

WATER VISION 2025

SRI LANKA

H 25222 22

SRI LANKA NATIONAL WATER PARTNERSHIP

Prepared by the Water Resources Unit of the Lanka International Forum on Environment and Sustainable Development (LIFE-WRU) on behalf of the Sri Lanka National Water Partnership, in collaboration with the Water Resources Secretariat (WRS) and the International Water Management Institute (IWMI).

For details please contact:

Nanda Abeywickrema,
Director, LIFE-WRU
LIFE
10/1, De Fonseka Place
Colombo 5
Sri Lanka

Tel: (94) 075 353 573

Fax: (94-1) 580822

Email: wru_life@eureka.lk

Copyright © 2000 by LIFE-WRU. All rights reserved.

Cover photo by Sanjaya Senarath.

Water Vision 2025, Sri Lanka

Value of Water and IWRM

Sri Lanka is one of the few countries in the world that has had a thriving and vibrant civilization for over two thousand years, dating from the 6th Century BC, a civilization that left behind ruins, which are among the most amazing monuments of the ancient world. What is remarkable about this civilization is that it developed in the drier part of the country, based on a highly intricate system of irrigation. It required water storage, transfer of water over long distances, and complex systems of water distribution and management for agriculture, drinking and sanitation, and landscape gardening. Hence the concept of Integrated Water Resources Management (IWRM) appears to have been ingrained in our ancient society. The hydraulic society that was sustained over many centuries treated water with great respect and value and its use was regulated by edicts issued by the kings, as well as by customary rights and obligations determined by the community. The people observed these regulations willingly, as they became a part of their culture.

Treasure

Challenged by his son Kasyapa to reveal his hidden treasure, King Datusena, the builder of Kalawewa (459-477 AD), produced a handful of water from the reservoir and exclaimed, "This is My Wealth!"

After the decline of this irrigation-based civilization, much of the dry zone became depopulated, except for isolated villages that survived under small village tanks. Most of the people migrated to the wet zone of the island where the rainfall regime ensured water for the people. They established an economy and society adapted to an environment with plentiful water.

Following the establishment of British rule, the situation changed drastically. The forests in the wet zone were cleared to make way for coffee, tea, rubber and coconut plantations. The irrigated land settlement schemes as well as increasing population led to further clearing of forests. Now only 21 percent¹ of the land is under forest cover; in some areas in the hill country, it is less than 9 percent. Even though the clearing might not have affected rainfall, it has affected runoff, groundwater, and river flow regimes.

Moreover, since independence in 1948, irrigated land settlement in the dry zone increased greatly; clearing of forests for land settlement and *chena* cultivation also depleted groundwater resources by increasing runoff and evaporation. In this period, the population almost trebled to 19 million, 80 percent of it in the wet zone with the region in and around Colombo becoming the main concentration of urban population.

¹ *Integrated Water Resources Management in Sri Lanka*. Paper prepared by the Sri Lankan participants of the South Asia Regional Meeting of the Global Water Partnership, Colombo, May 1998.

WARNING!

Absolute Scarcity : ***Northern, North Central, North Western and Eastern Provinces and Hambanthota District***

Economic Scarcity: ***Kalutara, Galle, Kegalle and Kandy Districts***

Water Pollution : ***Beira Lake, Kelani River, Lunawa Lagoon, Negombo Lagoon, Kandy Lake, Colombo Canal System***

Look for warning signs on map (figure 1).

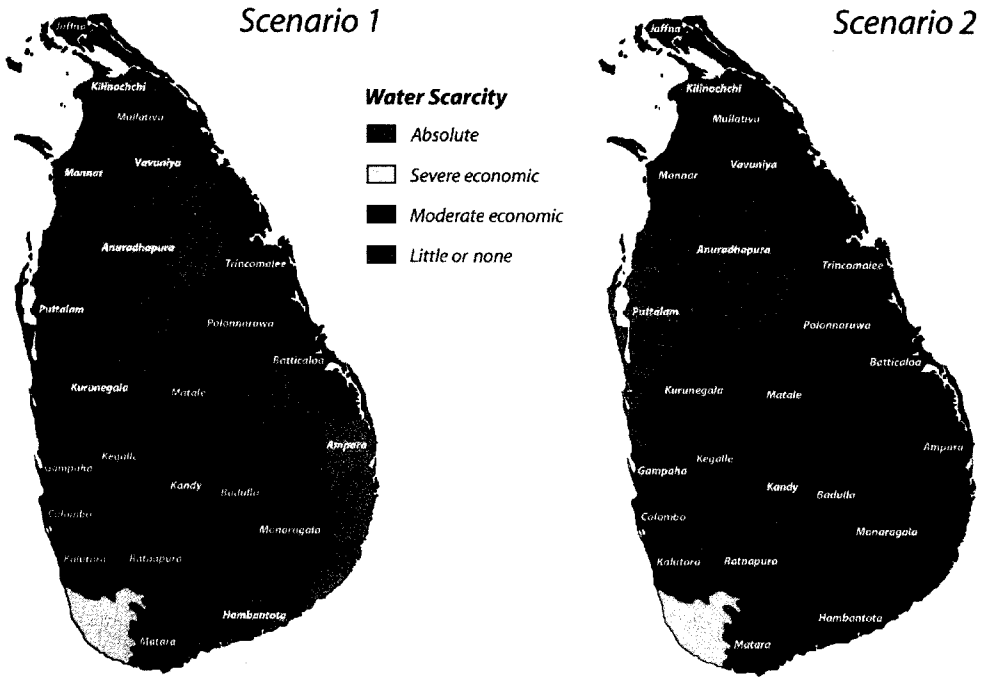
Fact and Fantasy

Sri Lanka has plentiful water resources in aggregate terms, but this overall picture is very misleading because there is a high degree of variation in the availability of water seasonally and regionally (figure 1).

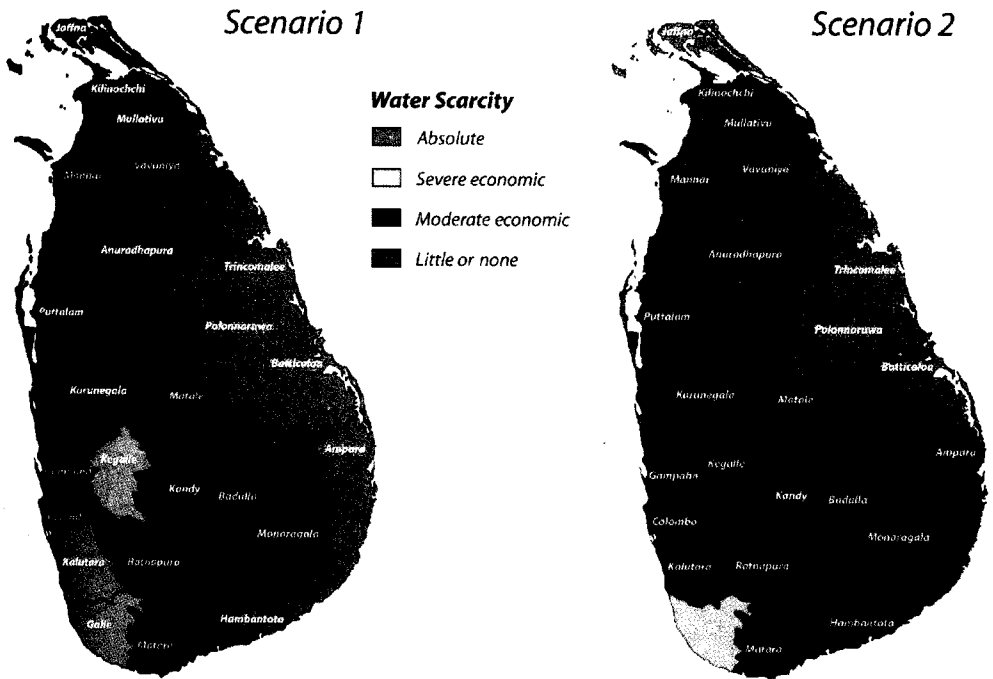
- Nearly two-thirds of the country gets less than 1,500 mm of rainfall in a year and almost all of it comes during the short northeast monsoon season from October to January.
- Of this, 51.1 percent escapes to the sea in spite of the large amount of water stored in large and small reservoirs.
- Storage shortages are being experienced already and the scope of increasing storage for future growth in demand is very limited and prohibitively expensive.
- Transfer of water from surplus to deficit areas is expensive, and social and environmental costs are high.
- A heavy public investment has been made to irrigate nearly 560,000 hectares of land in the dry zone. Irrigated agriculture, however, accounts for only 20 percent of the total agricultural production. Due to mainly water-intensive paddy cultivation on these lands and the wasteful use of the available water, which is provided free of charge, several irrigated areas face water stress, especially during the dry season. The irrigation intensity is only 130 percent as against a desirable 160-200 percent.
- The agreed rules (*Bethma*) for sharing water in scarce situations are limited to the irrigation sector while there is already competition for a limited supply of water by farmers and urban residents.

Figure 1: IWMI Indicator of Water Scarcity in 2025.

MAHA SEASON



YALA SEASON



Note: Scenario 1 assumes the same irrigation sector efficiency in 2025 as at present; Scenario 2 assumes a doubling of irrigation sector efficiency in 2025.

- The situation in the *wet zone* where 78.8 percent of the rainfall runoff escapes to the sea is much more favorable. Because rainfall is available throughout the year, storage is needed only for hydropower generation and urban use.
- The excessive concentration of urbanization and industrialization in and around Colombo has resulted in a severe drain on the Kelani Ganga and groundwater in the region, and caused water pollution.
- While Sri Lanka's population will stabilize at 23 million by 2025, urban population will increase from 30 percent to 60 percent creating tremendous pressures on water supply, and sanitation and sewage disposal in urban areas. This will be a major challenge to urban planners.
- Only 32 percent of the national population is served by pipe-borne water today, and only one-third of all the piped water supply schemes in the country has the capacity for providing a 24-hour water supply.¹
- Groundwater is increasingly tapped for agriculture and overexploitation is causing saline intrusion. These are only the warning signals of more critical issues related to water that would emerge unless we take steps to achieve a sustainable water scenario by 2025.
- Due to the enhancement of global warming (1.8-2.2 °C) Sri Lanka will experience a reduction in rainfall of 3 to 18 percent over the coming decades. The rise in sea level around Sri Lanka is estimated to range from 15 cm to 95 cm, the best estimate being 50 cm by the turn of this century. The biophysical impacts of these phenomena will directly impinge on water resources leading to their decline in general.
- Today, several agencies, both government and private, exploit water resources and each agency has its own agenda. This has led to wasteful use of water and human and financial resources, and even to conflicts between legitimate competitive users.
- Major policy decisions and strategies to manage the available water resources in an integrated and sustainable manner are an urgent necessity. Given the fragmented approaches in the past, a long-term strategy with a vision framework has to be put in place to provide time to make adjustments.

¹ C.H. de Tissera. 1999, *Urbanisation and water*. Paper presented at the National Workshop to Formulate a Sri Lanka Water Vision, Colombo, 6-8 May 1999.

Water Vision 2025

The vision we have set ourselves to achieve is:

A society that values the sustainable use of its water to achieve the goal of an environment conducive to balanced social and economic development

The above statement of vision covers the following important components:

VISION COMPONENTS

- An enabling environment with policy, legislation and institutional framework for Integrated Water Resources Management (IWRS)
- Optimum utilization of water resources for a dynamic and diversified economic system and for food security through efficient and sustainable use, both in terms of quantity and quality
- Well-maintained watersheds and clean water bodies, rivers, lakes, and ponds
- Access to adequate, and affordable safe drinking water for all
- Access to adequate sanitation and sewerage facilities to promote personal and environmental health
- Communities aware and conscious of their rights and responsibilities with regard to conservation and the supply, use, and value of water
- Efficient and effective institutions with adequate gender representation for implementing transparent, resilient, and participatory management practices
- Equitably shared water resources to minimize the impacts of spatial and temporal variations

This Water Vision 2025 must fit into the larger vision for Sri Lanka in 2025. Water is only a part of that larger vision, both as a factor in achieving the vision and also as its product.

Given the favorable human development indices and the trends in urbanization and industrial development, the Sri Lanka Water Vision and the Framework for Action have to respond to the needs of an emerging knowledge-based society, which will demand improved health, sanitation and water quality, and a cleaner environment.

Vision Drivers

- There are several factors, described as *drivers*, that can drive us towards the vision or away from it depending on how we adapt to them or influence them. Over 50 drivers, classified as *demographic, social, economic, technological, environmental and governance* are listed in table 1.
- As most of these are within our control, we can work towards a *sustainable water* scenario through policies and instruments conducive to achieving our vision, implemented effectively by appropriate institutions.
- Failure to achieve a *sustainable water* scenario would lead us to a *water crisis* probably by 2025 or sometime thereafter.
- **If these drivers perform in ways that are detrimental to achieving our vision, a *water crisis* will surely occur by 2025 if not much earlier.**

Table 1: Water vision drivers.

DEMOGRAPHIC	SOCIAL	ECONOMIC
<ul style="list-style-type: none"> ➤ Population growth ➤ Population 2025 ➤ Population density ➤ Regional distribution ➤ Urbanization ➤ Demographic composition — age structure ➤ Proportion employed in industry, commerce and services ➤ Rural to urban migration 	<ul style="list-style-type: none"> ➤ Peace and stability ➤ Quality of life ➤ Life style ➤ Income distribution ➤ Poverty alleviation ➤ Perception of value of water (whether “free” or “economic” good) ➤ Cultural values ➤ Community participation in decision-making ➤ Sensitivity to gender issues ➤ Social development, Indices ➤ Social deprivation, Indices ➤ Gender sensitivity 	<ul style="list-style-type: none"> ➤ Land use ➤ Land use efficiency ➤ Total volume and value of agricultural production ➤ Structure of agricultural production ➤ Water infrastructure – investment, management, maintenance ➤ Finance and trade ➤ Agricultural-Industrial balance ➤ Types of industries and services ➤ Location of industries with respect to water requirements and availability ➤ Economic growth rates ➤ Per capita income and income distribution
TECHNOLOGICAL	ENVIRONMENTAL	GOVERNANCE
<ul style="list-style-type: none"> ➤ Information and communication technologies ➤ Biotechnology, new plant varieties for enhanced production ➤ Water use efficiency ➤ Water treatment and re-use ➤ Energy use, costs ➤ Desalination ➤ Water pollution control ➤ Clean technology ➤ Rainwater harvesting 	<ul style="list-style-type: none"> ➤ Climatic change ➤ Salinization ➤ Depletion (quality and quantity) of surface water and groundwater ➤ Runoff, river flows, floods and drainage ➤ Integrity and health of aquatic resources ➤ Maintaining forest cover and biodiversity ➤ Agrochemical use ➤ Degradation of watersheds 	<ul style="list-style-type: none"> ➤ Market dominance in allocating and regulating land and water ➤ Land tenure ➤ Globalization ➤ Regional and provincial priorities and imperatives ➤ Institutional and legal frameworks

Population Growth and Urbanization

- A refreshing finding of the Sri Lanka Water Vision exercise is that by 2025 the population, unlike in the rest of South Asia, would stabilize at around 23 million. With the available water resources, the size of the population will not be a problem but its distribution and urban-rural composition could pose serious challenges.

The Problem

- Following current trends, the proportion of urban population will reach nearly 60 percent overall, but will be higher in the Western Province where more than half of the urban population of the country lives today.
- In absolute numbers, this will mean an increase of urban population from the present 5.6 million to 15 million. Nearly 10 million of the urban population in 2025 would crowd into urban centers in the Western Province. This will place a severe strain on the already overstretched water resources and the infrastructure for water supply and sanitation.
- The development of industries and services, which are also concentrated in this region, will further worsen this situation by adding to the demand for water supply and waste disposal.
- *Similar problems will be faced by other major urban centers also, which would have to absorb 3-4 million additional urban residents, and industries and services.*
- Water scarcity and water pollution can be major impediments to an orderly transition from a largely rural to an emerging urban society.
- Trade, tourism, aviation and shipping, and IT services are projected to expand rapidly in the next 25 years. Because of the social development that has already been reached, the emerging knowledge-based society will demand a higher quality of life with safe, potable water on tap, *good sanitation, a safe and clean environment and good health.*
- The problem, however, is not with urbanization as such, which is beneficial for the economy, but with the geographical pattern and nature of that urbanization; therefore, urban and industrial development must not take place without reference to sustainable use of water and must be planned taking into account the capacity of water resources in each river basin to sustain urban population, and industries and services associated with urbanization.

The challenge is to achieve an orderly transition from a largely rural society to a largely urban society, providing a satisfactory livelihood to all in a liveable environment.



Technological and management innovations are needed to improve urban water use.

Opportunities

- Formulation and implementation of comprehensive urban-regional plans with water availability factored in. The policy of giving priority to drinking water will be respected in reconciling the competition for water in scarce situations.
- Improved technology: Recycling of water and rainwater harvesting to meet much of the demand for industrial and non-consumptive uses in homes, hotels and commercial premises.

Water rates and other incentives would encourage proper use of good quality water.

- Duplicate water systems and even desalination are potential technological solutions that would become economically feasible for urban and industrial use by 2025.
- The major constraint in implementing some of these measures will be the investment required; without large investments they cannot be implemented. As the government is unable to mobilize such a volume of investment, it is necessary to attract private investment into this sector. The possibility of doing this depends on its profitability, which may require the installation of efficient systems of water supply to minimize water losses, good management, and charging for water at economic rates.

The potential for introducing technological and management innovations to provide more cost-effective water supplies to a larger population is quite high. The goal of safe drinking water and sanitation for all can be achieved by 2015.

Food Security and Agriculture

- **Food security must not be confused with self-sufficiency in food. It depends much more on the capacity of the national economy to obtain its requirement of food from domestic and foreign sources and on the ability of people to purchase the food available.**
- With the right agricultural policies in place, the emerging scenario will be a highly diversified and efficient agricultural economy, which will not only make optimal use of land and water resources but also ensure that profitable farming attracts enterprising and qualified persons to take up farming and provide an acceptable level of food security.
- The economy must make the best use of its resources, physical and human, and provide sufficient income-earning opportunities to the people. Maximizing the utility of water as an economic resource is, therefore, critical to achieving food security.
- We will see dramatic changes in agriculture in the next quarter century due to competition and globalization. While its importance in the national economy and composition of employment will decline relatively from the current 23 percent to around 12 percent with the growth of industries and services, it will be transformed into a highly productive commercial enterprise. This will be brought about by several factors:
 - The rural population is expected to decline from the current 13 million to about 9 million by 2025. This will reduce pressure on the natural resource base. Agriculture will be carried out by a smaller group of more educated and commercially oriented farmers who will produce “*more crop per drop*” using improved irrigation technology such as drip, sprinkler and lift irrigation limiting the need for the extension of agriculture.
 - Productivity in agriculture will increase with the introduction of paddy varieties and cultivation methods that require less water, adoption of water saving farming systems with high value crops, and other technological and biotechnological improvements.
 - Water will be treated as an economic resource rather than as a free good (as at present) and be priced realistically to optimize its use.
 - Globalization and the larger and richer domestic urban market with changing food habits will provide a profitable market for a variety of fresh and processed farm products.
 - Improved rural infrastructure, processing technology, cheaper storage and transport will improve access to domestic and foreign markets and increase the profitability of farming.
 - Value of small tanks and water bodies for social and environmental balance will be recognized and safeguarded.

Sri Lanka, through improvements in productivity per unit of land and water, or “more crop per drop,” has the potential to achieve the desired level of food security for its population without expanding the irrigated extent.

Sri Lanka recognizes, however, the need to sustain some of the less productive irrigated lands, especially under the village tank systems, to maintain a much-needed social and ecological balance.

Policies and strategies in the irrigated agriculture sector will be designed to achieve the above objectives.



“More crop per drop” – Drip Irrigation in Mahaweli System B, Informatics Agricultural Farm.

Water and Environment

- Water resources and environment are closely interrelated. Clearing of the forest cover in the upper watershed areas has created many environmental problems and affected biodiversity.
- Soil erosion is recognized as one of the major environment disasters in Sri Lanka’s hill country. The annual loss to the country on account of soil erosion and water pollution has been estimated at 2 percent of GDP.
- Increased surface runoff, frequent flooding, landslides, siltation of reservoirs and downstream riverbeds, reduced base flows and depletion of groundwater resources due to inadequate recharge are important environmental problems.
- Protection and maintenance of wetlands will be an important component of the National Environment Action Plan (NEAP).
- Increased awareness of this will lead to the reestablishment of commercially and/or biologically useful forest cover and other ecosystems.
- The decline of rural population and changes in the agricultural economy will make this possible by reducing the pressure of population on cultivated land and fragile ecosystems.
- Industrial and municipal effluents in urban areas and excessive use of agrochemicals in agriculture causing extensive water pollution needs regulation and monitoring.

Sri Lanka, with its time honored tradition of conservation of fauna and flora and being a biodiversity hot spot, has a commitment to have strategies for maintaining a healthy balance between economic development and environmental conservation in the Water Sector in the context of natural resources management.



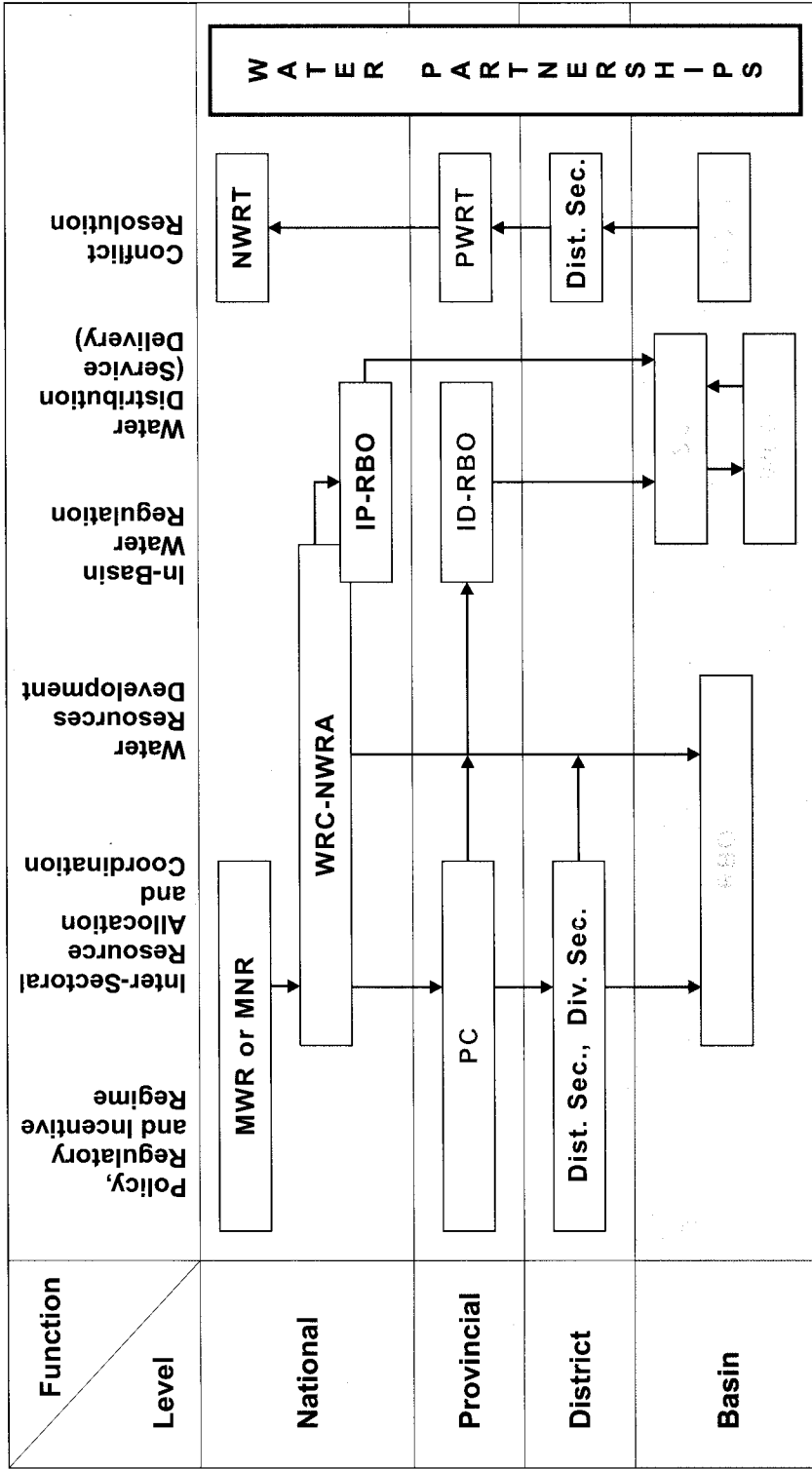
Village tank systems maintain a much needed social and ecological balance.

Governance

- **The current fragmented approach will give way to the holistic approach of Integrated Water Resources Management at the national, regional and river- basin levels to achieve the sustainable vision for water.**
- An institutional framework to allocate water more optimally among different users, after assessing the water resources more comprehensively and evaluating competing demands, will be established.
- The National Water Resources Authority, Water Resources Council and a Water Resources Tribunal will redefine the role of government by assuming the role of “regulator” and administrator of incentive regimes. The role of every public sector water agency will be reviewed and remodeled on the above lines.
- People’s organizations, local government authorities, and private and public sector agencies and civil society at large will build partnerships in the conservation and sharing of water in a sustainable manner at river-basin and sub-national levels.
- A more comprehensive and integrated legal framework will be in place to support the work of these institutions.
- *Valuation, costing, pricing and cost sharing backed by an incentive regime will promote conservation, investments and cost-effective management.*
- In line with overall trends in governance both globally and locally, the water sector will plan for the declining role of the public sector and promote more resilient and responsive partnerships at the local level.

The Framework for Action will redefine the role of government in Water Resources Management through a strong and transparent regulatory framework, incentives for effective management, and a pricing structure that will promote investments and sustainable management of water through broad-based partnership principles.

Conceptual Governance framework for IWRM



MWR = Ministry in charge of Water Resources
 ID-RBO = Inter-District River Basin Organization
 IP-RBO = Inter-Provincial River Basin Organization
 NWRT = National Water Resources Tribunal
 PC = Provincial Council
 NWRA = National Water Resources Authority
 WUO = Water Users Organization
 PWRT = Provincial Water Resources Tribunal
 MNR = Ministry in charge of Natural Resources
 SO = System Organization (irrigation, water supply, power, etc.)
 WRC = Water Resources Council
 BCRC = Basin-Level Conflict Resolution Committee

Capacity Building

- A new generation of water professionals who do not view water along short-term and narrow sectoral lines but recognize its intersectoral complementarity leading to a more coordinated use of water instead of the current fragmented competitiveness will emerge.
- There will be an increase in investment in capacity building for institutional strengthening at all levels and in Research and Development to support the numerous changes envisaged above, both nationally and internationally, and achieve the Sustainable Water Vision 2025.
- Exchange of information regionally and globally will be enhanced by the rapid development of electronic communication while the development of geographic information systems (GIS) will enable more accurate assessment of water resources and more effective allocation, management and monitoring of them.
- Educational programs using mass media will create greater public awareness of the critical importance of water and lead to a culture of conserving and using it in a sustainable manner.
- **It is eventually the society at large who must share the Water Vision 2025 and make it a reality.**

A society that values the sustainable use of its water to achieve the goal of an environment conducive to balanced social and economic development