 was of the order of 1.600 m³/s. In spite of the abundance in water resources (13,000 m³/capita/year), the water resources potential per capita varies from island to island. In parts of Java island this is less than 2.000 m³/capita/year while for Irian Jaya (Papua) it is greater than 282,000 m³/capita/year. This large variation in water resources potential poses a challenge for nations development and requires a sound planning and management system in water resources.

The estimated surface water demand (by the year of 1990-2000-2015-2020) by major islands in Indonesia is presented in Table 3.1. Java and Bali, which have 62% of the country's population, have the biggest water demand for DMI. Groundwater potential in Indonesia is limited and can support only part of the urban and rural needs for water supply while providing irrigation water for very limited areas.

NAME	1990			2000			2015			IRRIGATION
	IRRIGATION	DMI	TOTAL	IRRIGATION	DMI	TOTAL	IRRIGATION	DMI	TOTAL	
JAVA/BALI	950	124	1,074	1,609	168	1,777	1,639	239	1,878	1,648
SUMATERA	70	3	73	450	47	497	621	72	693	689
KALIMANTAN	271	26	297	81	12	93	173	20	193	209
EASTERN ISLANDS	19	7	26	342	23	365	495	34	529	555
SULAWESI	120	6	126							
MALUKU	5	1	6							
IRIAN JAYA	2	1	3							
TOTAL	1,437	168	1,605	2,482	250	2,732	2,928	365	3,293	3,101

Source : DPP DMI : Domestic, Municipal and Industrial

In some river basins the available water resources are inadequate to meet the current needs. The status of surface water resources in 1990 is presented in Table 3.2 and shows that Java has already a shortage during the low flow season. The ongoing industrialization and urbanization have put a further strain on the water resources due to water quality degradation. Hence, Indonesia is putting a greater emphasis on holistic planning and orienting its effort towards a mission driven program approach to meet the challenges of the 21st century.

Indonesia has over 5590 rivers. Except for rivers in Kalimantan and a few rivers in Java, most rivers have limited flood carrying capacity. In general the rivers originate from volcanic mountains and have a distinct upper reach where the bed slopes are steep, a short middle reach with moderate bed slopes and a meandering lower reach where bed are flat. Because of high rainfall intensities and upper watershed erosion, most rivers carry large quantities of sediment, which results in river regime problems

as well as mouth problem. Because of the flat slopes and inadequate carrying capacity in lower reaches, many rivers experience flooding in the lower reaches.

To facilitate planning, development, management and administration, the river basins are grouped into river territories called Satuan Wilayah Sungai (SWS). Thus, the country has been divided into 90 SWS or river territories. Of these, 73 SWS, which are fully located in one province, are termed as provincial SWS. The remaining 17 SWS, which are located in two or more provinces or are of strategic importance are termed as central SWS (to be under the management authority of Central Government).

Owing to the rainfall distribution and variability of stream flow between low and high flow conditions, only part of the renewable water resources can be taken by users, unless large storage reservoirs are constructed. Since much of this annual flow discharges to the sea during periods of high flows, the actual volume of useable flow is only about 30% to 50% of the total renewable resources.

**TABLE 3.2
SURFACE WATER RESOURCES STATUS BY ISLAND
IN INDONESIA (1990)**

NAME	AREA (1000 Km ²)	SURFACE WATER POTENSIAL m ³ /s	GROUND WATER POTENSIAL m ³ /s	LOW FLOW AVAILABLE m ³ /s	DEMAND 1990 m ³ /s		
					IRRG.	DMI	TOTAL
JAVA/BALI	139	6199	95	786	950	124	1074
NUSA TENGGARA	81	1777	21	90	70	3	73
SUMATERA	470	23660	NA	4704	271	26	297
KALIMANTAN	535	32279	NA	6956	19	7	26
SULAWESI	187	2488	44	561	120	6	126
MALUKU	78	3373	9	391	5	1	6
IRIAN JAYA	414	28061	NA	4140	2	1	1
TOTAL	1904	97837		17628	1437	168	1603

Source : DPP NA : NOT AVAILABLE
DMI : DOMESTIC, MUNICIPAL AND INDUST

It is estimated that water tends to become a limiting factor in national socio-economic development when water withdrawal exceeds 20% of the total renewable water resources. While it is difficult to generalize, a higher level of water use relative to water supplies implies that role of water in socio-economic development is becoming more important. Water availability may therefore become a limiting factor in national development.

Although Indonesia has an abundance of rainfall, with a national average of over 2500 mm/year of which 80% falls during the rainy season; however large regional variations in the rainfall exist over the country. It is ranging from the very arid areas of Nusa Tenggara, Maluku and parts of Sulawesi Islands (less than 1,000 mm), to very wet areas in parts of Irian Jaya, Java and Sumatra (more than 5,000 mm). The average annual renewable water resources, or surface water potential per island, can be expressed in terms of per capita population (1990), by dividing the islands into their relative catchments and estimating run-off using a rainfall/run-off relationship (UNDP/FAO, 1992). These vary between a maximum of 543.230 m³ in Irian Jaya, to minimum of 1,767 m³ in Java and Madura, and 2,003 m³ in Bali.

Using this approach, the average annual surface water potential for the whole of Indonesia is 18,178 m³/capita (1990). With estimated total annual per capita demands of approximately 40 m³, the water resources availability would not yet appear to be significant constraint on further socio-economic development in Indonesia. Nevertheless, considering the annual surface water potential per capita in Java (including Madura) at 1,767 m³, with an estimated population of 120,4 million, the annual per capita water demand amount to 482 m³, or 27% of the available water resources, the high water demand would potentially become a limiting factor on socio-economic development.

Water Resources Demands

The demand on water resources has rapidly increased as the nation implements its development program to meet the sharply increasing needs for irrigation, safe drinking water, industrial water, energy, etc. the irrigation, domestic and industrial surface water demand which formed the bulk of the demand in 1990 and projected demand for year 2000, 2015 and 2020 by islands is presented in Table 3.1, indicates that over the period (1990 – 2020) the demand will increase by about 220%.

Despite Indonesia's remarkable achievement in reducing the population growth rate, population still continues to grow. An average rate of 1,2% will push the population level to about 250 million in 2020. This growing population will create an increasing demand for food and even greater pressures on land and water. Also, the labour force will grow at an appropriate rate of 2,2% requiring a rapid growth in employment opportunities.

Taking into consideration of the estimated population growth rates and the corresponding requirements for domestic, municipal and industri (DMI) uses, the total projected DMI demand for water in the year 2020 has been based upon. Similarly, predictions can be made for irrigation demands, based on population projections and food (rice) requirements to maintain self-sufficiency. Water demand for river maintenance is estimated by multiplying projected urban population by per capita flushing water requirement. Total annual water demand on each island in year 2020 is shown in Table 3.3 below.

Table 3.3 Annual Water Demand and Estimated Natural Basic Discharge in 2020

Unit: MCM

Region	DMI	River Maintenance	Irrigation	Fishpond	Livestock	Total Demand	Estimated Natural Basin Discharge
Sumatra	2.630	2.733	15.992	1.275	155	22.766	482.173
Jawa & Bali	9.850	9.799	54.918	809	258	74.569	122.699
Kalimantan	768	820	3.643	753	29	6.014	556.700
Sulawesi	686	769	14.243	354	110	16.612	143.343
Maluku & Nusa Tenggara	406	444	5.526	40	69	6.485	45.909
Irian Jaya	107	124	48	0	2	281	496.422
Indonesia	14.401	14.670	94.370	3.213	623	127.277	1.847.246

Out of 1,947 billion m³ of available water (natural basin discharge per year), about 127 billion m³ will be used for DMI, Irrigation, River Maintenance, etc. Balanced of about 1,720 billion m³ is available for another new development of DMI, Mining, and for Agricultural uses. In order to be able to regulate the water allocation and distribution to meet water demands for various purposes, the “real-time management” of all water resources in each river basin, must be made operational, both under the normal and emergency conditions. This can only be achieved by adopting the integrated approach to river basin planning, with the necessary regulations and procedures in place, to provide the means of “managing” the water resources efficiently on integrated basis. For these purposes, a number of policy instruments are currently being set up under the policy reform program for putting integrated approach to river basin management.

3.3 Water Resources Development

Traditional Practices on Water Resources Development

The role Water Resources Development in Indonesia has been put by the ancient generation of Indonesian, highly importance. This had been supported by strong evidence for the case for agricultural water utilizations. In fact, a number of experiences in traditional irrigated farming in Indonesia -- among others, *Subak* in Bali, *Keujreun Blang* in Aceh Special Province, *Tua Banda* in West Sumatra, *Raja Bondar* in Northern Sumatra, *Mitra Cai* in West Java, *Dharma Tirta* in Central Java, *Tudang Sipulung* in South Sulawesi, *Mantri Siring* in South Sumatra, *Ili-ili* in Lampung -- concluded that the traditional practices on water resources development in the past had been sustainable and also with application of environmentally friendly technologies. In fact, these traditional technologies and practices are still applied and maintained by the present descendants – especially within the village irrigation schemes – scattered over many parts of the country.

The *Subak* irrigated agricultural practices in Bali, for instance, has been in existence and practiced from generation to generation for hundreds of years, and amazingly still continuously practiced today in modern Indonesia. The average area covered by one *Subak* organization is about 100 ha, depending upon the magnitude of the area covered by the irrigation command area of the *Subak* system. However, due to individual characteristic of the topographical condition, one *Subak* organization may covers an area in the range of 10 to 800 ha. Under the very special condition, one independent *Subak* may cover an area even smaller than 10 ha. Natural creeks, small valleys, small rivers or village roads usually form the boundary of a *Subak*. Today, in the entire Bali Island, there are 1,410 independent *Subak* systems covering a total area of 99,123 ha. This figure would likely remain constant and yet sustainable toward the long-term future. The features for other existing traditional irrigated farming systems in Indonesia, despite their practicability, are not presented in this paper separately, because they are already administered compounded with other village irrigation schemes.

Current Water Resources Development

Having a vast land, large number of population with abundant natural heritages, water resources have played a major role in Indonesian development. Currently, over 5.5 million hectares of agricultural lands have been served with technical irrigation schemes. Parallel with these, another 1.6 million hectares are irrigated under the village irrigation schemes. These involved diversity of either construction or rehabilitation works of about 12,500 diversion structures and 40 reservoirs. Apart from these, Indonesia has also been able to extend water resources utilization

progressively to support its 2,200 megawatts of hydropower generation -- which is now encompassed about 20 percent of the nation's electricity generating capacity. Rural and Urban water supply schemes deliver close to 100,000 litres per second of piped drinking water.

On top of the above achievement, over 3.3 million out of the 3.4 million hectares of swamplands have been developed and major flood control and drainage projects have been implemented. In addition, nearly 18,000 hectares of fishponds have been developed mostly in Aceh, North Sumatra and Sulawesi. In addition, about 1.96 million hectares of lowlands and urban areas are provided with flood protection infrastructures, compounded with 15 kilometres of coastal structural protections.

3.4 Agriculture

Water use for agriculture in Indonesia accounts for 80% of the total water demand. Around 72.5 % of the total area of 47 million hectares is used for agriculture. The land for estates comprises around 156.5 million hectares, arable dry land is approximately 12.8 million hectares, and woods around 8.9 million hectares and fresh water ponds cover only 0,5 million and 0.2 million hectares respectively.

Food Crops: In line with the country policy on development of agriculture, including food crops, estate crops, forestry, animal husbandry, and fishery, the strategy for water resources development has been set up to support the policy. Food crops cover rice (wet field rice and dry field rice), maize, cassava, sweet potato, peanuts and soybeans. Although the harvest area of rice decreased in 2000, the total production showed an increase of 0,62%, reaching 51.18 million tons, compared to the 50.87 million tons of the dry field rice of the previous year. The production of wet field rice increased around 0,64% and dry field rice increased around 0.12% compared to that in the previous year. The increase of production is in line with the increase of productivity. The productivity of rice was 42.52 quintals per hectare, or an increase of 3.69%.

The production of rice in Indonesia shows a concentration in Java Island where rice is produced around 56.98% or 29.16 million tons of the total production in the country. The harvest area of rice in Java reached 49.52% of the whole harvest area in Indonesia with a productivity of 50.73 quintals per hectare in 2000.

The production of second crops such as maize, peanut, and sweet potato showed an increase of 1,53%, 4.90% and 8.85% respectively, to that of the previous year. However, the production of cassava and soybean decreased around 6.73%, and 26.97%, but the productivity of the soybean increase around 1.67% compared to that in 1999.

In 2000 the production of vegetables also showed an increase. It has increased by 10,75%, which is 4.467,4 thousand tons, compared to that of the previous year. The production of vegetables is also predominantly in Java. The production of shallots decreased around 6.02% compared that of the previous year. The harvest area showed an increase of around 0.61% in the year 2000.

Animal Husbandry: The field of animal husbandry is divided in three groups: the large livestock, small livestock and poultry. In 2000 the total number of the large livestock, milk cow, cow, buffalo and horse, indicated a little bit increase. The highest in-crease was that of the horse population (6.86%). Most of the large livestock farms are

located in Java. The small livestock, consisting of goat, sheep and pig, showed an increase of 3.42%, 3.13% and 3.13% respectively, compared to that of 1999. The population of poultry increased by 34.57% for the broiler, and 1.9% for the manila duck. The total number of slaughtered livestock has also been increased.

Fishery: In an effort to meet the need of fish in Indonesia, the development of fishery is continually enhanced. In 2000, the product of marine and inland fishery has increased 1.79% from that of 1999. The entire fish production was estimated at 5.1 million tons.

3.5 Water Resources Problems

Because of its multiple roles—economic, ecological, and socio-cultural—most issues of sustainable development in Indonesia are related in one way or another to the management of land. As a result of growing population pressure and intensity of economic activities throughout Indonesia, land-related issues of efficiency, sustainability and equity have become increasingly important. On Java, the conversion of upland forests and coastal wetlands to agricultural use has led to soil erosion, watershed degradation and the loss of valuable marine resources. The rapid—but often uncoordinated—expansion of urban areas results in less-than-optimal land use densities and efficiency in the provision of infrastructures.

Java Island – with 60% of the country’s population – currently has 70% of the country’s irrigated agriculture, and 75% of water demand for industry. This has been associated with the escalation of conflicts amongst the competing users (agriculture, industry, and domestic), including competition between surface and groundwater utilization in urban areas.

The problem is one of seasonal and annual variations, compounded by the fact that river basins on Java currently suffer from severe degradation. During the wet season river flows bring high rates of sedimentation due to excessive erosion on the upstream watershed. These cause very fast sedimentation rates on reservoirs and lakes, making the lifetimes of reservoirs shorter than planned. While a number of dams have been built in major river basins such as Citarum, Brantas, Serayu-Bogowonto, and Bengawan Solo –accommodating about 5% of total river flows, the reservoir capacities of these river basins were only planned to meet the water demand for various uses up to the planning horizon of 2010. Several additional sites have been identified for possible future dams, but implementation is likely to be constrained by high population densities and the intangible social and economic costs of human resettlement.

The bulk water use in agriculture currently accounts for 80% of total water demand, while industrial and municipal requirements together account for only about 20%. The domestic water consumption as well as for industry would be rapidly growing in the next two decades to the magnitude of about 25% - 30% of total water demand by the year 2020.

To support continued rapid growth and improvement in human health and welfare, however, these needs will have to be met. This will require a shift of water in the dry season from agriculture to municipal and industrial use. Being the case, greater attention is needed to the process of water allocation so as to minimize the social and economic costs for farmers, at the same time, to protect the potential disruption to agricultural production.

Under this dilemmatic condition, the Government of Indonesia is fully aware of the need to manage its water resources on an integrated river basin basis. More important would be to ensure the appropriate balance of conjunctive use of surface and groundwater – particularly in the densely populated urban areas. Many of the aquifers in Java’s rapidly growing urban centres have already suffered from over-extraction, resulting in salt-water intrusion and ground subsidence in many coastal urban areas.

The challenges of meeting the demand for water in the dry season are complicated by the growing volume of pollution from urban and industrial sources. Most of the major rivers on Java are badly polluted with a combination of untreated domestic wastes and largely from uncontrolled industrial effluents.

Meanwhile, the groundwater aquifers in many urban centres are also polluted, primarily by human wastes, but with increasing evidence of industrial waste as well. The underlying contamination of water supplies, in part also due to the clogging of drains and canals by solid wastes. Over the longer, toxic and hazardous waste poses an even more serious threat to human health and welfare. Sample of groundwater in Jakarta, and marine life in Jakarta Bay, for example, already show evidence of contamination by toxic metals (e.g., mercury).

In the outer islands, the key issues arise from the conversion of both forest areas and coastal wetlands into agricultural lands, and also due to uncontrolled logging. During the last three decades, water resources policy issues in the outer islands have been mainly concerned with the sustainability of the newly constructed irrigation schemes. Soil erosion and high fluctuation of river flows between the rainy and dry seasons has been hampering the effectiveness and sustainability of the schemes. This in turn, resulting significant escalation of Operation and Maintenance (O&M) costs of the water resources infrastructures. For some parts of the low lying areas, sedimentation on the lower reach of river such as the case of several main rivers in Kalimantan, has been threatening the routine accessibility of natural harbours on the river mouth as well as for the inland water transportation -- especially during the dry season.

4 Indonesian Water Resources Policy Reform

4.1 Need for Sector Reform

There are three major considerations that necessitate this policy reform: a) the nature of water resources problems in Indonesia, b) continuous need for achieving food security and sustainable irrigation, and c) overcoming institutional constraints.

Water Resources Problems

Indonesia’s water resources management still faces increasingly complex long-term problems and investment challenges. Unless effectively addressed, it will increasingly constrain the country’s economic development and food security. The problems arise from the adverse impacts of population growth, urbanization and industrialization.

The key sector problems are:

- i. water allocation is under local scarcity due to growth of non-irrigation water demand;
- ii. inadequate urban access to piped water supply while affordable investment in urban water supply facilities is unable to cope with the growth in demand;
- iii. water pollution and adverse impacts of untreated municipal wastewater discharge, including industrial and mining effluent disposal;
- iv. adverse impacts of watershed degradation such as increasing flood peaks causing economic damages, decreasing dry season flow and sedimentation damages to water infrastructure; and
- v. adverse environmental impacts of poorly planned swampland development designed to meet the country's food security needs, as well as income generation for transmigration settlers.

Capital investment required mitigating these problems run into billions of dollars. It is therefore essential that Indonesia tries to use improved institutional frameworks, planning and management, as well as greater beneficiary participation to meet these challenges.

Achieving Food Security and Sustainable Irrigation

While about 80% of domestic rice production comes from irrigated areas, food security is uncertain because of problems that have constrained public irrigation performance and sustainability. Sustaining rice and food production also requires an effective irrigation O&M program instead of deferral of routine maintenance and dependence on periodic externally aided investment for irrigation scheme rehabilitation. Also, government's investment strategy of maintaining rice security through expansion of irrigation and swamp reclamation on the Outer Island needs review, particularly with respect to the choice of most cost-effective and environmentally sustainable interventions.

Despite preservation of central O&M funding in real terms at about \$70-80 million/year since 1987, allocated funds are used primarily for staff activities, while whatever remains (about 15-40 percent) is generally used for urgent repairs needed to ensure water delivery elsewhere. Since 1997, O&M funding is provided to provinces as part of the general provincial block grant transfer mechanism; this has resulted in provincial governments allocating about 25% less resources to O&M while Rupiah devaluation has further reduced the O&M budget value. Our past attempts to transfer management of small irrigation schemes to farmer controlled Water User Association (WUAs) has not met with much success while our attempt to establish effective WUAs on large irrigation schemes has also not succeeded.

Institutional Constraints

Mitigating the sector's multifaceted challenges has been difficult because of:

- (i) growing inadequacy of both legal and regulatory framework;
- (ii) non-implementation of legal provisions which would require payment for bulk irrigation water supply and municipal or industrial effluent discharges fees;
- (iii) weak sector institutions for integrated water resources policy formulation investment planning, governance, management, strategic allocation of scarce resources and water pollution control;

- (iv) inadequate coordination of government agencies in addressing problems and diseconomies that require concerted inter-government cooperation and action;
- (v) a “construction project administration culture” with scant attention to effective service delivery and program based on economic incentives and regulatory sanctions;
- (vi) acceptance of a deferred maintenance cycle leading to premature externally-aided capital-intensive rehabilitation;
- (vii) complexities of human resources deployment, performance incentives, budgeting and organizational structure have prevented devolution of central government roles and powers to regional and local government; and
- (viii) absence of appropriate mechanisms for stakeholder consultation and representation in sectoral decision-making institutions.

4.2 Water Resources Management Policy Reform

Reform Principles

In April 1999 the Government of Indonesia (GoI) formulated the Letter of Sector Policy and Policy Reform Matrix, which formed the basis of the Indonesian Water Resources Sector Adjustment Loan (WATSAL) of the World Bank. This was the start of major institutional reforms, including policy, legal, organizational and financing aspects, aimed at improving overall water resources and irrigation sector performance. The sector reform is based on the following principles:

- *Empowerment*: water users and other stakeholders democratically define what kinds of water services they need, who will provide them and how they are provided.
- *Accountability*: delivery of water services should be demand driven and ensured through service agreements, management audits and effective regulatory institutions for water resources
- *Sustainability*: physical and financial sustainability of water infrastructure depends on proper application of the above two principles, efficiency in service and delivery and smart subsidies designed to stimulate local investment and elicit appropriate behaviour.
- *Unbundling of support services* for irrigation and irrigated agriculture are diversified to promote choice, competition and greater accountability with irrigation being a responsibility for the Kabupaten (districts).

Implementation of these principles in practice is a major change in governance and management culture. This will take time and requires a process approach based on reasonably achievable benchmarks. As a first step the principles have been or will be legalized in a new basic Water Resources Law, Government Regulations, Presidential Decrees, Ministerial Decrees, Administrative and Technical Implementation Guidelines and Administrative Instructions.

Objectives.

The on-going reforms are addressing water resources’ problems and structural deficiencies through policy, legislative and institutional adjustments more conducive

to attainment of food security, sustainable water and land use and an improved aquatic environment. Our specific sector reform objectives are:

- (i) establishment of a national intergovernmental water resources and irrigation management coordination framework;
- (ii) adoption and implementation of a bidding National Water Policy to guide sector planning, programming, budgeting, real time management;
- (iii) establishment of institutions and procedure for the involvement of stakeholders and water resources service beneficiaries in river basin management policy formation and decision-making;
- (iv) improving national water resources management information and decision-support data systems and networks;
- (v) fostering integrated management and regulation of river basin water resources;
- (vi) establishing effective management organization in strategic river basins;
- (vii) introducing a water rights system for secure, equitable and efficient water allocation;
- (viii) establishing institutional frameworks for enforceable water pollution control;
- (ix) transparent empowerment of farmer irrigation organization with governance and financial powers to manage irrigation networks transferred to their control;
- (x) ensuring fiscal sustainability and efficiency and efficiency of O&M and rehabilitation of irrigation schemes; and
- (xi) reorganization of irrigation services administration.

National Water Resources Management Policy

Water resources related activities must be synchronized at the national policy and strategic level so that resources and efforts can be effectively directed towards achievements of common public goals. To support water resources development and management, the government of Indonesia is reviewing current policies and procedures in water resources and formulate a National Water Resources Management Policy framework that is able to support and guide the development and conservation efforts of all government and private entities. The policy is covering water quantity and quality for both surface and groundwater in the context of river basins, including upper watersheds and estuarine areas. A specific component of the policy is dealing with environmentally and socially sensitive swampland development issues.

The National Water Resources Management Policy (NWRMP) would include:

- i. introduction of a water rights framework for water allocation and utilization conducive to economic and social development and environmental sustainability;
- ii. improving the efficiency in utilization of water, particularly for irrigation;
- iii. attaining regional surface and ground water quality levels that are compatible with both socio-economic development and environmental sustainability;
- iv. developing participatory institutions for prioritised, integrated spatial and river basin planning processes, based on participatory involvement of stakeholder representatives in water resources and irrigation decision-making and activities;
- v. establishing an enabling mechanisms for community management and financing of irrigation networks;
- vi. establishing a sustainable planning, programming and budgeting system for water resources development and management under a framework for regional autonomy and government decentralization;

- vii. creating a national and regional water resources management structure to support and implement integrated river basin management;
- viii. improving coordination between forestry, agriculture, conservation and water resources sector activities in watershed management; and
- ix. establishing a specific integrated policy for environmentally sustainable wetland and swampland development.

Output of the Water Resources Policy Reform

The implementation of the reform agenda on water resources sector would lead to the following changes that need the follow up action plan:

- establishment of a national water council or coordinating body at Ministerial level;
- a national water resources policy-and the necessary legal, regulatory and administrative instruments needed for implementation of that policies;
- reform of the *Jatiluhur (Jasa Tirta II)* Public Company, and establishment of four new self-financing river basin management agencies;
- establish of Basin Water Coordination Committees, Provincial Water Coordination Committees and Hydrological Units in the key river basins of at least eight provinces;
- stakeholders representation on Provincial and Basin Water Coordination Committees;
- development of an improved regulatory framework, and use of fiscal incentives to reduce river and reservoirs pollution by mining, industry and urban areas;
- establishment of a system of water use rights for water allocations, and an improved water waste discharge permits to facilitate water quality management;
- establishment of institutional and fiscal framework that enable self-governing Water User Association (WUAs) and federations of WUAs to operate and maintain secondary irrigation canals;
- reform of national and local irrigation administrations to serve WUAs and establishment of demand based system to finance WUA maintenance and rehabilitation expenditures; and
- development of a national water resources management information system and database.

5 Challenges for Indonesian Water Management

5.1 First challenge: Meeting Basic Needs

Access to safe and sufficient water and sanitation are basic human needs and are essential to health and well-being, and to empower people, especially women, through a participatory process of water management.

The Indonesian Water Vision described in Chapter 2 is formulated in accordance with the underlying philosophy, traditional practices and norms, the national identity as well as way of life rooted from Indonesian culture and constitution which adhere to the principle that the water as the most important ingredient of human life is bestowed by the Almighty God with all of its social and economic functions, and not a

tradable commodity. Government guarantees the right of each citizen to get water for basic human needs. The Indonesian Water Vision contains several definitions on provision of water for basic needs as follows:

- Opportunity to have stable water supplies (sufficient, accessible, safe and healthy water supply) for all the needs of human living spiritually as well as physically and for the environment;
- Opportunity to get access to the water availability through variety of efforts including the provision, protection, conservation and security for attainment of prosperity of the people in the entire Indonesian territory.

Indonesia is a tropical archipelago state, therefore water transfer between islands is very expensive. Consequently, it is imperative to sustain and reinforce our efforts so as to be able to maintain, preserve and develop this resource in a balanced way within island.

Indonesia is facing increasing freshwater supply problems, particularly on the islands of Java, Bali, Nusa Tenggara Timur where the demand for water is higher than available water supply. Issues associated with freshwater are population growth, industrialization, urbanization, groundwater overuse, and inadequate supply of freshwater in some regions. The demand for water for domestic use is projected to be about 14.4 billion m³ in 2020 (Table 3), which means an annual increase of 3% between 2000 and 2020. This figure has not included freshwater consumption by agricultural sector that accounts for 95-98% of Indonesia's water resources and is growing by 2.5% annually until 2020.

The Availability of Safe Water

Unsafe water is one of the major sources of disease in Indonesia, and the lack of adequate sanitation facilities is a primary cause of faecal contamination of urban water supplies. An important indication of the threat this poses to the urban is the fact that, with exception of bottled water are not safe to drink (World Bank Report, 1994). High levels of chemical contamination were also detected in most well. Tap water samples in Jakarta in 1992 reveal a 73% rate of coliform contamination, with a 55% rate in drinking water from wells.

A major reason for the poor quality of water supply in urban areas is that about two thirds of public water supplies are derived from increasingly polluted surface waters. Since groundwater are already being over-extracted in many large coastal cities, surface water may be the only source of incremental supply for expanding public water systems. Although demand from municipal and industrial users will remain relatively small compared with the total resource base, the supply of surface water must have very high security and be used more effectively. Unfortunately, the lower reaches of most rivers are already polluted beyond the capacity of existing treatment plants. A technically feasible option would be to upgrade the plants to handle more polluted inflows, but this would be an expensive solution and would only address the problem until pollution levels again exceed treatment capacity. The only sustainable solution, therefore, is to clean up pollution at the source (i.e., to address the growing challenge of urban and industrial pollution).

Issues in Sanitation and the Disposal of Human Waste

The main issue associated with sanitation system in Indonesia is that they are often operated with little regard to safe human disposal. Commonly, septic tanks are not emptied regularly and many public facilities, housing estates and private toilets owner

by-pass effluent pipes directly to the drains to avoid the costs and inconvenience of de-sludging. Numerous toilets with little regards for guidelines specifying the type of on-site system which are appropriate for local population densities, water intakes, soil permeability, and depths of groundwater table. Many kelurahans in Jakarta, for example, fall within the 150-500 people per hectare densities where the appropriate for local conditions needs to be carefully weighted to safeguard the safety of the system. Individual households, however, have inadequate incentive to adhere to the guidelines when installing and maintaining their sanitation systems, since they can easily shift the effects of their overflowing systems to residents of "downstream."

Issues of Water Service Delivery

Currently about 41% of the nation's population is living in urban areas. Among those only 51.7% or 20% of the total population has a piped water service from The Regional Water Utility Company (PDAM), of which 90.2% is used by the domestic sector. On the other hand, only 8% of peoples who living in rural areas have access on piped water provided by a Unit Pengelola Sarana (Utility Management Unit) or an Infrastructure Management Group.

The total number of PDAM in the year of 2002 is 293 units (including 5 units that are managed in partnership between local government and private international water company). It means that almost all of district and city have their own water company regardless its economic scale is not appropriate. The ratio of water pipe utilization (the ratio between the sold pipe water to the total installed capacity) is about 76% of the installed capacity of 2,998.4 million m³/year. A survey conducted by The Indonesian Association of Regional Water Utility Company (PERPAMSI) shows the following statistic:

- 82% of the total number of PDAM have a negative profitability and 18% have a positive profitability;
- 78% of the total number of PDAM have a positive equity and 22% have a negative equity;
- 44% of the total number of PDAM have a revenue that lower than their Operation & Maintenance (O&M) cost;
- 10% of the total number of PDAM has a healthy financial condition.

There are number of other key issues that affect the water supply industry today, such as:

1. *Appropriate size of PDAMs:* A review of economies of scale indicates that the optimum size of an enterprise should be approximately 100,000 connections, implying that many PDAMs would need to amalgamate in order to become operationally more efficient, and the cooperation among PDAMs should be encouraged. This approach would also achieve more effective investment planning, especially in larger urban areas that cover more than one local government.
2. *Low urban coverage:* This indicates a much higher demand for access to good quality water and a willingness to pay for improved services.
3. *Low tariffs:* The tariffs are based on social considerations only, rather than respecting the business principle of full cost recovery. This is a "double edged sword" for the PDAMs because local government are denying adequate revenues for the enterprise, whilst at the same time they abstract dividends to contribute to their local budget; and

4. *High debts service:* It is now even more difficult to repay high debts due to the higher operating costs for fuel, chemicals, electricity and spare parts. As a part of the recovery process for the water supply sector, a rescheduling of debts is essential provided this is accompanied on a case-by-case basis recovery action plan.

Issue of Rural Water Service

Water related diseases are still hampering the live of some part of citizen, especially the ones living in remote rural areas. Almost all of flood disasters bring water related diseases on inundated areas in urban as well as rural areas. Problems of a clean water service in rural areas are more caused by lack of awareness and lack of knowledge on clean and healthy live behaviour. Among those are reflected on the fact that many of shallow wells are located close to a septic tank and other negligence on water quality and quantity. This condition has caused the number of diarrhoea is still high about 4.72% in rural areas and about 4.33% in urban areas and similarly for other diseases such as skin diseases.

At present concern and involvement of rural community on provision and management of safe water supply is getting increase. However, they still need technical guidance on utilization, operation and management of water supply utility and most importantly a policy on pro-poor rural water investments and an access to build partnership with private investor.

What Needs To Be Done

The Millennium Development Goals and Johannesburg Summit 2002 has set targets of reducing by half by 2015 the numbers presently not-served by improved water supply and sanitation. While all of world population have to have access on safe drinking water by 2025. The challenge facing Indonesia to overcome this situation is three-fold:

- to extend water supply and sanitation coverage to the presently not-served;
- to provide coverage to cope with predicted population growth, including the associated urbanization;
- to ensure that existing water supply and sanitation system are properly operated and maintained.

The exercise of the current water supply capacity and future demand up to 2015 and considering the existing capacity of 120,000 l/sec. shows that by 2015 the installed capacity is about 215,000 l/sec (without any change on government policy) while the real demand is about 377,400 l/sec or about 11.9 billion m³ annually. To achieve the Johannesburg Summit 2002 Plan a total investment of Rp 66.43 trillion is required and this is associated with an investment rate of Rp 5.1 trillion or equivalent to US \$ 573 million annually. This is a formidable challenge for a country with a typical total annual government spending on public infrastructure (roads, bridge, irrigation, water resources infrastructure, water supply facilities, housing, etc) of about Rp 11 trillion.

What Is Being Done

Presently, the government plan on expansion of urban water supply is about serving 62% of urban inhabitant (66 million people) by the year of 2010. However, it means still about 40 million urban million still not-served.

While increased investment in urban water supply will clearly be needed, a review of the “demand side” issues will be equally important. In particular, the strategy for improving on current conditions must take into account the availability and pricing of alternative sources of water (including surface water in rivers and canals/irrigation canals, shallow wells, public standpipes, water from vendors, and commercially bottled water).

Expansion of the distribution network will be important in all major cities, but most of the local water agencies could achieve a significant increase in the basic supply of water by simply reducing the proportion currently “unaccounted for” (which is often as high as 35-40%). Reducing such losses would allow continued growth in the number of household connections without the need for additional treatment capacity. In some cities, including Jakarta, there is already excess capacity in the treatment facilities, and a high priority should be given to increasing the number and density of household connections.

What Remains To Be Done

Urban Water Supply Program

In the era of autonomy, since the Law 22/1999 was implemented, the responsibility of water supply affairs presently lies with local government. It is considered that a partnership arrangement between central and local governments should be developed to give very high priority to increasing the supply of safe piped water to the low-income communities that are not adequately served.

Considerable concern has been expressed about the sustainability of water supply services that have been developed for low-income communities in urban areas, and more particularly for rural and small urban communities. As already observed, the top-down planning processes and the lack of real consultation at local level have resulted in many rural and peri-urban schemes falling into disrepair. This is compounded by the unwillingness of communities or institutions to accept responsibility for O&M that have been “passed on” after completion of physical investments.

Community based development and demand side approaches are now seen as the key to future small-scale water supply solutions for low income areas in cities, the urban fringes, and for rural areas. The Government’s policy is the same as for the formal sector needed in urban areas – every person has an entitlement to safe water arrangements.

In the context of regional autonomy, it might be argued that national targets should no longer be considered as one single standard. Each region should select its own needs according to local conditions and priorities in accordance with guidelines on access to safe water and conforming to environmental objectives. Thus, the targets will become qualitative as well as quantitative, with emphasis on fair and equitable access to suitable standards of a basic human entitlement.

Looking at the future projected water demand up to the year 2008, it is notice that a critical feature of the water supply sector today is how to finance increased urban water supply coverage without the central government funding and international support. With sector reform, It is expected that the existing water enterprises or groups of enterprises) will expand significantly to meet demands for water from an increasing population including for providing improved access to water for the poor at a fair price, System expansions and improvements are urgently required,

especially as a result of the last 5 years of limited sector investment. To cope with the above challenge, it is recommended to:

- i. *Turn to Consumer Demand and Community Based Solutions.* Lesson learnt to the assessment of earlier project performances, future planning, design and implementation activities need to be more closely tuned to consumer demands and willingness to pay, whilst at the same time emphasizing the need for conformance with national standards and regulations.
- ii. *Increased Participation of the Private Sector.* Gradually, as the economic environment improves and the regions realize that government funding, even with international donor agency assistance, is very limited, they will turn to partnerships with the private sector to improve and develop their services. This does not necessarily mean a “wholesale takeover” of enterprises; a gradual process of change can be introduced under asset management arrangements, particularly to support the reduction of water losses about which there appears to be a lack of industry motivation.
- iii. *Re-grouping of Water Enterprises (PDAMs).* Voluntary mergers between PDAMs (Medan and Semarang for example) are already happening. As the advantages of economy of scale become more apparent, it is anticipated that more local governments will follow. By significantly reducing the number of water entities, and in consequence the complete separation of PDAMs from the local authorities, the resulting larger enterprises would become corporations responsible for serving areas within their jurisdiction. Regionalized corporations would become independent customer oriented and business focused entities, facilitating the greater participation of the private sector.
- iv. *Corporatisation of Water Enterprises (PDAMs).* The resulting legal form of these corporations is expected to be a limited company, dispensing with the Perusahaan Daerah concept and its associated bureaucracy. Financial management and control of each entity would be conducted in accordance with commercial practices, and independently audited by private firms so that they would no longer need to fall under the government’s auditing system. The resulting corporations will be responsible to the government and representative stakeholders through regulatory bodies that will have extensive powers, even to the extent of limiting / controlling returns on equity to corporation shareholders.
- v. *Improved Environments through Better Wastewater Management.* Financing these services will require much greater commitment by local governments than has been practiced to date, remembering that central government’s development budget is now substantially transferred to the regions. A partnership arrangement is suggested between the central and regional governments to promote local environmental strategies and action plans that would be funded primarily from local resources (public, private and community funds) but with central government support for technical guidance and strategically applied donor funded assistance that promotes sector reform.

Rural Water Supply and Sanitation Action Program

Improve water supply and sanitation for the poor, particularly in rural areas, and make such investments more effective in reducing poverty. Much is already known

about affordable local solutions to improve water services for consumption and household use, food production, to reduce water-related hazards, and to protect ecosystems on which the poor often rely for their lively hoods.

For preparing the program lies in the need to generate more demand-responsive investments that reduce poverty by improving the water supply and sanitation of the rural poor. The program will need to be designed so that it can break barriers to increasing such demand-responsive rural water investments by strengthening local capacity and pro-poor water governance, streamlining processes, and building partnerships.

Objectives

The program goal is to help reduce to poverty by improving the water supply and sanitation of poor people in rural areas, by improving access to water and sanitation, promoting pro-poor water governance, reducing vulnerabilities, and sustaining the resources base. The objective will be to create partnerships that will help to increase pro-poor rural water investments and improve their effectiveness. The program will help to achieve the Millennium Development Goals for reducing poverty and hunger, providing water supply and sanitation, reducing child and maternal mortality, and morbidity from water-related disease, and improving environmental sustainability. This will be done through a participatory and demand-responsive approach that combines advocacy, hygiene education, capacity building, and community empowerment with additional pro-poor water investments in rural areas.

Scope

Under the program, action programs will be developed and implemented in participating local government to directly target improvements to the water supply and sanitation of the rural poor. The scope of the action programs needs to be developed in the context of the needs in each local area. Wherever feasible, programs would not exclusively focus on water management, but would include related measures (such as land management, capacity development or improving access to inputs and markets) necessary to ensure the viability of the water-related livelihoods opportunities.

The program would also integrate ecosystems approaches as central to their methodology, and ensure sustainability and effective targeting to the specific needs and capabilities of poor people in relation to the natural resources they depend on. The subsequent approach to water management would be to ensure adequate water allocations to maintain the ecological integrity of the ecosystems.

The key to success will be strengthen institutional capacities, pro-poor water governance, including the water resources allocation and access to water services, and streamline processes at local and national levels through which different needs and options can be identified and turned into practical steps for implementation and investment. This reflects the need for flexibility and demand-responsive approach in the government, funding and other institutions working together in the programs.

Implementation Strategy

Based on demand-responsive approach, these inter-related strategies form a comprehensive approach to the implementation of policy and the achievement of the objective:

1. Develop a legal framework that enforces active community participation in the planning, implementation, ownership and management of water supply and sanitation facilities and services.
2. Increase investment in the user community's human resource capacity.

3. Apply the cost-recovery principle to ensure that the water supply and sanitation facilities and services are fully and financially self-sustaining.
4. Encourage different funding options for the development and management of water supply and sanitation facilities and services.
5. Enable the user community's decision-making in all aspects of water supply and sanitation development and management.
6. Improve the community's overall technical, financial, institutional and managerial capacities of water supply and sanitation facilities and services development programs.
7. Prepare guidelines to improve the development of water supply and sanitation facilities and services at the planning, implementation, operation, maintenance and management levels.
8. Support the consolidation of research, development and dissemination of water supply and sanitation technology options to better-informed choices by the user community.
9. Raise the community's awareness of the environmental aspects of water supply and sanitation through formal and informal education.
10. Emphasize environmental conservation and management, especially in the water resources sector.
11. Promote the change of water supply and sanitation development approach from administrative-based to a community-based system.
12. Improve the user community's management of water supply and sanitation facilities and services.
13. Increase the user community's awareness.
14. Apply specific efforts to target the disadvantaged people, particularly women and the poor, to achieve equity of water supply and sanitation service.
15. Develop a sound monitoring and evaluation model oriented toward meeting the set goals and objectives of water supply and sanitation facilities and services development programs.
16. Develop and disseminate performance indicators of the water supply and sanitation facilities and services development.
17. Develop monitoring and evaluation activities at four levels :
 - a. Monitoring and evaluation at the user community,
 - b. Monitoring and evaluation at the district level,
 - c. Monitoring and evaluation at the province level,
 - d. Monitoring and evaluation at the central level.

5.2 Second challenge: Securing the Food Supply

The Ministerial Declaration of The Hague signed during the Second World Water Forum identified Securing the Food Supply as one of the key global challenges in the 21st century, i.e., enhancement of food security, particularly of the poor and vulnerable, through the more efficient mobilization and use, and the more equitable allocation of water for food production. Food security exists when all people, at all time, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

Fresh water availability in adequate quantity and quality is evidently indispensable for producing land-based food, including rain fed and wholly or partially irrigated crops, in addition to fisheries and aquaculture, including riverine and coastal zone species. Trade, on the other hand, represents an alternative approach to securing food through exchanging commodities between production-rich and –poor areas. The presence of virtual water embedded in traded crops adds another dimension to the

role water plays in securing the food supply within a broader perspective encompassing both food production and trade.

For the 25 years following 1959 Indonesia was the largest rice importing country in the world. The main objective of water resources development over this 25-year period was development of self-sufficiency in rice. Water resources development activities associated with the increased rice production during this time can be categorized as: (i) rehabilitation of existing irrigation schemes; (ii) continued development of large scale irrigation projects associated with multipurpose project; (iii) development of new irrigation schemes which are categorized for construction management and budgetary purposes, as small (200 ha-2,000 Ha and large scale (above 20,000 Ha); and (iv) swamp reclamation projects to reclaim and convert swampy areas into producing agricultural areas.

The first two of the above activities are devoted solely to support of the rice crops intensification program and occur mainly in Java. The last two activities are directed at supporting both the rice crop intensification program and the transmigration program in provinces, which receive transmigrants. These transmigration projects are located throughout all 18 provinces outside Java and Bali. Transmigration (inter-island migration within Indonesia) is a national program whose objectives are to relieve uneven population distribution between the islands of Java and Bali to other islands in Indonesia, namely Sumatra, Kalimantan, Sulawesi and Irian Jaya, and to stimulate regional development in the underdeveloped areas where transmigrants are settled. In conjunction with improved agricultural policies, i.e. fertilizer subsidy, use of the high yield rice variety (HYV), etc., the various programs were very successful in terms of meeting rice demand as indicated by the fact that Indonesia actually achieved self-sufficiency in rice production in 1985. Having achieved self-sufficiency in rice production and facing budget limitation due economic crisis at the end of 1997, the Government of Indonesia (Gol) changed the emphasis of its agricultural development objectives. The new emphasis was directed at maintenance of food security in the level of food crops production by the rice intensification-extension programs together with a food diversification program to reduce the high demand for rice. Based on Law No. 7/1996 on Food, *food security* is define by a condition of fulfilment of staple foods for each house-hold which is reflected in an availability of sufficient foods in term of quantity, quality, safety as well as equitable and reachable. Within this policy special concern is given to various efforts to increase farmers income, such as "rice price policy".

Present Situation

With population of about 208 million (2000) in which their main food staple is rice, Indonesia is the third biggest rice consumer country after China and India. Despite Indonesia's remarkable achievement in reducing the population growth rate, population still continues to grow. An average rate of 1.2% will push the population level to about 250 million in 2020. This growing population will create an increasing demand for food and ever-greater pressures on land and water.

Presently total number of national rice production fluctuates in between 48 to 50 million tons of unhusked dry paddy (gabah kering giling) annually depending on the weather condition although 80% of this rice production is originating from irrigated rice fields. At this production rate, an import of rice at the rate of 1 to 3 million ton is planned annually for a buffer stock. It seems that the rate productivity of food crops, especially rice has levelled off and does not match with the increase of population growth.

Threats on Food Security

Development of national food security program is intended to enhance domestic economic power to fulfil food staples for all Indonesian citizen, especially from domestic production, in sufficient quantity and diversity, safe and reachable manner from time to time. At present not all of regions in Indonesia fulfil their own food demands. Some of foods staple still have to be imported from other places/countries. The growing population will cause national food security condition in susceptible manner since it will be more depend on other country economic policy. Two major aspects of challenges in national food security program has been identified, firstly, at macro level is to increase utilization of domestic resources and increase of national food production capacity in order to catch up with the increase of food demands in quantity, quality and its diversity, and secondly, at micro level is problems related to the high proportion of number of community that still in “food in-secure” condition due to both sudden un-expected natural disaster and chronic poverty.

Problems and challenges at macro level can be further elaborated as follows: i) food provision aspect, such as constraints national food capacity, especially rice, and high losses on production processes, ii) food distribution aspect, such as constraints on inland and inter-island transportation, iii) food consumption aspect, such as the high rate of rice consumption per capita, i.e., 135 kg/year, lack of food diversification (depend solely on rice), etc, iv) food quality and safety, i.e., pesticide contamination, etc, v) community empowerment aspect, limited access of poor community to capital and technology, etc, and vi) managerial aspect, such as limited information and data base on food security.

Constraints on Irrigated Rice Production

Given that the policy of self-sufficiency in rice production in Indonesia will be unchanged during the next twenty years, target production of rice should be set at around 70 millions tons. If rice production at 1990 i.e., 45.2 million tons is used as a base year, rice production, therefore, have to be increased by 25 million tons in 30 years. Irrigation development is expected to play a major role to overcome this issue.

However, since the last 5-7 years Indonesia has backed to become the largest importing country in the world. The causes of this declining of rice production are due to the following factors:

- *loss of Irrigated rice fields.* The conversion of irrigated rice fields to non-agricultural uses during the 90'ies (in the period of real estate booming) has reached a rate of 40,000 Ha per year. Although it decreases to a rate of 15,000 – 20,000 Ha per year in recent years due to a slow down in real estate development, it still poses threaten to the food security program.
- *most of irrigated rice fields rely on rainfall.* Among about 7.1 million ha, only around 800,000 Ha their irrigated water are supplied by reservoirs. The rest about 90% of the total irrigated rice fields are depend on *run-off river flow* type of weir which very much depend on rainfall for such relatively short typical rivers in Indonesia. On the other hand, problems of seasonal and annual variations of river flows have become worst due to degradation of watershed.
- *lack of Operation & Maintenance (O&M) Budget Allocation.* While about 80% of domestic rice production comes from irrigated areas, food security is uncertain because of problems that have constrained public irrigation performance and sustainability. Sustaining rice and food production also requires an effective

irrigation O&M program instead of deferral of routine maintenance and dependence on periodic externally aided investment for irrigation scheme rehabilitation. Currently about 50% of the total irrigation schemes required heavy maintenance and rehabilitation.

- *some of rice fields are flood prone areas.* Annually about 100,000 Ha of rice fields are flooded. It causes severe reduction of rice production to total lost of production on the affected areas.
- *water scarcity due to watersheds/river catchments degradation.* As a result of growing population pressure and changes in the nature and intensity of economic activity throughout Indonesia, issues of land and water uses have become increasingly important and have caused increase in number of degraded watersheds/river catchments overtime. Number of degraded river catchments was recorded 22 in 1984, increase to 39 in 1992 and become 59 degraded river catchments in the year of 1998. River catchments degradation has caused severe problems of unstable river flows. During the wet season river flows bring high rates of sedimentation due to excessive erosion on the upstream watershed. These cause very fast sedimentation rates on reservoirs and lakes, making the lifetimes of reservoirs shorter than planned as well as reductions on storage capacities.
- *Lack of enthusiasm of young generation on food crops farming business.* Small margin on food crops farming business and high uncertainty of net return and the existence of other alternative jobs that are more promising such as industry and urban jobs are some of factors that causes most of young generation are not interested in food crops farming business.
- *Problem of transition: irrigation management policy reform is not yet effective.* Irrigation management policy reform is a long-term program because most the program is capacity building not only for government staff but also for irrigator community organization. Effectiveness of this type of reform can be measured after 5 to 10 years of its commencement. Special efforts, especially on the operation and maintenance of trans-boundary (crossing more than one district) irrigation schemes have to be planned to make this transition period does not have detrimental effects on sustainability of irrigation schemes.
- *Low efficiency of irrigation water use.* Currently irrigation efficiency is about 30-40% this can be improved to the level of 50-60%. The saved water could be used to meet other sector demands that are also increasing.

What Is Being Done

The following activities are planned:

- Improvement the management of natural resources will be important for economic as well as environmental reasons;
- Increase of food crops productivity as well as livestock and fisheries production;
- Law enforcement to protect the existence of irrigated rice fields;
- Increase of operation and management of irrigation schemes budget allocation;
- Increase of the food crops cropping area;
- Increase of irrigation efficiency;

- Public campaign on food diversification for provincial and district government and for all level of community;
- Increase access on mechanization of farming especially for small holder farming;
- Increase the utilization of irrigation schemes, especially schemes off Java;
- Empowerment of irrigation water user organization in operation and maintenance of tertiary system;
- Implementation of national food security program based Government Regulation No 68/2002 on Food Security.

What Needs To Be Done

The following improvements in water resource and irrigation technology and management are considered the principal means of promoting the sustainability of water management and food production :

- Greater water productivity : more crop per drop that leads to more income per drop
 - a) Through better agronomic practice, which include :
 - crop variety improvement
 - crop substitution
 - improved cultural practices
 - b) Through better water management practice, which include:
 - better water management
 - deficit, supplemental, and precision irrigation
 - reallocation water from lower – to higher – value uses
- More storage : developing additional resources, which include :
 - building dams
 - recharging groundwater
 - harvesting rainwater
- Developing biotechnology for agriculture, which include :
 - raising yield ceilings
 - reducing excessive pesticide use
 - increasing the nutrient value of basic foods
 - providing farmers on less favoured lands with varieties better able to tolerate drought salinity and lack of soil nutrients
- Reforming water management institution through :
 - pricing water service
 - making managers responsive to their users
 - empowering communities, women and men
 - restructuring irrigation system management
- Supporting innovation.

In addition to water management and food production issues as explained above, the Government policies in implementing the food security program are as follows: i) shifting the focus of national food security program from aggregate food availability to household food security, ii) shifting the focus of rice based development to broad based food commodities development, and iii) shifting of effort to enhance household food reach-ability, from provision of cheap foods to increase of purchasing power.

5.3 Third challenge: Protecting the Ecosystem

Freshwater and terrestrial ecosystems are an integral part of the water cycle. They provide many valuable services—among others food production, fibre provision, world life habitats, water treatment, groundwater recharge, balancing rainwater infiltration, recreation possibilities—as well as having an intrinsic value. These ecosystems are under threat, the symptoms being species and biodiversity loss; many of the existing wetlands having already disappeared. Protection and restoration actions are needed. Their protection requires careful management of the entire ecosystem. For freshwater ecosystems, this implies integrated planning and management of all land and water use activities in the basin, from headwater forest to coastal deltas. The World Water Vision (2000) reflected this when it stated that ecosystems should be protected by integrated land and water resources management, in a river basin approach, along with full cost pricing for water services and management reforms for water delivery and wastewater disposal.

The principal “key message” of that Vision *is to preserve the ecosystem’s intrinsic values—and also its ability to continue to provide goods and services to humankind.* The need to take actions, based on an integrated water resources management (IWRM) approach, “to ensure the integrity of ecosystems through sustainable water resources management,” was also recognized in the Ministerial Declaration of the Hague Conference on Water Security in the 21st Century.

Present Situation

Issues of environmental quality and sustainability represent a relatively more recent addition to Indonesia’s development concerns. This is not surprising given the challenges that existed at the start of the First Long-Term Plan about 32 years ago, and what was known at that time about the relationship between economic activities and the underlying ecosystems upon which they depend. The growing attention to these issues in Indonesia’s development strategy is a result of the worsening environmental conditions in Indonesia today, due to the pace and pattern of growth in the past, and the increasing awareness of the costs and risks of continued environmental degradation in the future.

The development of water resources over the past 32 years – irrigation systems in particular, but also water supply systems in urban areas and hydro-electric facilities to meet the growing energy demands of the industrial sector—has played a critical role in stimulating rapid growth and reducing widespread poverty. Issues of water resources management (both quantity and quality) is increasingly important on Java and other islands off Java such Sumatera, Kalimantan, Sulawesi, etc. with different characteristics of the problems and hence approaches to be taken. Problems on Java characterized by overpopulation and natural as well water resources degradation and depletion, while islands off Java mainly characterized by natural and water resources degradation due to widespread of illegal logging and improper open mining practices and newly opened plantations on the watersheds.

On Java, the conversion of upland forests and coastal wetlands to agricultural use has led to soil erosion, watershed degradation and the loss of valuable marine resources. The rapid - but often uncoordinated - expansion of urban areas results in less-than-optimal land use densities and efficiency in the provision of infrastructure. The spread of industrial firms in and around urban areas have little regard, until recently, to their impact on the environmental or the health and welfare of surrounding communities.

Java which has 60% of the population, 70% of irrigated agriculture, and 75% of industry, issues of water quantity and quality include emerging conflicts between competing uses (agriculture, industry, and municipal), and between surface and groundwater use in rapidly growing urban areas. In the aggregate, Java is well endowed with rainfall. The problem is one of seasonal and annual variations, with dry season flow in the main rivers only 20% of annual flows—and as little as a 10% in a dry year. This is compounded by the fact that river basins on Java are relatively steep and short (less than 150 km on average) and almost all of their upper catchments are facing serious degradation, resulting in most of the wet season water running unused into the sea and very little flows during the dry season.

In the outer islands, the key issues arise from the conversion of both forestland and coastal wetlands to agricultural use (planned and unplanned, and often in an unsustainable manner), and the commercial exploitation of timber resources. Water resources issues in the outer islands mainly concern the sustainability of recently completed irrigation schemes, weirs and reservoirs, as a consequence of water resources development policies during the last 30 years. In addition of that, inappropriate reclamation methods of wetlands in Central Kalimantan for expanding rice fields to provide new settlements for transmigrants from Java have created environmentally and socially sensitive swampland development problems.

Threats on Water Availability and Sustainability

Issues of water quantity include increasing competition between alternative uses (agriculture, industry and municipal), and between surface and groundwater in rapidly growing urban areas. In the aggregate, Java is well endowed with rainfall. The problem is one of seasonal and annual variations, with dry season flow in the main rivers only 20% of annual flows, and as little as 10% in a dry year. This is compounded by the fact that river basins on Java are relatively short, resulting in most of the wet season running unused into the sea. While a number of dams have been built in major river basins such as Citarum, Brantas, Serayu-Bogowonto, Bengawan Solo and others, their reservoirs hold less than 5% of total river flows. Most of the reservoir capacities of those river basins were planned to meet the water demand for various uses up to the planning horizon of 2010. Several additional sites have been identified for possible future dams, but implementation is likely to be constrained by high population densities and the social and economic costs of resettlement.

In volume terms, water use in agriculture currently account for 95% of total demand, while industrial and municipal requirements together account for only 5%. The consumption of water by households and business will grow rapidly over the next two decades. To support continued rapid growth and improvements in human health and welfare, however, these needs will have to be met.

Currently the rate of coverage of pipe water service (from surface water) for almost all of major cities in Java is at the range of 40%-60% of total demands. The remaining is fulfilled by groundwater. The heavy reliance on groundwater to serve industrial and domestic needs in large urban areas cannot continue indefinitely. This is particularly true for the northern coastal cities of Java where groundwater is being abstracted at greater than replenishment rates, leading to saltwater intrusion and land subsidence—with attendant increases in floods and water logging which, in turn, aggravates groundwater pollution from septic tanks and leaching pits. In Jakarta the overdraft is causing land subsidence ranging from 4 to 9 cm a year, increasing the risks of flooding and threatening superstructure stability. Moreover, there is clear

evidence that the over abstraction is causing salinisation of the groundwater along the coast.

Watersheds/River Catchments Degradation

As a result of growing population pressure and changes in the nature and intensity of economic activity throughout Indonesia, issues of land and water uses have become increasingly important and have caused increase in number of degraded watersheds/river catchments overtime. Number of degraded river catchments was recorded 22 in 1984, increase to 39 in 1992 and become 59 degraded river catchments in the year of 1998.

River catchments degradation has caused severe problems of unstable river flows. During the wet season river flows bring high rates of sedimentation due to excessive erosion on the upstream watershed. These cause very fast sedimentation rates on reservoirs and lakes, making the lifetimes of reservoirs shorter than planned as well as reductions on storage capacities.

In islands outside Java, soil erosion and high fluctuation of river flows between the rainy and dry seasons due to upper watershed degradation threaten optimal functions and sustainability, which in turn results in a high cost for Operation and Maintenance (O&M) of recently completed water resources infrastructures. High sedimentation on the lower reach of river such as that has occurred in several main rivers in Kalimantan, threatening accessibility of natural harbours on the river mouth as well as inland water transportation especially during the dry season.

What needs to be done

To move from recognizing the challenge of protecting ecosystem challenge to taking the necessary action, requires that we appreciate both the intrinsic value of ecosystems and their ability to provide goods and services to humankind, and then take the needed steps to provide the required protection, including:

- Adopting a participatory ecosystem-based management (a river basin/watershed/aquifer) approach to water resources management, which provides a framework for addressing environmental needs;
- Providing ecosystem security by leaving enough water in ecosystem to both sustain them, and their ability to provide services;
- Protecting surface and groundwater from pollution by controlling of pollution and waste.

Addressing these four main issues require also the following:

- Strengthening or empowering stakeholder participation in decision making by raising awareness and capacity building;
- Developing and exchanging knowledge by using soft engineering, appropriate clean technology, indigenous crop varieties, reconsidering infrastructure and ecosystem-based management know-how, in combination with traditional and appropriate social and economic mechanisms;
- Valuing water in a way that accounts for ecosystem functions and services, and charges polluters for the full cost to the system.

What is Being Done

A number of laws, regulations and policies concerning effluent standards, water pollution control and water resource management have been released. Their enforcement, however, remains a challenging issue to be dealt with by Ramsar Convention on Wetlands. This convention came into force through the Government Regulation No. 27/1991 on Wetlands. Based on an integrated approach to watershed protection, the Ministerial Decree No. 20/2001 on the rehabilitation of forest and land was issued by the Ministry of Forestry.

In April 1999 the Gol formulated the Letter of Sector Policy and Policy Reform Matrix, which formed the basis of the on-going reforms that are addressing water resources' problems and structural deficiencies through policy, legislative and institutional adjustments. As the result of this sector reform, the Gol has issued a new Government Regulation No. 82/2001 on Water Quality Management and Water Pollution Control, which replace the Government Regulation No 20/1990 on Water Pollution Control and utilize Law No 23/1997 on Environmental Management. This new Government Regulation No. 82/2001 provides an opportunity to harmonize "water resources management" and "environmental management" since both water pollution regulation, water abstraction licensing and basin management are vested in regional governments. River basin entities may be appropriate agencies for operational water quality management tasks under agreement with provincial pollution control agencies whose primary role is regulation. To implement the Government Regulation No 82/2001, 10 Ministerial Decrees are now being formulated and to be finished by the end of March 2003.

The basin management entities may also participate in government industrial pollution abatement programs such as the PROKASIH, which aims to improve water quality by seeking pollution reduction from industries. This has been carried out in 37 watersheds in 17 provinces in 1999, up from originally 15 watersheds in 8 provinces and has involved 1,275 plants. In the next phase of PROKASIH 2005 the programme will use a more integrated approach encompassing all regions of watersheds from upstream to downstream.

As a part of water reform, Minister Coordination on Economic Affairs has issued Ministerial Decree No 15/M-EKON/12/2001 on The Direction National Water Resources Management Policy. This Ministerial Decree also set a policy direction on water resources as follows:

- To increase and restore water availability for benefits of present and future generations.
- To increase and restore water quality to fulfil water demand for present and future generations.
- To restore and maintain water resources environment bearing capacity to ensure water availability for fulfilling demands of present and future generations.

Each of policy direction has its follow-up policies and action plans.

Water Saving Campaign (Gerakan Hemat Air) The first Water Saving Campaign was introduced by the President of Indonesia in 16 October 1994 at the ceremony for commemoration World Food Day. Water Saving Campaign is one of long term efforts to manage and anticipate water scarcity that caused by in-efficient water utilization in Indonesia in these days, such as in-efficient irrigation water use, leaks in water pipe system, etc.

Water Saving Campaign will be implemented in four phases. The first phase is to make a common platform in understanding the objective of the water saving

campaign in various sectors such as industry, agriculture, housing, etc. The second phase is to make efforts such that water saving become a custom and practiced in day-to-day life of community. The third phase is to encourage community to take a greater portion in activities of water saving campaign. The fourth phase is a consolidation phase, that is the process of achieving the full development of a broader term of water saving in community. However, it seems that this campaign is not effective due to lack of follow up real actions in the fields.

What Remains To Be Done

The following discusses various efforts that will be implemented in the near future (some may on-going activities).

Integrated Catchment Management (ICM)

One of the Water Resource Reform agenda is to introduce Integrated Catchment Management as one of many efforts to maintain sustainability of water resources. In order to ensure the sustainability of the function of the catchment area, the implementation of integrated management of catchment area has to follow the principle of hydrology. In an ecology term of a catchment area, the main input component of the catchment is rainfall, while the component of output are river flows, and sediment including its nutrient and pollution components. A catchment area consists of the following interrelated components, i.e., vegetations, soils, topography, water, rivers, and people that have processor function. Therefore it is necessary that each component to be optimally in function.

Master plan of conservation of catchment area includes: i) to control land use for maintain the function of catchment are as a water infiltration area through regulation of spatial planning by allocating some open spaces for water infiltration, either naturally or man made such as a infiltration wells, ii) implementation of conservation activities on water and soil such as rehabilitation of soil (terracing, etc.), reforestation, erosion-sedimentation control, etc., and iii) monitoring and evaluation on the implementation of master plan of catchment are conservation.

Program Kali Bersih/PROKASIH (Clean River Program)

The objective of Prokasih 2005 consist of the following three main components:

- a) To increase quality of river flows.
- b) To restore function, utilization and efficiency of river environment.
- c) To increase capacity of human and institutional resources in the field of water pollution control.

Indicators of the success of Prokasih 2005 :

- i) Improvement of quality of river flows, with the following indicators:
 - Decrease of discharge of pollution loads to river flows
 - Increase of water conservation capacity, such stable river flows, small fluctuation of river flows during rainy and dry seasons.
- ii) Improvement of function, utilization and efficiency of river environment , with the following indicators:
 - Cleanliness of river area from garbage, solid waste, faecal, oil and other pollutions.
 - excessive sedimentation may cause bottlenecks and consequent floods and inundations.
 - Well function, affectivity and efficiency of river flows for public interests

- Public awareness and participation of community in river environment management.
 - Biodiversity of river environment.
 - Healthy river ecology.
 - Productivity of river environment.
- iii) Improvement of capacity of human and institutional resources in the field of water pollution control, with the following indicators:
- Establishment of required regulations.
 - Management of Prokasih
 - Working program of Prokasih
 - Affectivity and efficiency of implementation of program
 - Improvement of performance of activities, quantity as well of quality.

Prokasih is a national working program, the implementation of its activities will in related local governments (provincial, district/municipality) with special emphasis on district or municipal governments, while central sectoral institutions still will provide guidance. Since the beginning of this program in 1989 up to the fiscal year 1999/2000, Prokasih has been implemented in 17 provinces covering about 35 river basins and 77 rivers/ tributaries.

Integrated Management in Less-Developed River Basins.

In an effort to strengthen water resources management based on a river basin approach in less-developed basins, the Government is setting up basin level organizations called Balai PSDA. The roles of these Balai PSDAs are gradually strengthened in licensing of water abstraction and discharge, efficient water allocation, conjunctive use of groundwater and co-ordination with watershed management programs, in particular, cooperation with Balai Rehabilitasi Lahan Kritis/BRLKT (Critical Catchment Rehabilitation Unit) in implementing Integrated Catchment Management and Bapedalda in implementing Prokasih.

Strategic Developed River Basins.

In developed and strategic basins of national importance, the Government is strengthening various aspects of basin water resources management, water allocation and water quality, by establishing self-financing river basin management corporations that are centrally managed. Currently two basins are already managed by public corporations, i.e., Jasa Tirta I (Brantas river basin) and Jasa Tirta II (Citarum river basin) and four more basins, i.e., Bengawan Solo, Serayu-Bogowonto, JRATUNSELUNA, and Jeneberang are targeted to have such organizations, to establish financially sustainable and autonomous organizations in keeping with the tenets of the national reform. One of the tasks in the management of river basin is to cooperate in the Prokasih by providing the result of water quality monitoring to Bapedalda in related provinces and other water quality management activities. Cooperation with BRLKT in its respected areas is also important in the efforts of maintaining sustainability of catchment areas.

Water Pollution Control Framework and Institutions.

To support regional/river basin water quality management and pollution control, the government is formulating a more effective, enforceable and sustainable, regulatory and financial framework to abate river, lake and reservoir pollution by industrial and domestic urban effluents. Legal and regulatory instruments will be developed on the basis of affordable publicly accepted stream standards, river basin management needs and environmental conservation. This will enable the strengthening of water

quality management in priority river basins through investment and regulatory control of water pollution.

People's empowerment for responsible water use and conservation

Ecosystem-based catchment management can be implemented successfully when it takes a path that is based on people's well-informed decision-making, and adoption to changing conditions. This is a process that enables humans to improve their standards of living and lead their lives in dignity and fulfilment, while learning to conserve their resources base and contribute in a meaningful way to solidarity within their society.

Devolution of power to local levels, and people's participation in water management decision-making, requires individuals to take up new responsibilities and become actively involved. Water-related problems have taken a long time to reach this critical stage; persistence, tempered with patience, is needed to find solutions. Energy and capacities exist at local levels that can be complemented, where appropriate, with technical expertise by NGOs, CBOs, research institutes or governments.

Establishing Gender Equity

Gender equity in relation to water resources use and management is crucial for resolving potential water conflicts, enhancing social security, and improving strategies for water conservation, pollution control and demand management. The identification of obstacles to the broad and fair participation of women in water resources management is therefore fundamental for the implementation of sustainable and equitable resource use practices. While it is axiomatic that both women and men should have an equal right to access, around the world, women and men play different roles with regard to maintenance and use of water resources. Women often have unequal access to, control over and benefits from water resources. To establish a gender balance in water management will require substantial but subtle changes to be made to the ways that both men and women collectively manage freshwater and related ecosystems.

Raising Public Awareness

Public awareness, private sector responsibility and a general commitment among local groups to protect water resources are fundamental to establishing change. Often underestimated but potentially influential is the role of religious groups. These can provide leadership, and raise the awareness of communities and individuals of the need to protect our environment and take personal responsibility for caring for it. Community-based groups, such as service and user groups, labour unions, and women's and youth organization, also have a key role to play in stimulating changes in human behaviour to spread around the world.

Monitoring and Evaluation Mechanism

The monitoring and evaluation of national policies on integrated water resources development and management is based on Presidential Decree No. 123/2001 and implemented by the Coordinating Team for Policies Water Resources Management. The Coordination Team consists of eleven (11) inter-ministerial agencies and chaired by Minister of Coordination on Economic Affairs. At the provincial and river basin level, the implementation of policies is monitored and evaluated by Provincial Water Resources Committees and Basin Water Resources Committees, consisting of regional and local government officials representing sector interests (e.g., agriculture, forestry, environment, etc.)

In line with water sector adjustment sector program, the Coordination Team will evolve into the national apex body or National Water Council. The National Water Council will comprise of various ministers that are responsible for water resources development and management, and will include a permanent advisory group of stakeholders, NGOs and public representatives. Meanwhile, The Provincial and Basin Water Resources Committees will be transformed into Provincial and Basin Water Resources Councils. The membership of these councils will not be limited only to the local government officials representing sectoral interests, but will also cover multi-stakeholder representation.

This mechanism hopes to ensure that outputs, outcomes, and impacts of water policies are maintained in an acceptable level by providing the executing agencies with direct feed back and corrective measures. This monitoring and evaluation mechanism encourages implementation of the spirit of good governance, i.e. public accountability and transparency.

5.4 Fourth challenge: Shared Water Resources

The role of water resources in provoking conflict but also in stimulating cooperation, received high profile attention at the Second Water Forum. Sharing water resources was identified as one of the seven challenges for water management in the future:

“sharing water resources: to promote peaceful cooperation and develop synergies between different uses of water at all level, whenever possible, within and, in the case of boundary and trans-boundary water resources, between states concerned, through sustainable river basin management or other appropriate approaches” (The Hague Ministerial Declaration, March 2000).

Sharing water means sharing water among uses and sharing water among users. The World Water Vision has pointed out how population growth and development are increasing the pressure on available water resources. Intensive human use of water has already led to social and environmental damage that is not always reversible. It has become clear that water is a finite, and often scarce resource. A situation where anybody can draw on the available water, without limit, is not sustainable, because it leads to depletion of the resource. Therefore, the principle that a cooperative attitude toward water is necessary to preserve the resource has been promoted and widely acknowledged now by professionals and politicians at different levels. Tradeoffs between different uses of water and dialogue between users are both necessary to preserve water for the future.

This principle is not new: it has existed for long period at community level in many traditional societies, such “*Subak*” in Bali, Indonesia. However, now water is rarely managed at the community level. Decisions and actions at local level, national level and international level, be it by the public sector, the private sector or civil society, are all inter-related and impact our water resources.

The World Water Council (WWC) in its report on the World Water Actions has pointed out that “*sharing water resources among uses*”, should be understood in the broadest sense: water not only has uses, but functions and values. All of these need to be understood and repeated, together with a sector-wide acquiescence not only to share the resource on a quantitative basis, but also share the values that are not

linked to water quantity. Therefore, the WWC 's report broadens the definition of the challenge to “*sharing water among functions and values*”.

The challenge of “sharing water”, as it is expressed in the Ministerial Declaration, comes very close to the challenge of implementing Integrated Water Resources Management. The Global Water Partnership 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 (GWP, 2000)*”.

Present Situation

As mentioned in Chapter 2, Indonesia has formulated its Water Vision in the 21st Century, the main consideration of the vision formulation are as follows:

- That the water is an invaluable gift from the Almighty God that should be gratefully managed in order to attain a meaningful life and a living in accordance with the dignity of human and other living organisms, respecting natural ecosystem and the environment. Our precious water resources must be recognized as a basic need for the people.
- That water is highly necessary to be utilized wisely in attempting to actualise the appropriateness of its functions; and it needs to be managed properly and wisely as well as to be maintained and sustained in order to assure its optimum functions.

As mentioned in Chapter 4, the National Water Resources Management Policy would include: introduction of a water rights framework for water allocation and utilization conducive to economic and social development and environmental sustainability. This enabling framework has been included in the draft new law of water resources management. In this framework, the water use right is directly given for basic human needs, while for the water use right have to requested by the user for a commercial use of water. The water use right for commercial user will be given in the form of a certificate after fulfil a set of requirements.

What Is Being Done

At the same time of the Second World Water Forum in 2000, many countries including Indonesia has already progressed some distance in implementing approaches for sharing water resources, including decentralized and participatory water management (please refer to Chapter 4, Indonesian Water Resources Policy Reform). The main approaches in Indonesia for sharing water can be summarized as follows:

- *Regulation for water allocation.* Existing law and government regulations are being amended to accommodate new paradigms in water resources management, such as decentralization to local governments and river basin entities and increase participation of beneficiaries;
- *State large water infrastructure projects and water allocation decisions.* Indonesia have launched large water infrastructure projects in 11 (eleven) major river basins (refer to Chapter 3, Water Resources in Indonesia), such as multipurpose dams or inter-basin transfer, or have decided on re-allocation of water resources among sectors;
- *Water use right.* Indonesia has included enabling framework for Water Use Right in the draft of new water resources management law.
- *Decentralized and negotiated approaches to water management.* More recently, negotiated and participatory approaches in water management,

mostly at a local level, have been established either in a “top-down” way by states, or have emerged from the “bottom-up,” when local actors have decided to solve problems around shared resource.

What Remains to Be Done

The actions show the importance of having neutral organizations that can play a role in catalysing change and providing mediation and arbitration in water management at all levels. In Indonesia the proposed National Water Resources Council, Provincial Water Resources Council and River Basin Water Resources Council in which their member consist of all major component of water resources multi-stakeholders may be an appropriate neutral organizations at the level of national, provincial and river basin. Implementation and strengthening of such organizations should continue at all levels.

The establishment of basin council/committees or discussion platforms around water issues does not in itself ensure better water management. Having all stakeholders around a table does not lead directly to collaborative agreements or decisions. This challenge is important for the promising dialogues and partnership that are currently being established around the world. First, the role of a neutral organization seems essential. The capacity of water managers to perform such a role should be strengthened. Then, all stakeholders participating in the process should be trained in negotiation and conflict resolution.

Decision support techniques and cost-benefit analysis have to be used to assess and choose the most appropriate water management strategies for the future. Existing research on ways to share water benefits should be made more readily available to water managers. In general, the gap between research on “how to manage water” and water management practice could be narrowed. Above all, and at all levels, when creating basin management institutions, it is necessary to ensure mechanisms for financing, executing and enforcing the decisions that are being made. The following is the list of actions that still needed in Indonesia:

- Many action still need to be undertaken in the field of enabling, stimulating and establishing multi-stakeholder dialogues around water;
- Efforts need to be made to improve the institutional system (mainly the establishment of river basin organizations);
- Many networks still to be set up for knowledge sharing, and this is especially important in the trans-boundary/international cases;
- Efforts to raise awareness about the importance of sharing water need to be continued.

5.5 Fifth challenge: Managing Risks

The main water related risks are floods, drought and water pollution. There is clear evidence of rising trend of natural disasters, a large proportion of which are hydro-meteorological. In the period 1990-2001, 2200 major water related disasters were recorded world wide—50% of these caused by floods, 28% were attributed to water related disease, and 11% to droughts. During this period, 90% of all death from all natural disasters was water related.

There is a clear need to recognize the extent of risk from the hazard involved and respond to minimize the impacts, which bear most heavily on the lower income countries and disproportionately affect the poor, who live in the more marginal areas

where the risks are greatest. It is clear from the actions recorded that not enough is being done. Part of the problem is that risk reduction is seen largely as a technical problem, and there is failure to realize the economic benefits of hazard reduction, including the loss of investment potential where risks remain high. There is also a lack of preparedness for disasters.

Present Situation

“Managing Risks” is a challenge, which received greater attention since the Ministerial Conference of The Hague. Similar attention also received in the September 2000 UN Millennium Declaration and the International Conference on Freshwater in Bonn, 2001, in which positions “Managing Risks to cope with variability and climate change” in one of Actions in the Field of Governance. During the World Summit on Sustainable Development in Johannesburg, 2002, the Plan of Implementation recognized: “An integrated, multi-hazard, inclusive approach to address vulnerability, risk assessment and disaster management as an essential element of a safer world in the 21st Century”.

The major development challenge of the 21st century in Indonesia is the alleviation of poverty. While people with sufficient resources can protect themselves, the poor are the most exposed to disaster and at risk of losing their properties, and even their lives, as well as lacking the resources needed for post-disaster rehabilitation. In their quest for jobs and incomes, the poor tend to settle in the vulnerable areas, alongside rivers, on hillsides etc, close to the city, without sufficient precaution from hazards, even though government policy tries to relocate them. In addition they depend heavily on natural resources, which make them even more vulnerable to hazards. Given the size of the problem, it is no surprise that disaster reduction has become one of the key issues in poverty alleviation.

In addition to the natural water-related hazards described earlier: floods, droughts, landslides, typhoons, there are also human-induced hazards either accidental or intentional: water pollutions, the negative effects of infrastructure due to inadequate design or operation/management, etc. The impacts of hazards can be examined from social, economic, and environmental points of view. Social impacts are direct: for example, mortality, and the destruction of infrastructures. Economic impacts include the damage to assets and properties, and negative impacts on the stock market prices within and outside of the affected areas due to damage to industry and agriculture. Environment impacts are relatively direct, and sometimes the impact on the environment and on ecosystems will last long for decades or even centuries. Water pollution, in the form of discharged heavy metals or organic chemicals, accidentally or deliberately, causes serious long-term damage to all kinds of water bodies. If trapped in sediments, e.g. downstream of large rivers, at sea ports etc, it constitutes a serious and costly problem to remedy.

What Needs To Be Done

Looking at the broader issue of risk management, there are essentially three main components of this a) the assessment of risk, b) the implementation of better structural and non-structural measures to reduce risks, and c) risk sharing, via insurance program and other risk transfer mechanisms. These three main categories are further subdivided in the paragraph below.

In the specific case of *floods*, the hazard potential is related to the magnitude of the flood and the frequency of occurrence. Increasingly, it is now possible to predict those floods in real time, although the capacity for this is not as great in lower income countries than in advanced ones. As indicated earlier, the available mitigation include a) structural ones—such as levees, dykes, flood control dams etc, b) non-structural ones—land use planning, flood forecasting, flood emergency response plans and many others. On the other hand, it has to be recognized that floods bring benefits also, in the form of nutrients for floods plains, their importance to certain aquatic species. Thus management of floodwaters has to balance these sometimes conflicting demands.

With *droughts*, the onset of them is generally slow and they are associated with significant human and socio-economic losses. It is claimed that they are generally the result of lack of distribution arrangements and organizational capacity, know how and human and capital resources in poorer regions. A range of short-term response is available. These can include changing land use practices, irrigation from reservoir or aquifers, crop insurance schemes, relief program, protecting priority users, and others. For the longer term, measures can include changing crops types, building storage reservoirs, building security at both local and family level, etc. In recent year, we have seen marked improvement in seasonal and long term climate prediction, which greatly improves drought management practices.

What is Being Done

The following is the comprehensive policy to mitigate flood hazard adopted in Indonesia:

1. *Land use (spatial) planning*: to revitalize and operationally land use (spatial) plan such as inventory of land use changes that cause floods, review of existing land use (spatial) planning; to support revision of land use planning that minimize run-off; and to control land use in order to minimize run-off;
2. *Integrated water resources management*: flood control measures have to implemented base on the unity of a river basin ecosystem from the spring down to river mouth based on *one river one integrated plan and one coordinated management*. The flood control measures shall consist of structural and non-structural measures with special concern to preparedness and self-reliance of community at large and to protect residential areas, industrial areas and agricultural areas, etc from flood hazard;
3. *Provision of adequate urban-rural infrastructure*: to provide sufficient urban and rural drainages as well as waste water and solid waste management;
4. *Provision low price housing*: to resettle poor people that live in riverside areas and hill sides that vulnerable to flood hazard and landslide;
5. *Community service and empowerment of society*: provision early flood warning system and hazard mapping and risks guides, raising awareness, campaign, capacity building, education and training, etc.

Indonesian Policy and Strategy on Disaster Mitigation

- a. In any disaster mitigation measures and refugee management there must be the same perception among all parties concerned from government institution as well as from community. All efforts and measures have to be based on general

guideline, manual and permanent procedure that issued by related institutions in accordance to their competence.

- b. Disaster mitigation efforts and refugee management are implemented in integrated and coordinated manner involving all government and community potentials. The efforts and measures previously mentioned are implemented before, during and after disaster, which are materialized in preventive, repressive and rehabilitative/recovery manners.
- c. Disaster mitigation measures and refugee management is one of the government duties, therefore it must be implemented by government together with all private sectors concerned and community at larges by empowering facilities and infrastructures that are available and to put the government as a facilitator and pose the main responsible institution.
- d. Policies of Disaster mitigation measures and refugee management are formulated and issued by National Board of Coordination for Disaster and Refugee Management (BAKORNAS PBP)

Strategy

1. In the prevention stage, efforts are mainly focused on prevention measures such that damages and victims are kept at minimum level during disaster.
2. In the emergency stage, efforts are focused on search and rescue measures and evacuation as well as emergency supports such as temporary shelters, food supplies and medical service for disaster victims.
3. In the rehabilitation stage, efforts are directed to rehabilitate any damages on physical and non-physical matters caused by floods as well as community empowerment and to recover the strength of victims.
4. In reconstruction stage, efforts are directed towards reconstruction of public infrastructure and facilities.

What Remains To Be Done

An integrated, multi-hazard, inclusive approach to address vulnerability, risk assessment and disaster management, including prevention, mitigation, preparedness, response and recovery, is an essential element of a safer world in the twenty-first century. Action required at all levels to:

- a) Strengthen the role of the National Strategy for Disaster Reduction and encourage the international community to provide the necessary financial resources to its Trust Fund;
- b) Support the establishment of effective national and provincial strategies and scientific and technical institutional support for disaster management;
- c) Strengthen the institutional capacities of national and provincial institutions and take an active role in international joint observation and research, through improved surface-based monitoring and increased use of satellite data, dissemination of technical and scientific knowledge, and provision of assistance to vulnerable countries;
- d) Reduce the risks of flooding and drought in vulnerable areas by, inter alia promoting wetland and watershed protection and restoration, improved land-use planning, improving and applying more widely techniques and methodologies for

- assessing the potential adverse effects of climate change on wetlands and, as appropriate, assisting countries that are particularly vulnerable to those effects;
- e) Improve technique and methodologies for assessing the effects of climate change, and encourage the continuing assessment of those adverse effects by the Intergovernmental Panel on Climate Change;
 - f) Encourage the dissemination and use of traditional and indigenous knowledge to mitigate the impact of disasters; and promote community-based disaster management planning by local authorities, including through training activities and raising public awareness;
 - g) Support the ongoing voluntary contribution of, as appropriate, non-governmental organizations, the scientific community and other partners in the management of natural disasters according to agreed, relevant guidelines;
 - h) Develop and strengthen early warning systems and information networks in disaster management, consistent with the International Strategy for Disaster Reduction;
 - i) Develop and strengthen capacity at all levels to collect and disseminate scientific and technical information, including the improvement of early warning systems for predicting extreme weather events, especially El Nino/La Nina, through the provision of assistance to institutions devoted to addressing such events, including the international Centre for Study of the El Nino phenomenon;
 - j) Promote cooperation for the prevention and mitigation of, preparedness for, response to and recovery from major technological and other disasters with an adverse impact on the environment in order to enhance the capabilities of affected countries to cope with such situations.

5.6 Sixth challenge: Valuing the Water

Valuing Water *“to manage water in a way that reflects its economic, social, environmental and cultural values for all its uses, and to move towards pricing water services to reflect the cost of their provision. This approach should take account of the need for equity and the basic needs of the poor and the vulnerable”* (The Hague Ministerial Declaration, March 2000).

The values of water are not purely economic ones, but include also support to human life, environmental values, social values and cultural (including religious) values. Different people view these various values in different ways. The economic approaches to water value are tools to be used in conjunction with the other values. Indeed, investments made on the purely economic value of water can show low and slow returns. Some see water investments as hard to justify, despite clear evidence of how they are a key ingredient of poverty alleviation and the promotion of economic growth. So there have been signs of lower investment in water (indeed some disinvestments) and show take –up of available investment funds, in part this reflect the lack of understanding of the crucial role of good water supply and the many uses and values of water, including the crucial services provided by well functioning ecosystems.

Traditional economists focus on the direct, commercial or marketed values associated with water. The decisions are made on the basis of this direct value, ignoring environmental, social and cultural values. Consequently water investments are difficult to justify in financial terms. Currently not many project are presented for financing. Instead of rising, water investments have been declining for 20 years; in fact we are today disinvesting from water. This change in the trend has to be worked out recognizing that whatever the source tapped, the schemes and the philosophy behind, money has to come from one of the three sources:

- Water users through prices and water-based taxes
- Country citizen through general taxes and government taxes.
- World citizens through development funds.
-

Water awareness is improving on the international scene, with some visibility for water in the World Summit on Sustainable Development 2002, and at individual and community levels, but it remains insufficient at the intermediate level, especially the national level. Furthermore at all levels its value as a basis for human life, economic development, livelihood improvement and poverty alleviation, health and ecosystem deserves much more—in terms of awareness and in terms of tangible actions.

Present Situation

Existing Law No 11/1974 on Water Resources stipulates that in principle water users or beneficiaries should bear cost of water service they rendered. More recently Government Regulation No 77/2001 on Irrigation stipulates that Water User Association (WUA) has an authority, duty and responsibility in operation and maintenance (O&M) of irrigation schemes on its jurisdiction area. In principle management of irrigation schemes (consisting O&M and rehabilitation activities) is funded by WUA/Federation of WUA (FWUA)/Central WUA (CWUA) through contribution of their members. While local government (especially district level) has responsibility to help and facilitating the WUA/FWUA/CWUA.

However, in reality, up to this time Government and Local Government (provincial and district levels) still bear all cost (O&M and investment costs) of public irrigation schemes (about 6.5 million Ha). About Rp. 350 billion (US \$ 40 million) is allocated annually for O&M of public irrigation schemes. While water users of domestic and industry and other uses (including for electricity) pay for water service they rendered that includes O&M cost and part of investment recovery.

As mentioned in Chapter 4 Indonesia Water Resources Policy Reform, reform activities are on-going for improving cost burden sharing in government side by amending law and regulation on water resources infrastructures management.

What needs to be done

The following actions are planned to be carried out in improving water resources and irrigation management performance on fiscal sustainability aspects:

- a) *Water Resources Management*. Initiate a program for achieving sector fiscal sustainability by: (i) establishing new mechanisms to increase cost recovery for water services and reduce the fiscal burden of infrastructure maintenance; (ii) using economic instruments to cover costs of water quality monitoring and construction of wastewater treatment facilities; (iii) use of cost-effective criteria and cost accounting in agency programming and budgeting; and (iv) improving the revenue of River Basin Corporations from their water service.
- b) *Irrigation Scheme Management*. Achieving fiscal sustainability in irrigation financing by: (i) transfer of canal network maintenance responsibility to FWUAs; (ii) establishing Kabupaten Irrigation Improvement Funds (KIIFs) for rehabilitation of canals under FWUA management and based on matching contribution from FWUA members; and (iii) requiring matching contributions from FWUAs to obtain O&M grants from Kabupaten governments.

What Is Being Done

As mentioned in Chapter 2, Indonesia has formulated its Water Vision in the 21st Century, the main consideration of the vision formulation are:

- *water is an invaluable gift* from the Almighty God that should be gratefully managed in order to attain a meaningful life and a living in accordance with the dignity of human and other living organisms, respecting natural ecosystem and the environment. Our precious water resources must be recognized as a basic need for the people. Management of this resource should aim at an optimal contribution to the prosperity of the people;
 - Accordingly, water is considered as the gift of God, The Creator, and therefore not subject to any form of taxation;
 - Nevertheless, those who receive benefit and/or enjoying both the tangible and the intangible benefits from the efforts of providing water, should contribute fees adequate for remunerating the operation and maintenance costs and capital charge of the water resources infrastructures to be functioned on sustainable basis.
- That the water is not an unlimited natural resource, despite its natural recycling capacities. It is therefore imperative to sustain and reinforce our efforts so as to be able to maintain, preserve and develop this resource in a balanced way. A consistent educational program, starting from childhood, should contribute to raising the awareness of each individual concerning the need for sustainable use of our water resources.

To improve public irrigation network sustainability without increase fiscal burden to government, the President of Indonesia has issued a public Declaration of Irrigation Management Policy Reform (DIMPR) on April 13, 1999 signalling the government intention to implement an effective policy of participatory irrigation management. System-level federations of WUA (FWUA) will have the right to request, prioritise and control the quality of all infrastructure repair and development activities as part of the empowerment policy. While the full transfer of irrigation responsibilities to regional governments will also require allocation of adequate O&M funding from central government for the irrigation head works, main canals and large secondary canals of schemes which remain a government responsibility, such schemes may be jointly managed by District Government and WUAs.

The principle of beneficiary contribution towards the government costs of public water supply and irrigation services and other uses, and the principle of "Polluters Pays" are reinforced and institutionalised through preparing legal, institutional and managerial frameworks. Currently four strategic river basins (Bengawan Solo, Jeneberang, Jratunseluna, and Serayu-Bogowonto) are targeted to be managed by public owned corporations.

What Remains to Be Done

Promotion of the Global value of water approach: Formulation of universally agreed principles, which reflect the accepted universal values of water should be considered. These principles would be converted into benchmark, to be used in all aspects of water management, including infrastructure development. This approach would recognize the cultural diversity of nations but at the same time, acknowledge a

common set of values, which could be applied worldwide. It would overcome a great deal of the present opposition to the application of the economic principles for water, established in the 1992 Dublin Conference on Water and the Environment. The following actions are important to be considered.

- a. Promotion of the “global value” approach and implementation
 - Reduplicate the actions to raise awareness of all stakeholders: communities and individuals, schoolchildren and teachers, industrial and agricultural consumers, decision makers, etc.
 - Disseminate the concepts of global value and train local professionals in their use so that decision making widely uses these tools.
 - Set up legislative and institutional frameworks, which acknowledge these concepts and allow for their effective use.
- b. Recognition of environmental value
 - Get national policies towards recognition of environmental value
 - Evaluate environmental value as a tool for decision making every time a choice on ecosystem management can be affected by the result of this value; consider direct benefits as well as indirect ones, and consider intrinsic ones only if needed for decision.
- c. Recognition of social value: the social value both the benefits of water and sanitation to public health, to poverty alleviation and livelihood, to gender issues, and all impacts, both negative and positive.
- d. Recognition of cultural value
 - Prioritise protection and rehabilitation of water bodies which have a cultural importance,
 - Recognize rights of indigenous people and give them a fair share in the management of water resources.
- e. Economic approach
 - Introduce the above considerations in an economic approach of water projects
 - Use economic tools as incentives for water wise behaviours. Prioritise demand management above supply-driven approaches
 - Decide on water policies and projects according to the value frame; then set up funding to cover water costs in a clear and transparent way that takes in account the weaker and speechless users, such as the indigenous, the poor, the environment.

5.7 Seventh challenge: governing water wisely

It is said that the real crisis in water is a crisis of governance. As yet there is no widely agreed definition but there are generally acceptable descriptions. Governance in general comprises the body of policies, rules and practical procedures that recognize and set out the specific roles and responsibilities of different stakeholders—in the case of water, the community, the private sector, the public sector and the individual. A governance structure comprises the mechanism, processes and institutions via which members of the public, as well as groups, indicate their interests and exercise their rights, as well as meet their obligations and find ways to resolve their differences. Bringing this system that are put in place to

allocate, develop and manage water resources and the delivery of water services for any society.

Developing countries including Indonesia must simultaneously address their need for major reform of their water resource management institutions and develop and maintain an appropriate stock of large and small infrastructure, at a time of rising costs. They are under pressure internally (economy, population, declining resources, political pressure) and externally from bilateral and multi-organization and NGOs, as well as the time pressures of meeting The Millennium Development Goals. The government is tasked with creating the enabling environment to permit holistic, integrated management of water, with stakeholder participation and decentralization of water management. The role of government is not necessarily to manage the provision of the different water service, but to regulate the activities of those who do provide them.

Reform of this magnitude is not easy. International agencies have important roles to play in assisting reforming governments. However reform is under way and many actions have been taken.

Present Situation

Many of the problems in the water sector arise from poor governance. These include:

- A lack of integration of sectoral government ministries and institutions responsible for management of the different components of the water sector in a sustainable way;
- Lack of a shared vision for water, allied to poor understanding of the limiting factors which impede water development;
- Insufficient political and public awareness;
- Shortage of capacity to meet demand effectively, both in terms of resources management and service delivery;
- Upstream/downstream conflicting interests;
- inefficiency and low productivity in the use of water, and wastage of water.
- Lack of locally relevant legislation and water rights and entitlements;
- Failure to recognize the potential of water resources development (plus good water supply and sanitation provision to foster sustainable economic growth and poverty alleviation);
- Failure to recognize the drain on economic productivity caused by the burden of mortality associated with water related disease due to lack of safe water supply and sanitation.

Needs for legal adjustment

Although the existing water law (UU No. 11/1974) has provided significant contribution to the development and management of water resources, however, it needs to be adjusted to cope with recent problems and the emerge of new paradigms in water resources management such as:

- Need for balance between water exploitation and conservation;
- Need for strong coordination to among the related sector to enhance integrated water resources management;
- Need for balance approach, i.e., structural as well as non-structural ones;
- Need for role sharing between central and local governments;
- Need for democratisation and transparency;
- Need to accommodate role of community and private sectors;

- Need to accommodate paradigm shift such as autonomy; human right; good governance, etc

What Needs To Be Done

In general to improve water governance, it needs to balance social pressures with economic demands and environmental needs. This involves managing risks, promoting awareness and understanding, and mobilizing the political will to make decisions and see them through to implementation. It means acknowledging the potential of, and moving then towards the provision of the necessary water infrastructure, recognizing that it can be the basis for sustainable economic growth and poverty alleviation. A well-structured system would include all of the following policy elements:

- Effective water policies and action program in all countries, the formulation of these being by the stakeholders concerned, both government and non-government interests;
- Establishment of a coordination mechanism, which could be a national representative apex body, such as a national water council or commission, to oversee the sector reform process and to improve coordination, including the creation and supervision of river basin organizations with stakeholders participation;
- Measures to improve water service delivery through autonomous and accountable providers;
- Measures to foster the efficient and sustainable use and conservation of water;
- Provision for the mutually beneficial use of shared water resources;
- Improved governance through capacity building, learning and evaluation.

Underlying this structure are several important principles:

- *Accountability* is needed in the performance of water service providers and in resources management and conservation, including the allocation of water to high value uses, to the poor and vulnerable groups, and for ecosystem management;
- *Participatory* development approaches, involving public, private, community and NGO stakeholders, are essential, as is recognition of the key issue and the full participation of women;
- *Predictability* refers to the existence of laws, regulations and policies to regulate water sector activities, and their fair and consistent application;
- *Transparency* the timely availability of information about water policies and projects to the general public, and clarity about government rules, regulations and decisions in the sector;
- However, even with best of all the above, it requires *reasonably functioning* political system to make it all work.

To reach the optimum governance structure, attention to a range of issues is essential, including:

- *The institutional framework*-the definition and establishment of laws, rights and licenses. The responsibilities of the different actors in the sector have to be set out. Standards are needed: for water quality and service provision (especially for the poor), for the environment, for land use management, and for the construction and management of infrastructure which will affect the quality and quantity of water resources.

- *The management instruments* -which include the regulatory arrangements- investment in regulation is as important as investment in infrastructure. Standard and plans are required, as well as effective mechanisms for stakeholders; knowledge and information systems that increase transparency, motivate effective water allocation, use and conservation, are needed, which also secure the maintenance and physical sustainability of the water resources systems;
- *The development and management of infrastructure*—for annual and multi-year flow regulation for floods and droughts, multi-purpose storage and for water quality and source protection; in addition, for the distribution of water supply to communities and to irrigators and the collection and treatment of wastes and the management of urban storm water;
- *The political economy of water management and reform*, in which there is particular emphasis on the distribution of benefits and costs and on the incentives which encourage or constraint the more productive and sustainable resource use;
- *Decentralization/subsidiarity*—in view of these past failures of a centralized government approach to water management, decentralization of management is essential, within the enabling environment created by governments. The principle of subsidiarity should apply, involving the delegation of responsibility and authority for water management from governments, down the line, to the lowest level of organization with the capacity and resources to cope, including having sufficient credibility to borrow funds.

What Is Being Done

As mentioned in Chapter 4, in April 1999 the Gol formulated the Letter of Sector Policy and Policy Reform Matrix, which formed the basis of the on-going reforms and the new water resources management paradigm that are addressing water resources problems and structural deficiencies through policy, legislative and institutional adjustments. In summary the new water resources management paradigm are as follows:

- The new paradigm in water resources management is consistent with the principles of the 1992 UN Dublin Water Conference in which transforms the investment- focused in “supply-side” approach of full government control, to a more modern and sustainable “demand-side” approach.
- The principles are:
 - Water has an economic value and should be managed as an economic goods
 - Planning and management should take place at the lowest appropriate (administrative) level through a participatory approach
 - Being a finite and vulnerable resource, water should be managed in an integrated manner.
- The new paradigm shifts emphasis from investment-based projects to institutional development. Investment project, thus, becomes structural components of longer terms programs.

- The ultimate outcome of the reform program should be a “capable” institutional framework which draws its enhanced performance from :
 - Better sector governance with greater transparency and accountability in decision-making through stakeholder participation at local levels;
 - Public as well as inter-agency consultation
 - Improved public expenditure management by introducing economic and financial considerations for investment decisions and water allocation, and enhancing cost recovery.

- A revised water resources law and comprehensive water quantity and quality management regulations will realize the improved participatory, governance and expenditure goals in the following ways:
 - A National Water Council composed of sector ministers and non-governmental stakeholder members will be established, while provincial and river basin water resources councils will be established locally. The councils will set policies for water allocation, conjunctive use, monitoring and evaluation, water quality management, management of flood and drought contingencies, and investment planning.
 - A framework will be established for water allocation based on private and sub-sector water rights for consumptive and non-consumptive water uses.
 - River basin agency will implement these policies on basin scale – in the form of corporations in highly developed basins and governmental basin management units in less-developed basins.
 - Provision of improved framework for water pollution control and water quality management based on new economic regulatory instruments.
 - Establishment of decision-support system based on linked inter-agency data networks, a national institution to ensure the integrity and reliability of hydrological data, and national water quality monitoring network.

What Remains To Be Done

It is clear that significant progress is being made to create enabling environments. However, progress is slow, compared with the size of the task of meeting the Millennium Development Goals. Thus there is the need to speed up the pace of reform. Much more effort is needed too in management actions to combat the problems of water related diseases. There remains the need for substantial institutional strengthening and capacity building, among others is the following long-term goals of capacity building process:

- a. *more sustainable, transparent and equitable inter and intra-sector water allocation and management* through a water use rights system, conjunctive use of groundwater, prioritised rehabilitation of river infrastructure and, reliable river discharge and water use management;
- b. *improving governance and accountability in national and regional water resources management* through strengthening institutions for stakeholder involvement;
- c. *creating rural social capital through capacity-building of empowered community irrigation organizations and village-level credit units* based on farmer membership of these organizations;
- d. *promoting rural development by raising farm family incomes in program district/kabupaten* through sustainable irrigation services support by demand

driven “open-menu” credit access and agricultural support programs to raise the productivity and value of irrigated crops;

- e. *improving sector management by strengthening mechanisms for discharging of agency mandates and their fiduciary responsibilities* through the cost effective raising awareness in programming and budgeting, building regional capacity for sector and basin planning, use of management controls based on asset management, cost accounting and quality assurance procedures;
- f. *conserving surface and groundwater on a basin-wide scale* through better water quality management based on licensing of water abstraction and wastewater discharge, economic regulatory mechanisms for water pollution control and, reliable monitoring of wastewater discharges and river water quality.
- g. *Improved fiscal sustainability of water resources and irrigation management* by: (i) introduction of more efficient service charges and cost recovery mechanisms to reduce the O&M burden of river infrastructure; (ii) reducing the fiscal burden of public irrigation expenditures by requiring significant WUAF matching contributions for receipt of Kabupaten Irrigation Sector Fund (KIIF) and O&M budget sharing assistance; and (iii) reducing the number of agency surplus staff within the context of civil reform.
- h. *Promoting corporation of government water service* by: (i) ensuring that new River Basin Corporation have adequate revenue to cover the cost of more efficient service provision, (ii) supporting organization for corporate management of provincial water services, and (iii) greater involvement of the private sector in sector activities and services.

6 Portfolio of Water Actions

6.1 Background

The Portfolio of Water Actions (PWA) is a compilation of the statements of actions to be taken voluntarily that are submitted by various national governments and international organizations. It consist of the document with a specific emphasis on what outcomes are either expected or desired to achieve the goals outlined in the UN Millennium Development Goals, and the WSSD Implementation plan. In this document, the details content such as Who, What, When, Where, Why and How as well as specific outcomes with particular concern for “what actual contribution to the solution of water issues” to be achieved, will be clarified.

The PWAs is expected to contribute to the creation of political momentum leading to steady implementation and to the establishment of new avenues for coordination among implementing bodies by having countries and international organizations reaffirm future actions to be undertaken, take initiatives to create action plans and bring these together and announce them in PWAs. For Indonesia, PWAs is also a media to propose a debt swap scheme for natural resource and poverty alleviation and also partnership scheme by NGO, i.e., Indonesian Water Partnership to Indonesian development partners.

6.2 Indonesian Portfolio of Water Actions

Water is a resource with strongly regional characteristics and water issues contain many problems that are crosscutting across various specific fields. Therefore, action toward the resolution for water will require systematic coordination among various sectors and will need to be actively linked to the plans, initiatives and proposals of various regions. To address and compose Indonesian Portfolio of Water Action several inter-sectoral meetings and culminated by a water resource stakeholders workshop organized by Ministry of Settlement and Regional Infrastructure and Bappenas (National Development Planning Agency) were conducted. Various water programs and actions (11 programs/actions, shown in Table 6.1 to Table 6.11 in the attachment), partnership scheme (1 action, shown in Table 6.12), and debt swap schemes (13 proposals, shown in Table 6.13) , which related to water are categorized in the followings themes:

1. Water and sanitation;
2. Water for food and rural development;
3. Water pollution prevention and ecosystem conservation;
4. Disaster mitigation and risk management; and,
5. Water resources management and benefit sharing.

6.3 Debt Swap Scheme

As one of the Agenda 21, a program of action adopted by the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in June 1992, provides: “*Various forms of debt relief and greater use of debt swaps are required to finance implementation of sustainable development.*” In this regards, Indonesia’s poverty alleviation strategy and natural resources protection and conservation programs are concrete expression of sustainable, long-term economic empowerment of not only society’s poorest, but society as a whole, because the strategy includes improvement in agricultural productivity and reduced inflows from rural to urban centres. For this reason and also to relief the Gol’s debt burden, the Indonesian government intends to negotiate with the respective foreign government on the terms of debt relief, including provision for counterpart fund, which is essentially a conversion of part of Indonesia external, foreign currency-denominated debt into Rupiah (local currency).

The World Summit on Sustainable Development (WSSD) in Johannesburg September 2002 also outlined the importance of water through its protecting and managing the natural base resources of economic and social development, which also restated the importance of achieving the millennium development goals on reaching or affording safe drinking water and the access to basic sanitation. In line with this statement, the Government of Indonesia proposed 13 (thirteen) projects for debt swap as shown in the attachment (shown in Table 13) that stressed on the important of sustainable development based on economic, environment and social aspects. Further, Indonesia considers that the 3rd World Water Forum, here in Kyoto, is suitable occasion to remind the Indonesian development partners on the United Nation Resolution 55 / 1996 that encourage all Member States, the United Nation system, and all other actor to take advantage to increase awareness of importance of freshwater and to promote action at the local, national, regional, and international level (Para 4 of the resolution) by taking into consideration a debt swaps for Indonesia.

6.4 Water and Sanitation

Key Issues

In principle the Gol and all stakeholders agreed on the UN Millennium Development Goals (MDGs) to halve the proportion of people without access to safe drinking water by 2015. They also agreed to the Plan of Implementation of the World Summit on Sustainable Development (WSSD) to halve the proportion of people without access to basic sanitation by 2015.

Policies

In principle, the aim of the Water supply and Sanitation (WSS) program is to improve the quality of life of the community. It is expected that through the improvement in the services of WSS infrastructure and facilities, the health condition, and subsequently the productivity and the quality of life of the community, could be improved as well.

- i) *Water as an Economic and Public Good* . Until now, most communities perceive water as a public good to be obtained and used at no cost. This belief has led to the lack of the community's attention to the sustainability of water resources, both quantitatively and qualitatively, resulting in the excessive exploitation and use of water resources capacity. The principle of WSS service as an economic good is that the user pays for that service. The old believe that water is God given and therefore requires no payment is invalidated; what the user has to pay is the value of the convenience he or she receives. It is also inclusive in this principle that the user's willingness to pay is the backbone of sustainable WSS facilities and services.
- ii) *Informed Choice as the Basis for Demand-Responsive Approach*. The demand-responsive approach places the community as the decision-makers. To increase the effectiveness of this approach, the community should be provided with informed choices to develop and construct sound WSS facilities and services with respect to the local financial, technical, and institutional aspects.
- iii) *Environmental-Friendly Development*. Sustained, environmental-friendly development is a consciously, well-planned development effort integrating the environmental aspect, namely water resources, into the process to ensure the capability, welfare, and the quality of life of present and future generations. Development of WSS facilities and services must consider this environmental aspect so that efforts to increase WSS service, and thus the quality of life, go concurrently with efforts to improve the environment.
- iv) *Hygiene Education*. To achieve sound WSS management, the WSS development program, as a comprehensive process, must be capable of stimulating change in community hygiene behaviour to result in the adoption of better hygiene practices. Historically, many WSS development projects have acknowledged the importance of hygiene and healthy living education programs, but such focus on health and hygiene is typically considered supplementary to the overall WSS facility and service implementation; such projects have not produced significant positive changes in hygiene behaviour and consequently WSES service development remain short-lived. Operational efforts should therefore be implemented to stress hygiene and healthy living education as a compulsory and principal component of future WSES development projects.
- v) *Poverty Focus*. In principle, every individual in Indonesia has equal rights to receive adequate and sustained WSS services. Results of various WSS

development projects indicate otherwise; such rights within the poor communities remain short of expectations. Most projects have succeeded in completing WSS facilities and services implementation on time and within budget, but they typically fall short in contributing to the poor communities who are targeted in the first place. A main reason for this flaw is the “top-down” approach implemented by all levels of government. Provision of WSS facilities and services are often based on the perceptions of government officials instead of on the needs of the community.

- vi) *Women’s Role in Decision-Making.* In rural areas, women typically search, collect, and use water for daily activities. Being directly involved with the use of WSES facilities and services, women are more familiar with convenient access design and ease of use; they have a prominent role in the development of WSS facilities and services.
- vii) *Government’s Role as Facilitator for Empowerment.* Empowerment is defined as an effort of an individual or group of individuals to build a community’s self reliance by stimulating internal potential and creativity. In an effort to improve the community’s quality of life, the government positions itself as the facilitator in the community empowerment. As such, the government should not monopolize empowerment activities, but instead should facilitate them to enhance the role and innovation of other competent institutions in developing WSS programs. Current empowerment activities, which are commonly undertaken by the community itself, universities, NGOs, and other external agencies, must be supported and enhanced.
- viii) *Active Community Participation.* The points discussed above must integrate active community participation at every phase of the WSS development process. A community’s lack of involvement causes damaging disparities in common goals and commitments, and consequently complicates the implementation of effective and efficient development concepts. Active community participation is fundamental in all the phases of WSS development. Realizing the difficulties in collecting all community members at once, the participation process must integrate a democratic system that will represent the needs and demands of the community’s majority. The role of the government, especially at the regional district and city level, remains essential in facilitating WSS development activities. Facilitation does not necessarily denote physical infrastructure construction or monetary subsidy; it should instead reflect continuous technical assistance or other non-technical advisory services. In principle, the government’s assistance must help empower the community and facilitate the community’s participation in planning, implementing, and managing WSS facilities and services.

Program Directions

Urban Water Supply Program

The future challenges is the amount of the future projected water demand up to the year 2015, it is notice that a critical feature of the water supply sector today is how to finance increased urban water supply coverage without the central government funding and international support. With sector reform, It is expected that the existing water enterprises or groups of enterprises) will expand significantly to meet demands for water from an increasing population including for providing improved access to water for the poor at a fair price, System expansions and improvements are urgently required, especially as a result of the last 5 years of limited sector investment.

To cope with the above challenge, it is recommended to:

- Tuned to Consumer Demand and Community Based Solutions
- Increased Participation of the Private Sector
- Regrouping of Water Enterprises (PDAMs)
- Corporatisation of Water Enterprises (PDAMs)
- Improved Environments through Better Wastewater Management

Rural Water Supply and Sanitation Action Program

The program goal is to help reduce poverty by improving the water supply and sanitation of poor people in rural areas, by improving access to water and sanitation, promoting pro-poor water governance, reducing vulnerabilities, and sustaining the resources base. The objective will be to create partnerships that will help to increase pro-poor rural water investments and improve their effectiveness. The program will help to achieve the Millennium Development Goals for reducing poverty and hunger, providing water supply and sanitation, reducing child and maternal mortality, and morbidity from water-related disease, and improving environmental sustainability. This will be done through a participatory and demand-responsive approach that combines advocacy, hygiene education, capacity building, and community empowerment with additional pro-poor water investments in rural areas.

Under the program, action programs will be developed and implemented in participating local government to directly target improvements to the water supply and sanitation of the rural poor. The scope of the action programs needs to be developed in the context of the needs in each local area. Wherever feasible, programs would not exclusively focus on water management, but would include related measures (such as land management, capacity development or improving access to inputs and markets) necessary to ensure the viability of the water-related livelihoods opportunities.

Programs

Water Supply and Sanitation

- (1) Actors: Ministry of Settlement and Regional Infrastructures
Directorate General of Urban and Rural Development
- (2) Title : Water Supply and Sanitation (Sector) Project
- (3) Objective: to improve beneficiaries' health and well-being by equitable delivery of potable water and wastewater services to communities in response to needs under decentralized condition.
- (4) Contents: (detailed information refer to Table 6.1)
 - Construction of water supply and sanitation facilities
 - Community and institutional development
 - Project implementation assistance
 - Project management and technical support

Water Supply

- (1) Actors: Ministry of Settlement and Regional Infrastructures
Directorate General of Urban and Rural Development
- (2) Title : Urban Water Supply and Sanitation Project
- (3) Objective: Ensuring that by 2015 all participating local governments provide consumers with water supply and sanitation services based on

consumer demand, with specific well-targeted programs of support for low income consumers.,

- (4) Contents: (detailed information refers to Table 6.2)
- Construction of water supply expansion
 - Water supply asset optimisation
 - Sanitation, pilot sewerage based on demand and best practices

Water Supply

- (1) Actors: Ministry of Settlement and Regional Infrastructures
Directorate General of Urban and Rural Development
- (2) Title : Energy Subsidy for Water Supply Program
- (3) Objective:
- To reduce living cost for water supply to low income community as an implication of increasing petroleum price;
 - To provide cheaper water supply services;
 - To develop community participation on water supply development;
 - To improve independency community organization for maintaining water supply facilities.
- (4) Contents: (detailed information refers to Table 6.3)
- Develop cheaper and easier access to water supply;
 - Socialization and guidance on planning, organizing, implementing and O&M of water supply facilities;
 - Strengthening community organization.

Debt Swap for Water and Sanitation - Provision of Drinking Water for Urban and Rural Poor

- (1) Actors: Ministry of Settlement and Regional Infrastructures
Directorate General of Urban and Rural Development
- (2) Scope of Works:
- Construction of water supply system
 - Provision of water supply facilities
 - Public participation
 - Strengthening of water user institutions
- (3) Development Program: poverty eradication and health
- (4) Prospective Donor: Canada, Spain, France, Sweden and Germany
- (5) Estimated Total Cost: US \$ 30 million

6.5 Water for Food and Rural Development

Key issues

Indonesia's growing population will continue to drive demand for food, which already now claims the dominant share of freshwater abstractions. In the latter half of last century, significant public and private investment in agriculture has resulted in much needed productivity gains, and has closed food security gaps, particularly in areas otherwise vulnerable to climatic variability.

Providing enough water in sustainable manner is therefore an enormous challenge, especially in those areas where water is already scarce. This will not only need a

substantial increase of water productivity and future additional investments for the modernization of existing irrigation structures, but also, where possible, new water resources development.

Policies

Irrigated agriculture will need to be re-thought and its comparative advantage against rain fed agriculture examined, as well as its multiple function related to society, culture and environmental conservation. Access to natural resources will have to be negotiated in order to deal with economic growth, poverty alleviation and, in some instances, also allow for local transfers to other uses. This will involve a shift in approach from a supply driven activity to a more demand responsive activity. Integrated water resources management with development is the key to this shift.

Program Directions

- A more strategic development of the available land and water resources, in order to service effective demand for food products and agriculture commodities at local and national scales and pro-poor development policies; based on climatic and environmental characteristics, in particular, focus on improving irrigated and rain fed agriculture, thereby creating opportunities to conserve the resource base-rainfall, surface and groundwater.
- A readjustment in the balance between formal irrigation water management and pro-poor, affordable agricultural water management. Low cost, small-scale options in water harvesting, irrigation and drainage to impact poverty alleviation and local food security in small rural communities.
- Programs of irrigation management reform that adapt to institutional and technical practices to turn existing rigid government command and control systems to much more participatory-flexible, service delivery systems.
- A structured and regulated participation of water users, essential to protect public and private interest in land and water resources will facilitate allocation of water to the multiple uses.
- The transfer of irrigation assets and operational responsibilities from public control to water user associations negotiated on the basis of declared rights in use and a clear understanding of the respective obligation and liabilities between public and private sectors; establish financing mechanisms and enabling environment for private investments.
- Agriculture must be more proactive in shouldering the negative environmental and health impacts of irrigated agriculture and must create opportunities for restoring the productivity of natural ecosystems through better management such as conservation agriculture and organic farming.
- Substantive additional investments are needed for the rehabilitation of existing irrigation structures and, where possible , new water resources development.

Programs

National Food Security Program

- (1) Actor : Ministry of Agriculture
- (2) Title : National Food Security Program
- (3) Objective: to fulfil national food staple demands in qualitatively and quantitatively sufficient, safe, equitable, and reachable manners.
- (4) Contents: (detailed information refer to Table 6.4)

to maintain self-sufficiency in food production through maintaining foods availability, food buffer, and distribution to fulfil national food demands

Improved Irrigation Management and Agricultural Productivity

- (1) Actor: Ministry of Settlement and Regional Infrastructure
Directorate General of Water Resources
- (2) Title : Improved Irrigation Management and Agricultural Productivity
- (3) Objective:
 - i) Initiate capacity-building process for legally empowered and self-financing community irrigation associations.
 - ii) Initiate capacity building process to improve irrigation agency services and participatory management performance.
 - iii) Improved fiscal sustainability of public irrigation schemes
 - iv) Initiate capacity building for an *Integrated irrigated agriculture support program* that increases productivity and raises family incomes by coordination of agricultural support services and a micro-credit program based and a micro-credit program based on WUA Credit group.
- (3) Content: (detailed information refers to Table 6.5)
 - (a) *Initiate a capacity building program for governance scheme by legally empowered and self-financing water user association federations* that: (i) play a governing role in formation of scheme management policy, scheduling of bulk water deliveries, setting priorities for O&M and rehabilitation investments, collecting farmer fee contributions and settling disputes; and (ii) take over full management for O&M of secondary (and larger) canal networks.
 - (b) *Initiate a capacity building process for improving irrigation agency participatory irrigation management performance* by: (i) using improved management control for irrigation network rehabilitation based on quality assurance and asset management procedures and, sustained operation of a MIS to monitor maintenance performance; and (ii) redefining their role and responsibilities to include participatory design and construction and, technical and financial assistance water user association federations.
 - (c) *Achieving fiscal sustainability in irrigation financing* by: (i) transfer of canal network maintenance responsibility to WUAFs; (ii) establishing KIIFs for rehabilitation of canals under WUAF management and based on matching contributions from WUAF members; and (iii) requiring matching contributions from WUAFs to obtain O&M grants from Kabupaten governments.
 - (d) *Initiate capacity building for an irrigated agriculture support program* consisting of: (i) an inter-agency Kabupaten Task Force to promote an integrated approach to agricultural support and linked to other Bank-supported Programs (e.g. Decentralized Agricultural & Forestry Extension Project and Kecamatan Development project), and (ii) establishing an “open menu” demand-based Agricultural Support Loan Facility for WUAs, operated by elected WUA Credit Management Units and overseen by the Kabupaten Task Force and Kabupaten Irrigation Council.

Debt Swap for Food and Rural Development

a. Improvement of Small Scale Groundwater Development in Dry Areas

- (1) Actors : Ministry of Settlement and Regional Infrastructure
(Directorate General Water Resources) and
related province and district governments
- (2) Scope of Works:

- Improvement/rehabilitation of groundwater pumps and their facilities in 9 provinces (West Java, Central Java, East Java, DI Yogyakarta, Banten, NTT, NTB, South Sulawesi, Sulawesi Tenggara).
 - Rehabilitation of groundwater irrigation canals.
 - Strengthening of water user association and institution.
 - Development of local people participation in the program to increase income
- (4) Development Program: food security, and poverty eradication.
 (5) Prospective Donor: Canada, Germany, and France.
 (5) Estimated Total Cost: US \$ 10 million

b. Improvement of Pro-Poor Small Scale Irrigation Schemes in 7 Provinces

- (1) Actors : Ministry of Settlement and Regional Infrastructure (Directorate General Water Resources) and related province and district governments
 (2) Scope of Works:
- Improvement/rehabilitation of 17,000 hectares small scale irrigation schemes in 7 provinces (West Java, Central Java, East Java, West Sumatera, Bengkulu South Sulawesi, Sulawesi Tenggara).
 - Strengthening of water user association and institution.
 - Development of local people participation in the program to increase income
- (3) Development Program: food security, and poverty eradication.
 (4) Prospective Donor: Canada, Germany, and France.
 (6) Estimated Total Cost: US \$ 16 million

c. Food Security and Poverty Eradication of Farmers in 24 Provinces

- (1) Actors : Ministry of Agriculture and related province and district governments
 (2) Scope of Works:
- Rural irrigation improvement/rehabilitation
 - Construction of small ponds in farming area for drought mitigation
 - Development of local people participation in the program to increase income
- (3) Development Program: food security, poverty eradication and water conservation.
 (4) Prospective Donor: Canada, Germany, France, and Spain
 (5) Estimated Total Cost: US \$ 34 million

d. Upland Irrigation Development Through Participatory Approach in Six Provinces

- (1) Actors : Ministry of Agriculture and related province and district governments
 (2) Scope of Works:
- Provide irrigation facilities (surface or subsurface) in upland areas
 - Provide appropriate upland irrigation technology for developing high value crops
 - Development of local people participation in the program to increase income
- (3) Development Program: poverty eradication and water conservation.
 (4) Prospective Donor: Italy, Sweden and Finland
 (5) Estimated Total Cost: US \$ 640,000

e. Rain-fed Development for Horticultural Production Through Shallow Groundwater and Small Ponds Development in 6 Provinces

- (1) Actors : Ministry of Agriculture and related province and district governments
- (2) Scope of Works:
 - Transfer micro irrigation technique on Survey, Investigation, Design, Construction, water and farming management and institutional strengthening.
 - Disseminate rain-fed micro irrigation farming to neighbouring areas.
 - Development of local people participation in the program to increase income
- (3) Development Program: poverty eradication .
- (4) Prospective Donor: Italy, Sweden and Finland
- (5) Estimated Total Cost: US \$ 1 million.

f. Provision of Rural Housing and Rural Environment Improvement in 17 Provinces

- (1) Actors : Ministry of Settlement and Regional Infrastructure and related province and district governments
- (2) Scope of Works:
 - Construction of 3,750 units of rural house
 - Improvement of rural roads, drainage and sanitation for 45,700 families.
- (3) Development Program: rural development and poverty eradication
- (4) Prospective Donor: Canada, Germany, and France.
- (5) Estimated Total Cost: US \$ 120 million

6.6 Water Pollution Prevention and Ecosystem Conservation

Key Issues

The necessary steps to protect fresh-water ecosystem include:

- Adopting a participatory ecosystem-based management (a river basin/watershed/aquifer) approach to water resources management, which provides a framework for addressing environmental needs;
- Providing ecosystem security by leaving enough water in ecosystem to both sustain them, and their ability to provide services;
- Protecting surface and groundwater from pollution by controlling of pollution and waste.

Addressing these four main issues require also the following:

- Strengthening or empowering stakeholder participation in decision making by raising awareness and capacity building;
- Developing and exchanging knowledge by using soft engineering, appropriate clean technology, indigenous crop varieties, reconsidering infrastructure and ecosystem-based management know-how, in combination with traditional and appropriate social and economic mechanisms;
- Valuing water in a way that accounts for ecosystem functions and services, and charges polluters for the full cost to the system.

As part of water sector reform agenda, the Gol had issued a new Government Regulation No. 82/2001 on Water Quality Management and Water Pollution Control, which replace the Government Regulation No 20/1990 on Water Pollution Control and utilize Law No 23/1997 on Environmental Management. This new Government Regulation No. 82/2001 provides an opportunity to harmonize “water resources management” and “environmental management” since both water pollution

regulation, water abstraction licensing and basin management are vested in regional governments. River basin entities may be appropriate agencies for operational water quality management tasks under agreement with provincial pollution control agencies whose primary role is regulation. To implement the Government Regulation No 82/2001, 10 (ten) Ministerial Decrees are now being formulated and to be finished by the end of March 2003.

Policies

Subsequent to the issuance of Government Regulation No. 82/2001, the Minister Coordination on Economic Affairs also had issued Ministerial Decree No 15/M-EKON/12/2001 on The Direction National Water Resources Management Policy. This Ministerial Decree also set a policy direction on water resources conservation as follows:

1. To increase and restore water availability for benefits of present and future generations.
2. To increase and restore water quality to fulfil water demand for present and future generations.
3. To restore and maintain water resources environment bearing capacity to ensure water availability for fulfilling demands of present and future generations.

Program Directions

The followings are efforts that will be implemented by a joint effort between the State Ministry of Environment, Ministry of Settlement and Regional Infrastructure and Ministry of Forestry together with related Provincial, District and City governments as well as all stakeholders of water resources in the near future (some may on-going activities).

Integrated Catchment Management (ICM)

In order to ensure the sustainability of the function of catchment area, the implementation of integrated management of catchment area has to follow the principle of hydrology. In an ecology term of a catchment area, the main input component of the catchment is rainfall, while the component of output are river flows, and sediment including its nutrient and pollution components. A Catchment area consists of the following interrelated components, i.e., vegetations, soils, topography, water, rivers, and people that have processor function. Therefore it is necessary that each component to be optimally in function.

Master plan of conservation of catchment area includes: I) to control land use for maintain the function of catchment area as a water infiltration area through regulation of spatial planning by allocating some open spaces for water infiltration, either naturally or man made such as a infiltration wells, ii) implementation of conservation activities on water and soil such as rehabilitation of soil (terracing, etc.), reforestation, erosion-sedimentation control, etc., and iii) monitoring and evaluation on the implementation of master plan of catchment area conservation.

b. Program Kali Bersih/PROKASIH (Clean River Program)

The objective of Prokasih 2005 consist of the following three main components:

- i) To increase quality of river flows.
- ii) To restore function, utilization and efficiency of river environment.
- iii) To increase capacity of human and institutional resources in the field of water pollution control.

c. Integrated Management in Less-Developed River Basins.

In an effort to strengthen water resources management based on a river basin approach in less-developed basins, the Government is setting up basin level organizations called Balai PSDA. The roles of these Balai PSDAs are gradually strengthened in licensing of water abstraction and effluent discharge, efficient water allocation, conjunctive use of groundwater and co-ordination with watershed management programs. In particular, cooperation with Balai Rehabilitasi Lahan Kritis/BRLKT (Critical Catchment Rehabilitation Unit) in implementing Integrated Catchment Management and Bapedalda in implementing Prokasih.

d. Strategic Developed River Basins.

In developed and strategic basins of national importance, the Government is strengthening various aspects of basin water resources management, water allocation and water quality, by establishing self-financing river basin management corporations that are centrally managed. Currently two basins are already managed by public corporations, i.e., Jasa Tirta I (Brantas river basin) and Jasa Tirta II (Citarum river basin) and four more basins, i.e., Bengawan Solo, Serayu-Bogowonto, JRATUNSELUNA, and Jeneberang are targeted to have such organizations, to establish financially sustainable and autonomous organizations in keeping with the tenets of the national reform. One of the tasks in the management of river basin is to cooperate in the Prokasih by providing the result of water quality monitoring to Bapedalda in related provinces and other water quality management activities. Cooperation with BRLKT in its respected areas is also important in the efforts of maintaining sustainability of catchment areas.

e. Water Pollution Control Framework and Institutions.

To support regional/river basin water quality management and pollution control, the government is formulating a more effective, enforceable and sustainable, regulatory and financial framework to abate river, lake and reservoir pollution by industrial and domestic urban effluents. Legal and regulatory instruments will be developed on the basis of affordable publicly accepted stream standards, river basin management needs and environmental conservation. This will enable the strengthening of water quality management in priority river basins through investment and regulatory control of water pollution.

f. People's empowerment for responsible water use and conservation

Ecosystem-based catchment management can be implemented successfully when it takes a path that is based on people's well-informed decision-making, and adoption to changing conditions. This is a process that enables humans to improve their standards of living and lead their lives in dignity and fulfilment, while learning to conserve their resources base and contribute in a meaningful way to solidarity within their society.

Devolution of power to local levels, and people's participation in water management decision-making, requires individuals to take up new responsibilities and become actively involved. Water-related problems have taken a long time to reach this critical stage; persistence, tempered with patience, is needed to find solutions. Energy and capacities exist at local levels that can be complemented, where appropriate, with technical expertise by NGOs, CBOs, research institutes or governments.

g. Raising Public Awareness

Public awareness, private sector responsibility and a general commitment among local groups to protect water resources are fundamental to establishing change. Often underestimated but potentially influential is the role of religious groups. These

can provide leadership, and raise the awareness of communities and individuals of the need to protect our environment and take personal responsibility for caring for it. Community-based groups, such as service and user groups, labour unions, and women's and youth organization, also have a key role to play in stimulating changes in human behaviour to spread around the world.

h. Monitoring and Evaluation Mechanism

The monitoring and evaluation of national policies on integrated water resources development and management is based on Presidential Decree No. 123/2001 and implemented by the Coordinating Team for Policies Water Resources Management. The Coordination Team consists of eleven (11) inter – ministerial agencies and chaired by Minister of Coordination on Economic Affair. At the provincial and river basin level, the implementation of policies is monitored and evaluated by Provincial Water Resources Committees and Basin Water Resources Committees, consisting of regional and local government officials representing sector interests (e.g., agriculture, forestry, environment, etc.)

In line with water sector adjustment sector program, the Coordination Team will evolve into the national apex body or National Water Council. The National Water Council will comprise of various ministers that are responsible for water resources development and management, and will include a permanent advisory group of stakeholders, NGOs and public representatives. Meanwhile, The Provincial and Basin Water Resources Committees will be transformed into Provincial and Basin Water Resources Councils. The membership of these councils will not be limited only to the local government officials representing sectoral interests, but will also cover multi-stakeholder representation.

This mechanism hopes to ensure that outputs, outcomes, and impacts of water policies are maintained in an acceptable level by providing the executing agencies with direct feed back and corrective measures. This monitoring and evaluation mechanism encourages implementation of the spirit of good governance, i.e. public accountability and transparency.

6.6.4 Programs

6.6.4.1 Study on Master Plan of Counter Measures for Critical Rivers and Lakes in Indonesia

- (1) Actors : Ministry of Settlement and Regional Infrastructure
(Directorate General of Water Resources)
- (2) Title : Study on Master Plan of Counter Measures for Critical Rivers and Lakes in Indonesia
- (3) Partners : proposed to GEF, JICA, UNDP
- (4) Objective:
 - a. to inventory current condition of critical catchments and lakes in Indonesia
 - b. to identify and recommend a short and long term (master plan) counter measures for conservation of critical catchments and lakes that contain structural measures and non-structural measures.
 - c. to recommend priority of implementation of counter measures on critical lake and rivers based on the finding of inventory and identification of counter measures (point a and b above).
 - d. to prepare general guidelines and principal based for participatory ecosystem watershed including water resources infrastructures management.
- (5) Contents: (detailed information refers to Table 6.6)
 - a. Inventory and consolidation of any existing studies and works on critical catchments and lakes

- b. Inventory current condition of critical rivers catchments and lakes through the use of satellite imagery
- c. Conduct site survey on river catchments and lakes based on the finding of a) and b) activities
- d. Identification and recommendation of a short and long term (master plan) counter measures (“structural measures and non-structural measures”) for conservation of rivers catchment, rivers and lakes.
- e. Prioritisation of implementation of structural and non-structural counter measures on critical rivers and lakes
- f. Preparation of action plan of joint actions for participatory ecosystem-based on catchment conservation and management approach

6.6.4.2 Conservation and Management of Lakes Program

- (1) Actors : State Ministry of Environment, Ministry of Settlement and Regional Infrastructure, Ministry of Forestry, LIPI, BIOTROP, PLN
- (2) Partners : ProLH GTZ, UNDP, GEF, JICA
- (3) Title : Conservation and Management of Lakes Programme
- (4) Objective:
 1. Sustainable use of Lakes
 2. Control pollution and conserve water resources and rehabilitate the physical condition of lakes
 3. Conservation of lake environments
- (5) Contents: (detailed information refers to Table 6. 7)
 1. Clean Lake Program
 2. Conservation of catchment/watershed/river basin levels
 3. Rehabilitation and restoration of degraded Lake Ecosystems
 4. Establishing Indonesian Lakes Forum
 5. Strategy and Action Plan for Lakes Management

6.4.3 Debt Swap for Water Pollution Prevention and Ecosystem Conservation

a. Revitalization of Small Reservoirs in Jakarta, Bogor, Depok, Tangerang and Bekasi (JABODETABEK) Area

- (1) Actors : Ministry of Settlement and Regional Infrastructure and related province and district governments
- (2) Scope of Works:
 - Rehabilitation and management of 100 unit small reservoirs (situ-situ)
 - Development of people participation.
 - Public awareness campaign and public consultation.
 - Preparation of plan for utilization of small reservoir.
 - Strengthening of institution
- (3) Development Program: water resources conservation, environment and poverty eradication
- (4) Prospective Donor: Italy, Sweden and Finland.
- (5) Estimated Total Cost: US \$ 75 million

b. Water Pollution Control in Leather Tanning Small Scale Industry in Sukaregang, Garut, West Java.

- (1) Actors : State Ministry of Environment and related province and district governments
- (2) Scope of Works:
 - Construction and rehabilitation of waste water treatment system;

- Empowering and increasing Small Scale Enterprises (SMEs) awareness to environment;
 - Capacity building for local government in managing the environment;
 - Utilization of waste treatment and waste.
- (3) Development Program: environment and good environment governance
 (4) Prospective Donor: Canada, Germany, France, and Spain.
 (5) Estimated Total Cost: US \$ 3,30 million

c. Water Pollution Control in Batik Small Scale Industry in Pekalongan, West.

- (1) Actors : State Ministry of Environment and related province and district governments
- (2) Scope of Works:
- Study activities;
 - Program socialization and education & training;
 - Construction of waste water treatment and its management;
 - Capacity building for local government in managing environment.
- (3) Development Program: environment and good environment governance
 (4) Prospective Donor: Canada, Germany, France, and Spain.
 (5) Estimated Total Cost: US \$ 600,000

d. Utilization of Coconut Shell Waste into Economic Products in North Sulawesi

- (1) Actors : State Ministry of Environment and related province and district governments
- (2) Scope of Works:
- Construction of coconut shell waste utilization;
 - Increase of local community awareness to environment protection;
 - Empowering local community skills in utilizing waste.
- (3) Development Program: poverty eradication, environment and good environment governance
 (4) Prospective Donor: Canada, Germany, France, and Spain.
 (5) Estimated Total Cost: US \$ 750,000

e. Pollution Control in Upper Citarum Watersheed in West Java

- (1) Actors : Provincial Government of West Java and related district/city governments
- (2) Scope of Works:
- Construction of 17 unit of communal domestic wastewater treatment plants
 - Construction of centralized waste water treatment for industry in South Cimahi;
- (3) Development Program: environment, poverty eradication, water resources conservation, and education.
 (4) Prospective Donor: Canada, Germany, France, Sweden, Finland, and Spain.
 (5) Estimated Total Cost: US \$ 9,0 million.

f. Conservation of Upper Citarum Watersheed in West Java

- (1) Actors : Provincial Government of West Java and related district/city governments
- (2) Scope of Works:
- Construction of small pond 17 units, check-dam 20 units, gully plug 100 units and groundwater recharge 100 units;
 - Rehabilitation of degraded land and forest;
 - Environmental public awareness and community participation
 - Strengthening of institutions.

- (3) Development Program: environment, poverty eradication, water resources conservation, and education.
- (4) Prospective Donor: Canada, Germany, France, Sweden, Finland, and Spain.
- (5) Estimated Total Cost: US \$ 21, 6 million.

6.7. Disaster Mitigation and Risk Management

Key Issues

There are about 5,590 main rivers that have direct access to the sea or lakes. Among them, about 600 rivers have caused significant detrimental flood hazard and continuous threat to about 1.4 million hectares of flood prone area that consist of inhabitant (urban and rural) areas, industrial and agricultural areas as well as transportation facilities such as roads, bridges, and access roads to harbours and airports.

In total, it is estimated that 30,000 km of dike and its associated appurtenances structures and about 15,000 km of river normalization are required in order to control floods on 600 rivers in all over area of Indonesia. However, completion of flood control works still fragmented. Among those required flood control infrastructures, only 2,600 km of dike (8% of the total required) and 1,500 km of river normalization (10% of the total required) had been completed. So far about 420,000 Ha (30% of total flood prone areas) areas are protected from floods with return period of 5 years to 25 years. It should be noted that capacity of national annual budget allocation for construction of flood control facilities is very limited compare to the total number of works required, i.e., 300 km/year for dike and 300 km/year for river normalization, therefore with such budget allocation capacity, a very long time (probably 100 years) is required to protect the whole flood prone areas.

Torrential rains during 2002 rainy season caused severe floods, especially in Java Island. It was reported that a total of 90 people were killed or missing, about 380,000 people had to evacuate their homes, and some 400,000 hectares of towns and villages, and 48,000 hectares of agricultural land were deeply submerged. The normal activities in Jakarta city were disrupted for several days. The damages of roads, school buildings, dykes and drainage caused by the floods were estimated at \$ 200 million. In the meantime, the record of floods and landslides victims and damages in this rainy season of 2003 that now is still going on shows that 134 person were killed, 55 people still missing, about 122,755 people had to be evacuated and some 12,303 hectares of towns and villages, and about 88,385 hectares of agricultural land were inundated. The damages of public facilities are estimated about \$ 110 million.

Policies

Decentralization and devolution of authority to local governments in recent years has increased the need for strengthening of capability for the river basin and flood management at the provincial and district level in implementing the comprehensive policy of flood management (Chapter 5, para 5.5.4) District/City governments have the authorization of the overall management of rivers including conservation, to make effective use and benefit of rivers at the districts/city areas concerned. In order to fulfil this authorization, the Districts/City Governments are responsible to prepare, among others, master plan of the river basin management and issue all permit and

document required for river utilization. The authorization and responsibility on the management of rivers that flow across districts, belong to the provincial governments concerned. The central Government is responsible for the management of rivers that flow across provinces and countries. It is important to strengthen their capability for improvement of the performance of operation and maintenance (O&M) of the flood management scheme.

Program Directions

- *Institutional strengthening and Cost Recovery* Balai PSDA under the Provincial governments is responsible for the O&M of flood management facilities, but Balai PSDA is still weak in terms of budgetary provision and staff capability. It is necessary to strengthen the staff in Balai to make proper O&M plan and implement O&M works for the flood management facilities. For the budgetary purpose, cost recovery mechanisms should be studied and implemented to make the flood management sustainable.
- *Incentive for watershed conservation.* If the administrative boundary separates the upper watershed area and the downstream flood-prone area, it would be very difficult to convince the upper district government to invest heavily for the proper watershed management such as re-greening activities, construction of erosion control structures. It is necessary to develop mechanisms to give the incentive for upper district governments to maintain the watershed properly. Income generation activities for the people living in the watershed area will be one of the mitigation measures.
- *Mechanisms to restrict conversion of land use.* Proper mechanisms are required to restrict conversion of land use and to control the development activities in the basin. The flood retention basin has been encroached by the housing development projects, wetland became less and less because of the development activities. The topographically depressed area should not be developed for the residential area unless residential developers pay the cost for proper flood protection works. Watershed area should be protected properly from the encroachment.
- *Proper flood early warning system* The current flood early warning system does not have a proper link to the flood affected communities at the village level. The preparation of flood hazard map is required to give the proper warning to evacuate the people living in the flood prone areas. Flood forecasting system, flood warning system and flood hazard map and evacuation plan should have a close link in the river basin.

Programs

Flood Management in Selected River Basins in Java

- (1) Actor: Ministry of Settlement and Regional Infrastructure
(Directorate General of Water Resources).
- (2) Title : Study on Flood Management in Selected River Basins in Java
- (3) Objective: this TA (Technical Assistance) of ADB is to prepare an investment project for flood management in selected basins in Java:
 - (i) identify the most appropriate flood management strategy to support the comprehensive flood management plan for the basins in Java;
 - (ii) strengthen the capacity for Integrated River Basin Management (IBRM);
 - (iii) select the most appropriate river basin in Java and prepare a feasibility study for at least two representative river basins;

- (iv) formulate a project for improved flood management of the basins in Java.
- (3) Contents: (detailed information refers to Table 6.8)
 - (i) provide a clear overview of the Government's flood management strategies, priorities, and investment plans;
 - (ii) assess the completeness and adequacy of the existing flood management plan for the basins based on technical, institutional, environmental, social, economic, financial, and other relevant factors;
 - (iii) formulate recommendation, as appropriate, for adjustment of the plan, and for institutional strengthening, improvement of coordination, legislative reforms, financing, cost recovery, and standardizing the justification of proposed works;
 - (iv) institutionalise participatory approaches into selection and formulation of flood control measures;
 - (v) formulate a watershed management plan in the basin;
 - (vi) help to integrate sound environmental management and increased social awareness into planning into the planning, design, and implementation of flood management; etc

Development of Flood Control Measures In Strategic Area

- (1) Actor: Ministry of Settlement and Regional Infrastructure
(Directorate General of Water Resources).
- (2) Title : Development of Flood Control Measures in Strategic Areas
- (3) Objective: this proposed soft loan of JBIC is to fund some investment projects for flood management in selected strategic river basins :
 - (i) consolidate and review the feasibility study and the detailed design of the most appropriate flood control measures to support the comprehensive flood management plan for the strategic river basins;
 - (ii) construction of flood control measures to reduce risks and mitigate flood hazard;
 - (iii) strengthen the capacity for Integrated River Basin Management (IBRM);
- (4) Contents: (detailed information refers to Table 6.9)
 - (i) Jakarta-Bogor-Depok-Tangerang-Bekasi (JABODETABEK) area: a) review and detailed design of adopted measures, b) improvement of Banjir Kanal Barat, c) construction of Banjir Kanal Timur, d) river normalization of 13 rivers, e) construction of adopted measures in a) such as reservoirs at upstream Ciliwung and Cisadane, etc, and d) instalment of flood warning system;
 - (ii) Medan and surrounding area: implementation of Medan Flood Control Phase II;
 - (iii) Semarang and surrounding area: a) improvement of Banjir Kanal Barat and Banjir Kanal Timur, b) construction of polder systems in lower areas, and c) construction of Jatibarang dam at Kreo river.

Capacity Building, Sharing Information and Creating Networks on Disaster Management (Change of Global-Regional Water Cycle)

- (1) Sectoral Topic: Disaster Mitigation and Risk Management
Water Resources Management and Benefit Sharing
- (2) Actors
 - Indonesian institution: Ministry of Settlement and Regional Infrastructure, State Ministry of Research and Technology, BPPT, LAPAN, BMG, BAKOSURTANAL, and State Ministry of Environment
 - Metrology Organization: WCRP/WMO, IPCC, NOAA
 - Satellite Organization: CEOS, NASA, ESA, EC

- (3) Title : Capacity Building, Sharing Information and Creating Networks on Disaster Management (Change of Global-Regional Water Cycle)
- (4) Objective :
- i) Provide scientific knowledge and technological basis on improved forecast of hazard occurrence and associated predictions of intensity, with greater precision at regional or local level and establish disaster reduction strategy/initiatives.
 - ii) Establish water resources management for sustainable development in order to avoid or minimize the effect of change of water supply/demand and water cycle on human society.
 - iii) Propose sustainable and preferable methods based on these knowledge and basis for water management.
 - iv) Shared the information collected by the methods with the countries that are faced by serious water problems.
- (5) Content: (detailed information refers to Table 6.10)
- i) Development of precise hazard (floods, lands slides, tsunami, cyclone, earth quake, etc) forecast and establishment disaster reduction strategy.
 - ii) Regional “global warming”/water cycle program: establish regional water cycle observation program which enables mutual use of the observation data through the promotion of systematic observation such as satellite/ocean observation, land investigation and monitoring.
 - iii) Development of water cycle change model. Develop model forecast the change of water cycle due to the changes of water resources demand/supply, climate changes/global warming, etc.
 - iv) Evaluation of social effects. Implement quantitative evaluation of the influence to food, water resources, ecosystem, human health, society, economy, etc. based on the environmental change forecast due to the change of water cycle.
 - v) Integrated policy evaluation program. Implement the evaluation on the applicability of the existing technology developments, and present countermeasure scenario in order to develop sustainable and desirable water management.

6.8 Water Resources Management and Benefit Sharing

Key Issues

Currently the Gol is undertaking implementation of water resources sector reform. The ultimate outcome of the reform program should be a “capable” institutional framework, which draws its enhanced performance from :

- Enhancement of Integrated Water Resources Management (IWRM), and relevant actions are intensified on every levels promoting dialogue among all stakeholders to meet the water resources management challenges;
- Better sector governance with greater transparency and accountability in decision-making through stakeholder participation at local levels;
- Public as well as inter-agency consultation
- Improved public expenditure management by introducing economic and financial considerations for investment decisions and water allocation, and enhancing cost recovery.

Policies

The National Water Resources Management Policy framework is able to support and guide the development and conservation efforts of all government and private entities. The policy is covering water quantity and quality for both surface and groundwater in the context of river basins, including upper watersheds and estuarine areas.

The National Water Resources Management Policy (NWRMP) would include:

- (i) introduction of a water rights framework through a pilot river basin for water allocation and utilization conducive to economic and social development and environmental sustainability;
- (ii) improving the efficiency in utilization of water, particularly for irrigation;
- (iii) attaining regional surface and ground water quality levels that are compatible with both socio-economic development and environmental sustainability;
- (iv) developing participatory institutions for prioritised, integrated spatial and river basin planning processes, based on participatory involvement of stakeholder representatives in water resources and irrigation decision-making and activities;
- (v) financing of irrigation networks;
- (vi) establishing a sustainable planning, programming and budgeting system for water resources development and management under a framework for regional autonomy and government decentralization;
- (vii) creating a national and regional water resources management structure to support and implement integrated river basin management;
- (viii) improving coordination between forestry, agriculture, conservation and water resources sector activities in watershed management; and
- (ix) establishing a specific integrated policy for environmentally sustainable wetland and swampland development.

Program Directions

The goals of long-term programs in water resources management in the form of institutional strengthening and capacity building, among others are the following :

- (a) *more sustainable, transparent and equitable inter and intra-sector water allocation and management* through a water use rights system, conjunctive use of groundwater, prioritised rehabilitation of river infrastructure and, reliable river discharge and water use management;
- (b) *improving governance and accountability in national and regional water resources management* through strengthening institutions for stakeholder involvement;
- (c) *improving sector management by strengthening mechanisms for discharging of agency mandates and their fiduciary responsibilities* through the cost effective raising awareness in programming and budgeting, building regional capacity for sector and basin planning, use of management controls based on asset management, cost accounting and quality assurance procedures;
- (d) *conserving surface and groundwater on a basin-wide scale* through better water quality management based on licensing of water abstraction and

wastewater discharge, economic regulatory mechanisms for water pollution control and, reliable monitoring of wastewater discharges and river water quality.

- (e) *Promoting corporation of government water service* by: (i) ensuring that new River Basin Corporation have adequate revenue to cover the cost of more efficient service provision, (ii) supporting organization for corporate management of provincial water services, and (iii) greater involvement of the private sector in sector activities and services.

Programs

Improved Water Resources Sector Performance

- (1) Actor: Ministry of Settlement and Regional Infrastructure
(Directorate General of Water Resources) and The State Ministry of Environment
- (2) Objective:
- i) Initiate capacity-building process for improved governance and accountability in sector management agencies;
 - ii) Initiate capacity building process for improved basin agency management performance in discharging of their mandates and responsibility;
 - iii) Initiate program for achieving fiscal sustainability, and
 - iv) Improved water demand management and water resources conservation in project basin.
- (3) Content: (detailed information refers to Table 6.11)
- (a) *Initiate a capacity building program for governance and, accountability* in sector management agencies focusing on: (i) strengthening the National Water Council Secretariat; (ii) developing the understanding and capabilities of Provincial and River Basin Councils to influence agency policies, planning and management decisions; (iii) developing the water resources sector understanding of provincial and Kabupaten parliaments; (iv) developing public awareness through public consultation in the preparation of Basin Water Resources Management Plans (BWRMPs); and (v) developing and piloting a water use right system.
 - (b) *Initiate a capacity building process for improved basin agency management* in discharging of their mandates and responsibility by: (i) developing management controls based on quality assurance and asset management; (ii) development and use of an inter-agency management information system (MIS) for management decision-support; and (iii) supporting the strengthening of management in new River Basin Corporations (RBCs) in highly-developed river basins.
 - (c) *Initiate a program for achieving fiscal sustainability* by: (i) establishing new mechanisms to increase cost recovery for water service and reduce the fiscal burden of infrastructure maintenance; (ii) using economic instruments to cover costs of water quality monitoring and construction of wastewater treatment facilities; (iii) use of cost-effective criteria and cost accounting in agency programming and budgeting; (iv) improving the revenue of RBCs from their water service; and (v) reducing surplus staff numbers, fostering public-private partnership and greater out-sourcing of agency operations.
 - (d) *Improved Water Demand Management and Water Conservation in Project Basins* by: (i) allocating and conjunctively managing water resources more equitably and sustainable; (ii) conserving surface and groundwater resources; (iii) establishing the National Water Quality Monitoring Network and strengthening the new institution for improving the reliability of hydrological data; and (iv) developing a framework for strategic allocation of

limited infrastructure development funds between urban water supply, irrigation, water quality management and flood control needs .

National Water Partnership Proposal

- (1) Sectoral Type : Water Resources Management and Benefit Sharing
- (2) Actors : Indonesia institution: Indonesian Water Partnership (IWP)
International organizations: FAO, IFAP, GWP, ICID, IUCN, IWMI, UNEP, WHO, WWC and WWF
- (3) Title : Dialogue on Food, Water and Environment
- (4) Objective :
 - i) Long term objective: Improve water resources management for food security and environmental sustainability with a special focus on the reduction of poverty and hunger and the improvement of human health.
 - ii) Intermediate objective: Build bridges between agricultural and environmental communities on water resources issues by improving the linkages between the sectoral approaches that dominate policy making and implementation, particularly at national level.
 - iii) Immediate objective: Establish a dialogue that will produce tangible solution for the seemingly conflicting interests of water for food and environment, primarily at national and local levels and draw together, maintain and improve the required knowledge base for the Dialogue. Identify best practices and raise awareness amongst the relevant actors and stakeholders.
- (5) Contents: (detailed information refers to Table 6.12)
 - i) *Preparatory phase* (at national level) that consist of the following activities: establishment of a small coordinating unit, preparation of Dialogue proposal, training of the trainers, establishment of dialogue agenda, and preparation of dialogue materials such background study/situation analysis on: i) assessment on water availability (water balance) and water sustainability by islands or river basins, ii) assessment on food demand for various scenarios up to 2025, iii) assessment watersheds/river catchments (including river, lake, and groundwater) degradation, iv) assessment of water demands for people, food, environment, and industry for various scenarios (what if scenario) up to 2025, and v) study on identification of conflicts (agriculture vs. environment, etc) to be discussed in dialogue.
 - ii) *Implementation phase* (at national, provincial and river basin levels) that consist of the following activities: a number of Dialogue on Water, Food and Environment at provincial and river basin level where there are potential conflicts between water for food and the environment. This will culminate in a Dialogue at the national level to draw up the recommendations for policies and programs on water for food and environment. The results and recommendations of the Dialogue shall be submitted to the Government for their consideration and appropriate action; and
 - iii) *Plan for Follow –up Actions* (at national, provincial and river basin levels) consisting of institutionalising of the Dialogue results and recommendations in the form of adopted regulations, policies and programs and establishment of performance indicators and monitoring process.

7 Summary and Conclusion

This report summaries the follow up actions to the 2nd World Water Forum that have been taken by water stakeholders, water resources substantive and institutional

problems, water resources sector reform to address the problems, response and actions undertaken by stakeholders on seven water resources management challenges and Portfolio of Water Actions that consist of a compilation of the statements of programs and actions undertaken by government and its national and international partners that includes debt swap schemes to Indonesia's development partners.

It is understood that the underlying "world water crisis" including in Indonesia is not merely associated with the severe scarcity of water to meet the human needs, rather, the crisis is most commonly due to inability to manage this distinct natural resources—a crisis of water governance. The Ministerial Declaration of The Hague on Water Security in the 21st Century, has therefore identified this problem as one of seven challenges in water resources management and the *Integrated Water Resources Management* (IWRM) has been agreed as an appropriate method to tackle those challenges.

As a follow up of the 2nd World Water Forum, the 1st Indonesian Water Forum was conducted in November 2000. This forum involving all components of stakeholders in water resources sector, including Water User Associations (WUAs), water user communities, NGOs, professional organizations, academia, private sectors, government institutions as well as member of parliaments in promoting *Integrated Water Resources Management (IWRM)*. In order to be able to accommodate the activities of the Forum, The *Kemitraan Air Indonesia – KAI* or The Indonesian Water Partnership (IWP) was established in March 22, 2002 on the occasion of The 2nd Indonesian Water Forum to celebrate the World Water Day - 2002. The establishment of the IWP is also intended to facilitate optimum networking with international water institutions such as the Global Water Partnership (GWP). Further to the above objectives, the Indonesian Water Partnership also aims to establish synergy and cooperation for realizing the benefits of sustaining water for human welfare through "*Integrated Water Resources Management*" approach.

Following its establishment, the IWP with technical and financial assistances from GWP-SEATAC and internal donors has promoted IWRM in the following activities: 1) national workshop on effective water governance, 2) workshop on Public Awareness Campaign on Water Conservation, 3) compilation of the IWRM's campaign material for Elementary, Secondary, High Schools, university, practitioners, and politicians, and 4) preparation of proposal on Dialogue on Food, Water and Environment to the Dialogue Secretariat that has compiled resources from FAO, IFAP, GWP, ICID, IUCN, IWMI, UNEP, WHO, WWC, and WWF to facilitate measures to alternative resolutions of the problems.

As presently experienced in many other countries, the condition of water resources in Indonesia has come to the stage where an integrated action is needed to reverse the present trends of over-consumption, pollution, and the increasing threat of drought and floods.

Given the challenges facing the water resources and irrigation sector in the 21st century and the public sector reformation aspirations, the Government of Indonesia has initiated the water resources sector reform program that covers policy, institutional, legislative and regulatory aspects including water conservation policies have got a substantial portion in the reform agenda.

The ultimate outcome of the reform program would be a "capable" institutional framework, which draws its enhanced performance from :

- Better sector governance with greater transparency and accountability in decision-making through stakeholder participation at local levels;
- Public as well as inter-agency consultation
- Improved public expenditure management by introducing economic and financial considerations for investment decisions and water allocation, and enhancing cost recovery.

From the previous discussions on Chapter 4 Indonesian Water Resources Policy Reform and Chapter 5 Challenges for Indonesian Water Management can be concluded that the water resources sector reform program and the revised water resources law and comprehensive water quantity and quality management is sufficient and comprehensive enough in addressing the seven challenges in achieving water security. However, a greater effort is still required in term of structural and non-structural measures for disaster mitigation and risk management. Promotion of cooperation in the field of observation Change of Global-Regional Water Cycle, capacity building, sharing information and creating networks on disaster management with relevant international organizations such as WCRP/WMO, IPCC, NOAA, CEOS, NASA, ESA, EC is very important to be realized.

In conclusion, we hope that the ambitious reform program described above is one that will be strongly supported by all multilateral and bilateral agencies active in the water resources sector. When the policy reform program is completed by the end of December 2003, we are looking forward to cooperate further in undertaking public and private capacity building programs needed for full implementation of the proposed reforms. We also look forward to future international cooperation in generating support for the programs and actions proposed on the Portfolio of Water Actions in this very important occasion of the 3rd World Water Forum in Kyoto, Japan.

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TABLE 6.1

Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	<i>Water Supply and Sanitation</i>
Actor(s) [Nation (Ministry Agency)/Organization]	Ministry of Settlement and Regional Infrastructures Directorate General of Urban and Rural Development INDONESIA
Partner(s)	ADB
Title	<i>Water Supply and Sanitation (Sector) Project</i>
Objective	to improve beneficiaries health and well-being by equitable delivery of potable water and waste water services to communities in response to needs under decentralized condition
Contents	<ul style="list-style-type: none"> • Construction of water supply and sanitation facilities • Community and institutional development • Project implementation assistance • Project management and technical support
Means of Implementation	<ul style="list-style-type: none"> • Private sector participation • Public investment • Community participation
Target Year	2003-2009
Target Area/Place	Indonesia, 20 cities (local government: district/kabupaten)
Expected outcome(s)	improving access of the poor to health, water and sanitation services
Relevance to the plan of Implementation of WSSD	Para 7 and 24
Other Information	
Contact	

Note*: ex. Safe Drinking Water, Sanitation, Biodiversity, Ecosystem Conservation, Water Resources Management, Disaster Prevention, etc.

TABLE 6.2

1/1

Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	<i>Water Supply and Sanitation</i>
Actor(s) [Nation (Ministry Agency)/Organization]	Ministry of Settlement and Regional Infrastructures Directorate General of Urban and Rural Development INDONESIA
Partner(s)	IBRD
Title	<i>Urban Water Supply and Sanitation Project</i>
Objective	Ensuring that by 2015 all participating local governments provide consumers with water supply and sanitation services based on consumer demand, with specific well-targeted programs of support for low income consumers
Contents	<ul style="list-style-type: none"> • Construction of water supply expansion • Water supply asset optimization • Sanitation, pilot sewerage based on demand and best practices
Means of Implementation	<ul style="list-style-type: none"> • Private sector participation • Public investment
Target Year	2003-2008
Target Area/Place	Indonesia, 60 cities (local government: district/kabupaten)
Expected outcome(s)	<ul style="list-style-type: none"> • Improving access of the poor to health, water and sanitation services • Sustainable management of water resources
Relevance to the plan of Implementation of WSSD	Para 7 and 24
Other Information	
Contact	

Note *: ex. *Safe Drinking Water, Sanitation, Biodiversity, Ecosystem Conservation, Water Resources Management, Disaster Prevention, etc.*

TABLE 6.3

1/1

Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	<i>Water Supply and Sanitation</i>
Actor(s) [Nation (Ministry Agency)/Organization]	Ministry of Settlement and Regional Infrastructures Directorate General of Urban and Rural Development INDONESIA
Partner(s)	District and Local Governments
Title	Energy Subsidy for Water Supply Program
Objective	<ul style="list-style-type: none"> • To reduce living cost for water supply to low income community as an implication of increasing petroleum price; • To provide cheaper water supply services; • To develop community participation on water supply development; • To improve independency community organization for maintaining water supply facilities
Contents	<ul style="list-style-type: none"> • Develop cheaper and easier access to water supply; • Socialization and guidance on planning, organizing, implementing and O&M of water supply facilities; • Strengthening community organization
Means of Implementation	<ul style="list-style-type: none"> • Community Based Development • Public investment
Target Year	2003
Target Area/Place	Indonesia, all provinces, districts and cities
Expected outcome(s)	<ul style="list-style-type: none"> • Improving access of the poor to health, water and sanitation services • Sustainable management of water resources
Relevance to the plan of Implementation of WSSD	Para 7 and 24
Other Information	GOI budget
Contact	

Note *: *ex. Safe Drinking Water, Sanitation, Biodiversity, Ecosystem Conservation, Water Resources Management, Disaster Prevention, etc.*

TABLE 6.4

Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	<i>Water for Food and Rural Development</i>
Actor(s) [Nation (Ministry Agency)/Organization]	Ministry of Agriculture INDONESIA
Partner(s)	
Title	National Food Security Program
Objective	To fulfill national food staple demands in qualitatively and quantitatively sufficient, safe, equitable, and reachable manners
Contents	to maintain self-sufficiency in food production through maintaining foods availability, food buffer, and distribution to fulfill national food demands
Means of Implementation	<ul style="list-style-type: none"> • Controlling irrigated rice fields conversion to non-agricultural areas. • Optimization of the use of rain fed, swampy areas, and others • Rehabilitation and maintenance of irrigation schemes • Water conservation at farm levels. • Increase of quality of land intensification for agriculture. • Increase efficiency post harvest practice; • Food-nutrient diversification • Utilization of research and development product
Target Year	2003-2008
Target of agricultural productions	Rice 53 million ton; maize: 11.52 million ton and soybean 1 million ton for the whole Indonesia area
Expected outcome(s)	<ul style="list-style-type: none"> • Reduce rate of irrigated rice fields conversion to non-agricultural areas. • Increase the productive areas and increase of productivity of unit area. • Reduce production loss • Increase foods production and increase of farmer's income • Increase efficiency of agricultural water use
Relevance to the plan of Implementation of WSSD	Para 38
Other Information	
Contact	

Note *: *ex. Safe Drinking Water, Sanitation, Biodiversity, Ecosystem Conservation, Water Resources Management, Disaster Prevention, etc.*

TABLE 6.5

Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	<i>Water for Food and Rural Development</i>
Actor(s) [Nation (Ministry Agency)/Organization]	Ministry of Settlement and Regional Infrastructure Directorate General of Water Resources INDONESIA
Partner(s)	World Bank
Title	Improved Irrigation Management and Agricultural Productivity
Objective	<ul style="list-style-type: none"> • Initiate capacity-building process for legally empowered and self-financing community irrigation associations. • Initiate capacity building process to improve irrigation agency services and participatory management performance. • Improved fiscal sustainability of public irrigation schemes • Initiate capacity building for an <i>Integrated irrigated agriculture support program</i> that increases productivity and raises family incomes by coordination of agricultural support services and a micro-credit program based and a micro-credit program based on WUA Credit group
Contents	<ul style="list-style-type: none"> • <i>Initiate a capacity building program for governance scheme by legally empowered and self-financing water user association federations</i> that: (i) play a governing role in formation of scheme management policy, scheduling of bulk water deliveries, setting priorities for O&M and rehabilitation investments, collecting farmer fee contributions and settling disputes; and (ii) take over full management for O&M of secondary (and larger) canal networks. • <i>Initiate a capacity building process for improving irrigation agency participatory irrigation management performance</i> by: (i) using improved management control for irrigation network rehabilitation based on quality assurance and asset management procedures and, sustained operation of a MIS to monitor maintenance performance; and (ii) redefining their role and responsibilities to include participatory design and construction and, technical and financial assistance water user association federations. • <i>Achieving fiscal sustainability in irrigation financing by:</i> (i) transfer of canal network maintenance responsibility to WUAFs; (ii) establishing KIIFs for rehabilitation of canals under WUAF management and based on matching contributions from WUAF members; and (iii) requiring matching contributions from WUAFs to obtain O&M grants from Kabupaten governments. • <i>Initiate capacity building for an irrigated agriculture support program</i> consisting of: (i) an inter-agency Kabupaten Task Force to promote an integrated approach to agricultural support and linked to other Bank-supported Programs (e.g. Decentralized Agricultural & Forestry Extension Project and Kecamatan Development project), and (ii) establishing an "open menu" demand-based Agricultural Support Loan Facility for WUAs, operated by elected WUA Credit Management Units and overseen by the Kabupaten Task Force and Kabupaten Irrigation Council.
Means of Implementation	The program would be implemented from CY 2003 to CY 2013

2/3

	<p>with a three- phase Adjusted Program Loan (APL) of the World Bank.</p> <p><i>Phase I (Initial Capacity-Building Stage)</i> lasting about 3.5 years would help GoI and the regional governments to develop capacity-building program needed to strengthen the WATSAP institutional framework in five Java provinces (and their eligible district/kabupaten). The Phase I activities would include:</p> <ol style="list-style-type: none"> 1. completion of regional legislation and implementation guidelines in line with regional needs and policies; 2. preparation and introduction of relevant capacity building programs for improvement of governance, fiscal sustainability and quality assurance in water resources and irrigation management; and 3. prepare/finalize capacity-building program for WUA federation office holder and implement Kabupaten Irrigation Improvement Fund (KIIF) and related WUA financial assistance programs; 4. developing the APL for Phase 2 project. <p><i>Phase II (Expansion Stage)</i> program would be adjusted based on experienced Phase 1 and would expand to larger number of irrigated kabupaten along with increasing the scope and complexity of planning, programming and budgeting for the investment components of sector support program in selected basins.</p> <p><i>Phase III (Consolidation Stage)</i> would further expand Water Resources Sector Reform and institutionalize its innovations as a sustainable modus operandi within GoI.</p>
Target Year	<p>2003-2013 for the whole phases</p> <ul style="list-style-type: none"> • Phase 1: 2003-2007 • Phase 2: 2007-2011 • Phase 3: 2011-2013
Target Area/Place	<ul style="list-style-type: none"> • Phase 1: 5 provinces in Java (and their eligible district/kabupaten) and 6 provinces outside Java • Phase 2: expansion to other provinces and kabupatens • Phase 3: to whole provinces and eligible districts
Expected outcome(s)	<p>Improved Irrigation Management and Agricultural Productivity:</p> <p>a. <i>Capacity building for WUAs:</i></p> <p>100% of public irrigation schemes (area of H ha) are governed by IP3A in partnership with Kabupaten Government: at least 60% of secondary canal service areas are under WUAF management (area of L ha); private service providers are increasingly involved in WUA federation operations.</p> <p>b. <i>Capacity building for irrigation agency services:</i></p> <ol style="list-style-type: none"> i) Increase of V ha reliability irrigated in J public irrigation schemes. ii) ERR (Economic Rate of Return) of economic benefits based on: (1) cropping intensity increased by D% in project schemes, (2) expected economic savings through longer structural life. iii) Service orientation established with better farmer-agency relationship <p>c. <i>Fiscal sustainability of public irrigation schemes:</i></p> <ol style="list-style-type: none"> ii) Government scheme rehabilitation investment expenditures for J irrigation schemes is reduced by R through KIIF by matching contribution from WUAs; iii) Government O&M budget for T ha of networks

	<p>transferred to WUA management in H schemes is rec 3/3 by K%;</p> <p>iv) Government O&M expenditures reduced by E% in L Kabupaten.</p> <p>d. <i>Capacity building for an integrated irrigated agriculture support program:</i></p> <p>ii) Higher farm income in J irrigated Kabupaten affecting D farm families through WUAF focused Kabupaten and Kecamatan programs.</p> <p>iii) ERR of economic benefits based on: (1) income from higher value crops and higher rice yields; (2) improved farm gate prices due to market access information; (iii) greater use of Integrated Pest Management and fertilizers due to short-term credit access; (iv) higher horticultural crop quality and prices due to on-farm improvements, and post-harvest village infrastructure and enterprises</p>
Relevance to the plan of Implementation of WSSD	Para 38
Other Information	
Contact	<p>Directorate Water Resources Management Ministry of Settlement and Regional Infrastructure Phone: 62-21-7247807; Fax: 62-21-7221907 Kompleks Dep. KIMPRASWIL Gedung VIII Jalan Patimura No. 20, Jakarta, 12110 INDONESIA</p>

Note *: ex. Safe Drinking Water, Sanitation, Biodiversity, Ecosystem Conservation, Water Resources Management, Disaster Prevention, etc

TABLE 6.6

Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	<i>Water Pollution Prevention and Ecosystem Conservation</i>
Actor(s) [Nation (Ministry Agency)/Organization]	Ministry of Settlement and Regional Infrastructure Directorate General of Water Resources INDONESIA
Partner(s)	GEF, JICA, UNDP
Title	Study on Master Plan of Counter Measures for Critical Rivers and Lakes in Indonesia
Objective	<ul style="list-style-type: none"> to inventory current condition of critical catchments and lakes in Indonesia to identify and recommend a short and long term (master plan) counter measures for conservation of critical catchments and lakes that contain structural measures and non-structural measures. to recommend priority of implementation of counter measures on critical lake and rivers based on the finding of inventory and identification of counter measures (point a and b above). to prepare general guidelines and principal based for participatory ecosystem watershed including water resources infrastructures management.
Contents	<ul style="list-style-type: none"> Inventory and consolidation of any existing studies and works on critical catchments and lakes Inventory current condition of critical rivers catchments and lakes through the use of satellite imagery Conduct site survey on river catchments and lakes based on the finding of a) and b) activities Identification and recommendation of a short and long term (master plan) counter measures ("structural measures and non-structural measures") for conservation of rivers catchment, rivers and lakes. Prioritization of implementation of structural and non-structural counter measures on critical rivers and lakes Preparation of action plan of joint actions for participatory ecosystem-based on catchment conservation and management approach
Means of Implementation	<ul style="list-style-type: none"> Submission of project proposal to JICA Project preparation, i.e., approval of Term of Reference, approval from donor agency for commencement of the project, etc Procurement of consulting service Implementation of the project, include public consultation and encouragement of public participation
Target Year	2004-2005
Target Area/Place	65 very critical rivers and 30 critical lake and reservoirs located scattered in all over Indonesia
Expected outcome(s)	<ul style="list-style-type: none"> General inventory for super critical basin including its criteria will be used as a guidance in preparing a water resources conservation programs. Recommendation an 2/2 ion of implementation of structural and non-structural counter measures on critical rivers and lakes will be used as an implementation guidance. Water resources would be managed on the basis of river or drainage basins in an integrated manner, with a continued and deliberate effort to maintain and restore ecosystem functioning within both catchments and the coastal and marine ecosystems;

	<ul style="list-style-type: none"> • A participatory catchment management approach addresses not only the issues of natural resources conservation and management, pollution control and sustainable agriculture, but also the concerns of governments and local populations such as poverty alleviation
Relevance to the plan of Implementation of WSSD	Para 35 protecting ecosystem and natural resources management
Other Information	
Contact	Directorate Water Resources Management Ministry of Settlement and Regional Infrastructure Phone: 62-21-7247807; Fax: 62-21-7221907 Kompleks Dep. KIMPRASWIL Gedung VIII Jalan Patimura No. 20, Jakarta, 12110 INDONESIA

Note *: *ex. Safe Drinking Water, Sanitation, Biodiversity, Ecosystem Conservation, Water Resources Management, Disaster Prevention, etc.*

TABLE 6.7

1/1

Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	<i>Water Pollution Prevention and Ecosystem Conservation</i>
Actor(s) [Nation (Ministry Agency)/Organization]	State Ministry of Environment, Ministry of Settlement and Regional Infrastructure, Ministry of Forestry, LIPI, BIOTROP, PLN INDONESIA
Partner(s)	ProLH GTZ, UNDP, GEF, JICA
Title	Conservation and Management of Lakes Programme
Objective	<ul style="list-style-type: none"> • Sustainable use of Lakes • Control pollution and conserve water resources and rehabilitate the physical condition of lakes • Conservation of lake environments
Contents	<ul style="list-style-type: none"> • Clean Lake Programme • Conservation of catchment/watershed/river basin levels • Rehabilitation and restoration of degraded Lake Ecosystems • Establishing Indonesian Lakes Forum • Strategy and Action Plan for Lakes Management
Means of Implementation	<ul style="list-style-type: none"> • Establishing Clearing House Mechanism (Coordination with all relevant stakeholders in national and regional levels) • National Lakes Data Base (Inventory, Assessment, and Monitoring Lake Management/Restoration) • Lakes Research and Development • Monitoring & Evaluation of Policy Implementation on lake/river basin
Target Year	2003-2007
Target Area/Place	<ul style="list-style-type: none"> • National • Lake Rawa Pening, Lake Batur, Lake Toba, Lake Tempe, Lake Limboto, Lake Singkarak (in province of Central Java, Bali, North Sumatera, South Sulawesi, Gorontalo, West Sumatera respectively)
Expected outcome(s)	<ul style="list-style-type: none"> • To create and strengthen partnerships among stakeholders working on lakes • Promote integrated water resources management of lake and river basin systems
Relevance to the plan of Implementation of WSSD	Para 7, 23, 24
Other Information	
Contact	Deputy for Environmental Conservation Ministry of Environment Indonesia KLH "B" Bld., Jl DI Panjaitan Kav 24 Kebon Nanas Jakarta Timur 13410 Indonesia Phone/fax. 021-8580111, e-mail: dokie@cbn.net.id INDONESIA

Note *: *ex. Safe Drinking Water, Sanitation, Biodiversity, Ecosystem Conservation, Water Resources Management, Disaster Prevention, etc.*

TABLE 6.8

Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	Disaster Mitigation and Risk Management
Actor(s) [Nation (Ministry Agency)/Organization]	Ministry of Settlement and Regional Infrastructure Directorate General of Water Resources INDONESIA
Partner(s)	ADB
Title	Flood Management in Selected River Basins in Java
Objective	<p>this TA (Technical Assistance) of ADB is to prepare an investment project for flood management in selected basins in Java:</p> <ul style="list-style-type: none"> • identify the most appropriate flood management strategy to support the comprehensive flood management plan for the basins in Java; • strengthen the capacity for Integrated River Basin Management (IBRM); • select the most appropriate river basin in Java and prepare a feasibility study for at least two representative river basins; • formulate a project for improved flood management of the basins in Java
Contents	<ul style="list-style-type: none"> • provide a clear overview of the Government's flood management strategies, priorities, and investment plans; • assess the completeness and adequacy of the existing flood management plan for the basins based on technical, institutional, environmental, social, economic, financial, and other relevant factors; • formulate recommendation, as appropriate, for adjustment of the plan, and for institutional strengthening, improvement of coordination, legislative reforms, financing, cost recovery, and standardizing the justification of proposed works; • institutionalize participatory approaches into selection and formulation of flood control measures; • formulate a watershed management plan in the basin; • help to integrate sound environmental management and increased social awareness into planning into the planning, design, and implementation of flood management; etc
Means of Implementation	The TA will be implemented in two phases over the total period of seven months, the first phase of three months followed by the second phase of four month. The consultant working in close association with the Bappenas and the Ministry of Settlements and Regional Infrastructure will review and assess the current Government's flood management plan/activities,

	appropriate institutional setting for flood manager plan and will select at least two model river basins for feasibility study to be carried out in the second phase	1/2
Target Year	2003	
Target Area/Place	Java island	
Expected outcome(s)	three reports are expected (inception, interim and final)	
Relevance to the plan of Implementation of WSSD	Para 35	
Other Information		
Contact		

Note *: ex. *Safe Drinking Water, Sanitation, Biodiversity, Ecosystem Conservation, Water Resources Management, Disaster Prevention, etc.*

TABLE 6.9

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Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	Disaster Mitigation and Risk Management
Actor(s) [Nation (Ministry Agency)/Organization]	Ministry of Settlement and Regional Infrastructure Directorate General of Water Resources INDONESIA
Partner(s)	JBIC
Title	Development of Flood Control Measures In Strategic Area
Objective	<p>this proposed soft loan of JBIC is to fund some investment projects for flood management in selected strategic river basins :</p> <ul style="list-style-type: none"> • consolidate and review the feasibility study and the detailed design of the most appropriate flood control measures to support the comprehensive flood management plan for the strategic river basins; • construction of flood control measures to reduce risks and mitigate flood hazard; • strengthen the capacity for Integrated River Basin Management (IBRM)
Contents	<ul style="list-style-type: none"> • Jakarta-Bogor-Depok-Tangerang-Bekasi (JABODETABEK) area: a) review and detailed design of adopted measures, b) improvement of Banjir Kanal Barat, c) construction of Banjir Kanal Timur, d) river normalization of 13 rivers, e) construction of adopted measures in a) such as reservoirs at upstream Ciliwung and Cisadane, etc, and d) installment of flood warning system; • Medan and surrounding area: implementation of Medan Flood Control Phase II; • Semarang and surrounding area: a) improvement of Banjir Kanal Barat and Banjir Kanal Timur, b) construction of polder systems in lower areas, and c) construction of Jatibarang dam at Kreo river
Means of Implementation	<ul style="list-style-type: none"> • Master Plan of flood control measures in JABODETABEK, Medan and Semarang areas including detailed design of some measures had been studied by JICA's technical assistance some years ago, however due to recent development in the areas some of flood control measures need to be reviewed before construction started; • Some of flood control measures for JABODETABEK and Medan areas that are included in Phase I has been included in on going loan, i.e., IP 496 for JABODETABEK area and IP 495 for Medan area; • This proposed program covers the proposal of implementation of Phase II for JABODETABEK and Medan areas and the proposal of Phase I for Semarang area.
Target Year	<ul style="list-style-type: none"> • JABODETABEK area: 2/2 008 (tentative) • Medan area: 2004-2009 (tentative)

	• Semarang: 2004-2009 (tentative)
Target Area/Place	JABODETABEK, Medan, Semarang and their surrounding areas
Expected outcome(s)	reduce and mitigate of flood risks and hazard on targeted areas
Relevance to the plan of Implementation of WSSD	Para 35
Other Information	
Contact	

Note *: *ex. Safe Drinking Water, Sanitation, Biodiversity, Ecosystem Conservation, Water Resources Management, Disaster Prevention, etc.*

TABLE 6.10

Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	B. Disaster Mitigation and Risk Management
Actor(s) [Nation (Ministry Agency)/Organization]	Indonesian institution: Ministry of Settlement and Regional Infrastructure, State Ministry of Research and Technology, BPPT, LAPAN, BMG, BAKOSURTANAL, and State Ministry of Environment Metrology Organization: WCRP/WMO, IPCC, NOAA Satellite Organization: CEOS, NASA, ESA, EC
Partner(s)	Metrology Organization: WCRP/WMO, IPCC, NOAA Satellite Organization: CEOS, NASA, ESA, EC
Title	Capacity Building, Sharing Information and Creating Networks on Disaster Management (Change of Global-Regional Water Cycle)
Objective	<ul style="list-style-type: none"> • Provide scientific knowledge and technological basis on improved forecast of hazard occurrence and associated predictions of intensity, with greater precision at regional or local level and establish disaster reduction strategy/initiatives. • Establish water resources management for sustainable development in order to avoid or minimize the effect of change of water supply/demand and water-cycle on human society. • Propose sustainable and preferable methods based on these knowledge and basis for water management. • Shared the information collected by the methods with the countries that are faced by serious water problems.
Contents	<ul style="list-style-type: none"> • Development of precise hazard (floods, lands slides, tsunami, cyclone, earth quake, etc) forecast and establishment disaster reduction strategy. • Regional "global warming"/water cycle program: establish regional water cycle observation program which enables mutual use of the observation data through the promotion of systematic observation such as satellite/ocean observation, land investigation and monitoring. • Development of water cycle change model. Develop model forecast the change of water cycle due to the changes of water resources demand/supply, climate changes/global warming, etc. • Evaluation of social effects. Implement quantitative evaluation of the influence to food, water resources, ecosystem, human health, society, economy, etc. based on the environmental change forecast due to the change of water-cycle. • Integrated policy evaluation program. Implement the evaluation on the applicability of the existing technology developed present countermeasure scenario in order to develop and desirable water management.
Means of Implementation	<p>i) Establishment of integrated scientific committee for multi-sector efforts</p> <p>ii) Coordination among international organizations Observation/monitoring of land, sea, and air</p> <p>iii) Integrated format database</p> <p>iv) Data distribution and sharing framework</p> <p>v) Capacity building and training program for data use</p>

Target Year	i), ii) & iii) 2007; iv) & v) 2012
Target Area/Place	Regional (ASEAN); Indonesia
Expected outcome(s)	Reliable forecast of climate related hazards ii) Comprehensive disaster reduction strategy iii) Create national water resources management plan iv) Increase the population of people provided safe drinking water v) Reduce death from floods
Relevance to the plan of Implementation of WSSD	Para 7, 24, 25, 26, 27, 28, 99 (e)
Other Information	
Contact	Directorate Water Resources Management Ministry of Settlement and Regional Infrastructure Phone: 62-21-7247807; Fax: 62-21-7221907 Kompleks Dep. KIMPRASWIL Gedung VIII Jalan Patimura No. 20, Jakarta, 12110 INDONESIA

Note *: *ex. Safe Drinking Water, Sanitation, Biodiversity, Ecosystem Conservation, Water Resources Management, Disaster Prevention, etc.*

TABLE 6.11

Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	C. Water Resources Management and Benefit Sharing
Actor(s) [Nation (Ministry Agency)/Organization]	Ministry of Settlement and Regional Infrastructure (Directorate General of Water Resources) and The State Ministry of Environment
Partner(s)	World Bank
Title	Improved Water Resources Sector Performance
Objective	<ul style="list-style-type: none"> • Initiate capacity-building process for improved governance and accountability in sector management agencies; • Initiate capacity building process for improved basin agency management performance in discharging of their mandates and responsibility; • Initiate program for achieving fiscal sustainability, and • Improved water demand management and water resources conservation in project basin
Contents	<p>(e) <i>Initiate a capacity building program for governance and, accountability</i> in sector management agencies focusing on: (i) strengthening the National Water Council Secretariat; (ii) developing the understanding and capabilities of Provincial and River Basin Councils to influence agency policies, planning and management decisions; (iii) developing the water resources sector understanding of provincial and Kabupaten parliaments; (iv) developing public awareness through public consultation in the preparation of Basin Water Resources Management Plans (BWRMPs); and (v) developing and piloting a water use right system.</p> <p>(f) <i>Initiate a capacity building process for improved basin agency management</i> in discharging of their mandates and responsibility by: (i) developing management controls based on quality assurance and asset management; (ii) development and use of an inter-agency management information system (MIS) for management decision-support; and (iii) supporting the strengthening of management in new River Basin Corporations (RBCs) in highly-developed river basins.</p> <p>(g) <i>Initiate a program for achieving fiscal sustainability</i> by: (i) establishing new mechanisms to increase cost recovery for water service and reduce the fiscal burden of infrastructure maintenance; (ii) using economic instruments to cover costs of water quality monitoring and construction of wastewater treatment facilities; (iii) use of cost-effective criteria and cost accounting in agency programming and budgeting; (iv) improving the revenue of RBCs from their water service; and (v) reducing surplus staff numbers, fostering public-private partnership and greater out-sourcing of agency operations.</p> <p>(h) <i>Improved Water Demand Management and Water Conservation in Project Basins</i> by: (i) allocating and conjunctively managing water resources more equitably and sustainably; (ii) conserving surface and groundwater resources; (iii) establishing the National Water Quality Monitoring Network and strengthening the new institution for improving the reliability of hydrological data; and (iv) developing a framework for strategic allocation of limited infrastructure development funds between urban water supply, irrigation, water quality management and flood control needs.</p>
Means of Implementation	<p>The program would be implemented from CY 2003 to CY 2013 with a three- phase Adjusted Program Loan (APL) of the World Bank.</p> <p><i>Phase I (Initial Capacity-Building Stage)</i> lasting about 3.5 years would help GoI and the regional governments to develop capacity-building program needed to strengthen the WATSAP institutional framework in five Java provinces (and their eligible district/kabupaten). The Phase I activities would include: (a) completion of regional legislation and implementation guidelines in line with regional needs and policies; (b) preparation and introduction of relevant capacity building programs in 2/3 of governance, fiscal sustainability and quality assurance in water resource management; (c) support initial implementation of basin water quality management through river basin corporations in one or two river basins; (d) pilot implementation of water use rights and decision-support/MIS programs in 3 program provinces; and (e) support river basin operational management and river infrastructure programs in program provinces.</p> <p><i>Phase II (Expansion Stage)</i> program would be adjusted based on experienced Phase 1 and would expand to larger number of river basins along with increasing the scope and complexity of planning, programming and budgeting for the investment components of sector support program in selected basins.</p> <p><i>Phase III (Consolidation Stage) would further expand Water Resources Sector Reform and institutionalize its innovations as a sustainable modus</i></p>

	operandi within Gol.
Target Year	2003-2013 for the whole phases <ul style="list-style-type: none"> Phase 1: 2003-2007 Phase 2: 2007-2011 Phase 3: 2011-2013
Target Area/Place	<ul style="list-style-type: none"> Phase 1: 5 provinces in Java (and their eligible district/kabupaten) and 6 provinces outside Java Phase 2: expansion to other provinces and river basins Phase 3: to whole provinces and eligible districts
Expected outcome(s)	<p>Improved Water Resources Sector Performance:</p> <p>a. <i>Improve water allocation, water quality and water conservation in Project Basins:</i> Economic Rate of Return (ERR) based on: (i) losses prevented through completing river infrastructure repairs; (ii) increase in dry season water allocation to non-consumptive uses and downstream users; (iii) incremental average flood damages prevented ; and (iv) reduced raw water treatment costs.</p> <p>b. <i>Initiate a management capacity building process for sector water resources agencies:</i></p> <p>(i) Two/three RBC's become effective as service providers & cost recovery agents; G Balai PSDAs have good management, funding and fully operations and investment based on BWRMPs.</p> <p>(ii) For X Dinas PUP and Y Balai PSDA, unit costs of Balai PSDA operation are available; maintenance cost estimate and structure replacements value needs known; technical and management audits indicate likely improvement in construction quality and contract management; annual work programs based on cost-effective priorities; improved inter-agency coordination.</p> <p>(iii) Output from MIS increasingly used for decision support, Balai PSDA operation</p> <p>(iv) Reduction in costs of hydrology operations</p> <p>(v) X BWRMPs adopted by V DPRDs and Provincial Water Resources Councils</p> <p>c. <i>Initiate process to improve sector fiscal sustainability:</i></p> <p>i) Present Value of increased revenues Z RBCs covers estimated operational costs; earmarked provincial revenue covers Y% of Balai PSDA operating costs; Effluent discharge fee revenue covers X% of industrial pollution monitoring costs in W basins;</p> <p>ii) Results-oriented annual work programs being prepared for Z Dinas PUP and Y Balai PSDAs;</p> <p>iii) Reduction in surplus staff numbers reduces personnel costs by Z %.</p> <p>d. <i>Initiate capacity building process for sector governance institutions:</i></p> <p>i) National Water Council and its Secretariat functioning satisfactorily in setting national policies, resolving sector issues and promoting inter-agency coordination.</p> <p>ii) Improved sustainability and transparency as all policy decisions about water rights, water allocation, management and pollution control are under the scrutiny of X Provincial and Y Basin Water Councils.</p> <p>iii) Provincial parliaments are more sympathetic to adequate O& 3/3 eds.</p>
Relevance to the plan of Implementation of WSSD	Para 25, 26, 27, and 28
Other Information	
Contact	Directorate Water Resources Management Ministry of Settlement and Regional Infrastructure Phone: 62-21-7247807; Fax: 62-21-7221907 Kompleks Dep. KIMPRASWIL Gedung VIII Jalan Patimura No. 20, Jakarta, 12110 INDONESIA

Note *: ex. Safe Drinking Water, Sanitation, Biodiversity, Ecosystem Conservation, Water Resources Management, Disaster Prevention, etc.

TABLE 6.12

Submission form for the Portfolio of Water Actions

Sectoral Topic (Note*)	D. Water Resources Management and Benefit Sharing
Actor(s) [Nation (Ministry Agency)/Organization]	Indonesian Water Partnership (IWP) International organizations: FAO, IFAP, GWP, ICID, IUCN, IWMI, UNEP, WHO, WWC and WWF
Partner(s)	International organizations: FAO, IFAP, GWP, ICID, IUCN, IWMI, UNEP, WHO, WWC and WWF
Title	Dialogue on Food, Water and Environment
Objective	<ul style="list-style-type: none"> • Long term objective: Improve water resources management for food security and environmental sustainability with a special focus on the reduction of poverty and hunger and the improvement of human health. • Intermediate objective: Build bridges between agricultural and environmental communities on water resources issues by improving the linkages between the sectoral approaches that dominate policy making and implementation, particularly at national level. • Immediate objective: Establish a dialogue that will produce tangible solution for the seemingly conflicting interests of water for food and environment, primarily at national and local levels and draw together, maintain and improve the required knowledge base for the Dialogue. Identify best practices and raise awareness amongst the relevant actors and stakeholders
Contents	<p>i) <i>Preparatory phase</i> (at national level) that consist of the following activities: establishment of a small coordinating unit, preparation of Dialogue proposal, training of the trainers, establishment of dialogue agenda, and preparation of dialogue materials such background study/situation analysis on: i) assessment on water availability (water balance) and water sustainability by islands or river basins, ii) assessment on food demand for various scenarios up to 2025, iii) assessment watersheds/river catchments (including river, lake, and groundwater) degradation, iv) assessment of water demands for people, food, environment, and industry for various scenarios (what if scenario) up to 2025, and v) study on identification of conflicts (agriculture vs environment, etc) to be discussed in dialogue.</p> <p>ii) <i>Implementation phase</i> (at national, provincial and river basin levels) that consist of the following activities: a number of Dialogue on Water, Food and Environment at provincial and river basin level where there are potential conflicts between water for food and the environment. This will culminate in a Dialogue at the national level to draw up the recommendations for policies and programs on water for food and environment. The results and recommendations of the Dialogue shall be submitted to the Government for their consideration and appropriate action; and</p> <p>iii) <i>Plan for Follow –up Actions</i> (at national, provincial and river basin levels) consisting of institutionalizing of the Dialogue results and recommendations in the form of adopted regulations, policies and programs and establishment of performance indicators and monitoring process.</p>

Means of Implementation	<p>The Dialogue on Water, Food and Environment is designed as a cross-sectoral dialogue process amongst stakeholders, primarily at national and local levels, that is transparent, inclusive and solution oriented. Indonesia Water Partnership (IWP) in cooperation with National Development Planning Agency (BAPPENAS) and Ministry of Settlement and Regional Infrastructure will convene the Dialogue that will implemented in 3 (three) phases as follows.</p> <p>a) Preparatory phase:</p> <p>1.1 Preparation activities:</p> <ul style="list-style-type: none"> • Start-up actions/formation of a small coordinating unit • Preparation of the Dialogue Proposal • Training of trainers (funded by the Dialogue Secretariat) • Preliminary workshops for identification of key issues, problems and agenda of dialogue. <p>1.2 Preparation of dialogue materials:</p> <ul style="list-style-type: none"> • Four (4) background studies and one (1) situation analysis. Funding for these studies will be requested to the interested 10 international organizations. <p>b) Implementation phase:</p> <ul style="list-style-type: none"> • Series of workshop at 15 river basins; 10 provinces and 3
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	<p>national levels.</p> <p>c) Plan for Follow –up Actions:</p> <ul style="list-style-type: none"> • Adoption of regulations, policies and programs and establishment of performance indicators and monitoring process.
Target Year	2003-2005
Target Area/Place	15 inter-provincial river basins and 10 provinces
Expected outcome(s)	The immediate outcomes would be the (i) adoption of the appropriate basic policies and programs on water for food and environment, and (ii) institutionalization of the process for resolving issues on water for food and the environment. The results of the Dialogue process shall be documented in the form of Proceedings for distribution to all concerned. The ultimate outputs of the Dialogue (in the long run) will be: i) success of food security programs; ii) removal of threats on water availability and sustainability; iii) recovery of degraded watersheds/river catchments; and iv) sound management of floods and droughts
Relevance to the plan of Implementation of WSSD	Para 25, 26, 27, and 35
Other Information	
Contact	<p>Indonesian Water Partnership Phone:62-21-7247807 Fax: 62-21-7398604; E-mail: s_sutardi@hotmail.com Kompleks Dep. KIMPRASWIL Gedung IX Jalan Patimura No. 20, Jakarta, 12110 INDONESIA</p>

TABLE 6.13 : LIST OF PROJECT PROPOSAL

NO	PROGRAM	SCOPE OF WORKS	TOTAL COST	DEVELOPMENT PROGRAM	PROSPECTIVE DONOR
1.	Water Pollution Control in Leather Tanning Small Scale Industry in Sukaregang, Garut, West Java.	<ul style="list-style-type: none"> • Construction and Rehabilitation of Waste Water Treatment System to Increase Water Quality • Empowering and Increasing Small Scale Enterprises (SME) Awareness to Environment • Capacity Building for Local Government in Managing the Environment • Utilization of Waste 	US\$ 3,3 Million	<ul style="list-style-type: none"> • Environment • Poverty Eradication • Good Environmental Governance 	Canada, Germany, France and Spain
2.	Water Pollution Control in Batic Small Scale Industries in Pekalongan, Central Java	<ul style="list-style-type: none"> • Study Activities • Program Socialization • Education and Training • Construction of Wastewater Treatment Facilities and its Management • Capacity Building for Local Government in Managing Environment 	US\$ 600.000	<ul style="list-style-type: none"> • Environment • Good Environmental Governance 	Canada, Germany, France and Spain
3.	Utilization of Coconut Shell Waste into Economic	<ul style="list-style-type: none"> • Construction of Coconut Shell Waste 	US\$ 750.000	<ul style="list-style-type: none"> • Poverty Eradication 	Canada, Germany, France and Spain

NO	PROGRAM	SCOPE OF WORKS	TOTAL COST	DEVELOPMENT PROGRAM	PROSPECTIVE DONOR
	Products in North Sulawesi	Utilization <ul style="list-style-type: none"> • Local Community Awareness to Environment Protection • Empowering Local Community Skills in Utilizing Waste • Capacity Building for Local Institution 		<ul style="list-style-type: none"> • Reduce Solid Waste to Environment • Good Environment Governance 	2/4
4.	Food Security and Poverty Eradication of Farmers in 24 Provinces	<ul style="list-style-type: none"> • Rural Irrigation Improvement/Rehabilitation • Small Ponds Construction in Farming Area for Drought Mitigation • Local People Participation for Increasing Income 	US\$ 34 Million	<ul style="list-style-type: none"> • Food Security • Poverty Eradication • Water Conservation 	Canada, Germany, France and Spain
5.	Upland Irrigation Development Through Participatory Approach in 6 (Six) Provinces	<ul style="list-style-type: none"> • Provide Irrigation Facilities in the Upland Areas by Developing Surface and Subsurface Water Resources by Participatory Approach • Provide Appropriate Upland Irrigation Technology for Developing High Value Economic Crops being Suitable With The Local 	US\$ 640.000	<ul style="list-style-type: none"> • Poverty Eradication 	Italy, Sweden and Finland

NO	PROGRAM	SCOPE OF WORKS	TOTAL COST	DEVELOPMENT PROGRAM	PROSPECTIVE DONOR
		Agroclimatic Condition and Market Demand			
6.	Rain-fed Development for Horticultural Production Through Shallow Groundwater and Small Ponds Development in 6 (six) Provinces,	<ul style="list-style-type: none"> Transfer Micro Irrigation Technique on Survey, Investigation, Design (SID), Construction, Water Management, Farming Management and Institutional Strengthening Disseminate Rain-fed Micro Irrigation Farming to Neighboring Areas 	US\$ 1 million	<ul style="list-style-type: none"> Poverty Eradication 	Italy, Sweden and Finland
7.	Revitalization of Small Reservoirs (Situ-situ) in Jakarta, Bogor, Depok, Tangerang, Bekasi (JABODETABEK) Area.	<ul style="list-style-type: none"> Rehabilitation and Management of Small Reservoirs.(100 units) People Participation Public Awareness Arising Utilization of Small Reservoirs . Strengthening of Institutions. 	US\$ 75 Million	<ul style="list-style-type: none"> Environment Water Resources Conservation. Poverty Eradication 	Italy, Sweden, Finland, Canada, France, and Spain 3/4
8.	Improvement of Small Scale Groundwater Development in dry area (7 provinces)	<ul style="list-style-type: none"> Improvement and rehabilitation of groundwater pumps and it's facilities 	US\$ 10 million	<ul style="list-style-type: none"> Poverty Eradication Food security 	Canada, France, and Germany

NO	PROGRAM	SCOPE OF WORKS	TOTAL COST	DEVELOPMENT PROGRAM	PROSPECTIVE DONOR
		<ul style="list-style-type: none"> Rehabilitation of Groundwater Irrigation canals Strengthening of water user's association and institution Farmer participation 			
9.	Improvement of Pro Poor Small Scale Irrigation Schemes in 7 Provinces	<ul style="list-style-type: none"> Construction and Rehabilitation of 17.000 ha Small Scale Irrigation Scheme Strengthening of Participatory Capacity of Water User Association 	US\$ 16 Million	<ul style="list-style-type: none"> Poverty Eradication Food security 	Canada, France, and Germany
10.	Provision of Rural Housing and Rural Environment Improvement in 17 Provinces	<ul style="list-style-type: none"> Construction of 3.750 Units Rural House Improvement of Rural Roads, Drainage and Sanitation for 45.700 Facilities 	US\$ 120 Million	<ul style="list-style-type: none"> Poverty Eradication Food security 	Canada, France, and Germany
11.	Provision of Drinking Water Supply for Urban and Rural Poor in 30 Provinces.	<ul style="list-style-type: none"> Construction of Water Supply System Provision of Water Supply Facilities Public Participation Strengthening of Water Use Institution 	US\$ 30 Million	<ul style="list-style-type: none"> Poverty Eradication 	Canada, Spain, France, Sweden and Germany

NO	PROGRAM	SCOPE OF WORKS	TOTAL COST	DEVELOPMENT PROGRAM	PROSPECTIVE DONOR
12.	Pollution Control in Upper Citarum Watershed in West Java.	<ul style="list-style-type: none"> Construction of Communal Domestic Wastewater Treatment Plant.(17 units) Construction of Centralized Wastewater Treatment Plant for Industry in South Cimahi 	US\$ 9 Million	<ul style="list-style-type: none"> Environment Poverty Eradication Water Resources Conservation. Education 	Spain, France, Canada, Italy, Sweden, Germany and I 4/4
13.	Conservation of Upper Citarum Watershed	<ul style="list-style-type: none"> Construction of Small Ponds (6 units), Check Dams (20 units), Gully Plug (100 units), Ground Water Recharge.(100 units) Degraded Land and Forest Rehabilitation Environmental Public Awareness and Community Participation Strengthening of Institutions. 	US\$ 21.6 Million	<ul style="list-style-type: none"> Environment Poverty Eradication Water Resources Conservation. Education 	Spain, France, Canada, Italy, Sweden, Germany and Finland.
TOTAL COST			USD\$ 321.89 Million		

FOR DEBT SWAP SCHEME FOR INDONESIA'S DEVELOPMENT

