



NATIONAL WATER POLICY

Federal Republic of Nigeria

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CHAPTER ONE

INTRODUCTION

1.0 Water Resources in Nigeria

Water is life. Adequate supply of water is central to life and civilization. Of the five basic human needs (water, food, health, education, peace) water is a common factor to the other four. Food production as well as most of societies' other socio-economic activities depends on availability of water. Furthermore, the efficiency of food production is currently measured on the basis of a unit increase in the volume of production per unit volume of water. Water has been a very important factor in settlement development in the country where it usually serves as human settlement boundaries.

Nigeria is considered to be abundantly blessed with water resources. However, there is temporal and spatial variation in water availability, the north with low precipitation of only about 500mm in the northeastern corner, and the south with precipitation of over 4,000mm in the southeast. This high variability of rainfall in time and space is a significant characteristic of the tropical climatic belt, especially the Sahelian part of the country, in which the country is located and this needs to be factored into water resources management in the country. The Nigerian Sahelian belt is at the southern border of the Sahara desert and it is here that the country faces the challenges of high variability in precipitation which has been manifested in the form of persistent drought in the past three decades with its attendant impact on reduction in the extent of wetlands in the Hadejia-Nguru area and the almost complete loss of the Lake Chad.

The country is drained mainly by the River Niger and its main tributary, the River Benue and their numerous minor tributaries as well as by the Lake Chad basin and the rivers that discharge into it. There are several other perennial rivers, e.g. Gongola, Hadejia-Jama'are, Kaduna, Cross River, Sokoto, Ogun, Osun, and Imo. Total surface runoff is large. Annual runoff at the Lokoja gauging station on River Niger has been recorded as up to 165.80 billion cubic meters. Volume of available groundwater is also considerable in large sedimentary basins (the Sokoto and the Chad basins) which lie along the country's international boundaries.

Nigeria, with a land area of about 924,000 sq.km, is located within the tropics where its climate is semi-arid in the North gradually becoming humid in the South. The annual rainfall varies from over 4,000mm in the South-East to below 250mm in the extreme North-East and is subject to significant temporal variation. The surface water resources potential of the country is estimated at 267.3 billion cubic metres while the groundwater potential is 51.9 billion cubic metres.¹

For the water resources assessment of the country, 163 automated hydrometric stations were established in 8 hydrological areas of the country while 26 existing primary stations were existing, primary stations upgraded to meet WMO (standards). The Ministry's National Hydrological Program has the objective of having 486 hydrological stations to constitute the basic primary network.

¹ Source: National Water Resources Master Plan (1995)

The total irrigation potential is about 3.14 million ha comprising of:

- 2.04 million ha for formal farmer owned and managed schemes based on conjunctive rise of surface/water and shallow fadama aquifers; and
- 1.1 million ha for formal public irrigation projects, which are under government control.

During the oil boom days of the 1970s and early 1980s, the country invested heavily in water resources development, particularly in the construction of multipurpose dams. The dams were meant to control flood, provide water for domestic and industrial uses, control riparian rights releases and for the environment, hydro-power generation, fishing, livestock, inland waterways and *irrigated agriculture* amongst others. We have constructed 200 dams storing up to 31 billion cubic metres. Out of these, 11 billion cubic metres are meant to command up to 340,000 hectares of irrigated land. So far, about 100,000 hectares of land have been equipped with the infrastructure whilst currently only about 60,000 hectares can actually be irrigated; thus the remaining 40,000 of the equipped field need some major rehabilitation. The balance of 240,000 hectares of land that can be commanded by the water stored so far, need to have the full complement of irrigation facilities in order for the country to derive the benefits fully.

A large percentage of the country's population which is estimated to be in the neighbourhood of 120 million does not have access to potable water. It is estimated, according to Multi-indicator Cluster Survey of 1999 by the Federal Office of Statistics, that only 52% of the urban (48% if peri-urban areas are included) and 39% of rural dwellers have access to potable water.

The Ministry has been collaborating with other sectors that are associated with water resources activities such as Federal Ministry of Agriculture, Environment, Power and Steel, Federal Department of Inland Waterways Authority and Nigerian Meteorological Services Agency.

The institutional arrangement for water resources development and management is such that all tiers of government, that is Federal, States and Local Government are involved.

To boost manpower supply for the water resources sector, the NWRI, Kaduna was established in 1979. It runs certificate, remedial and National Diploma and Higher National Diploma and professional post graduate courses in water resources.

Under the National Water Rehabilitation Training Programme, the Institute has trained a total number of 805 officers of State Water Agencies.

The Institute also runs a Data Bank with data from the eight (8) hydrological areas of the country. The Data Bank also has meteorological data from about 222 stations nationwide.

2.0 Operation and Maintenance

The operation and maintenance of water infrastructure has been very poor. The government has become increasingly concerned by this poor level of operation and maintenance, the National Council on Water Resources during its 16th Meeting in Asaba in 2002 set up a National Committee to recommend ways and policies initiatives to address the problem in order to make our water resources infrastructure sustainable.

There is need to insure all projects embarked upon by the Water Sector. For instance, huge sums expended into the construction of Dams and Reservoirs could easily be lost, if there is a natural disaster that causes severe damage to the Dams.

Also, the collateral damage that may result such as loss of life from flooding caused by breakdown of the spillway, etc., could result in serious legal suits against the Ministry. Insurance can go a long way to take care of these unforeseen contingencies.

Monitoring and Evaluation

Due mainly to inadequate funding, monitoring of the projects of the sector has not been carried out on regular basis.

Legal Framework

Presently, only the following Statutory laws: Decree 101, 1993; Minerals Act of 1990; NIWA Decree 13 of 1997; RBDA Act of 1990 and State Water Edicts are relevant in the development and management of the nation's water resources. Other Decrees associated with water resources are those of NEPA, FIWD, FME and the Land Use Decree.

Funding and Financing

The sector has been under funded because it is almost left to the Government and there is need for active private sector participation. However, the collaborations of the External Support Agencies have been encouraging and appreciated.

Challenges of Water Resources Development and Management in Nigeria

The country had made considerable investment in water schemes and related activities in addition to being blessed with abundant water resources the desire to improve access to this resource was becoming more and more elusive because of the rapidly increasing demand for water. This rise in demand that was outstripping supply is consequent on high population growth rate coupled with increasing urbanisation, and rising living condition as a result of economic growth. Other challenges facing Nigeria with respect to managing its water resources are shortages of water in urban and rural areas, competing water uses, lower level of irrigation potential, degrading watersheds and water courses, fragmented and uncoordinated water resources development, poor data and lack of cooperation on co-riparian use of international waters, all in a situation of rapid population growth and diminishing funds.

The nation's water sources are under serious threat from inadequate catchment management and widespread pollution, including the indiscriminate disposal of hazardous substances. There is limited groundwater availability in the areas of the country underlain by crystalline rocks. In the more productive sedimentary areas, groundwater exploitation is heavy and uncontrolled. In addition to above challenges, poor watershed management, deteriorating water quality, drought and desertification are inexorably increasing water scarcity. Scarcity threatens urban and rural developments with rapidly rising water supply costs, reduced reliability of water supplies, prolonged droughts, flood and erosion and increasing costs of irrigated food production. Water-related diseases are a major cause of morbidity and mortality, with malaria, diarrhoea, schistosomiasis, onchocerciasis and guinea worm all posing serious threats to public health.

The threats to the nation's water resources are symptoms of poor and uncoordinated management of the resource. Federal and state governments assume greater responsibility for overall management of the nation's water resources. In most cases, stakeholders are not consulted or otherwise involved in planning, development and management of the nation's water resources. The result has been a vicious cycle of unreliable projects that provide services that do not meet consumer needs and for which the consumers are unwilling to pay.

The absence of financial discipline and accountability for performance, along with political interference in decisions about allocations and pricing are reflected in a litany of problems: inefficient operations, inadequate maintenance, financial losses and unreliable service delivery. All these have resulted in highly subsidized water use in irrigation, industry and domestic water use for the rich. This is financially burdensome to both the federal and state governments that are

already faced with diminishing revenue base and must therefore have a higher proportion of their water resources financing derived from external sources.

Nigeria being located downstream of Rivers Niger and Benue, activities upstream of the river systems adversely affect water resources development and management of the country. Water is on the concurrent legislative list which poses a challenge to coordination and definition of roles

The National Water Resources Policy would provide a framework for addressing these challenges in order to achieve the following:

- Clear and coherent regulation.
- Clear definitions of the functions and relationship of sector institutions.
- Coordination Finds solution to the problem of dwindling funds.
- Reliable and adequate data for planning and projections.
- Decentralization in order to boost efficiency, performance and sustainability.
- Autonomy of water supply agencies.
- Regard water as an economic good.
- Create public awareness about water conservation and management.
- Provision of stable and adequate power supply.
- Accountability.
- Technical and financial capacity building to efficiently manage water delivery system.
- Human resource development.

Overview of the Policy Development Process

Consequent upon the enactment of Water Act 101 of 1993 and the preparation of the National Water Resources Master Plan in 1995, the Water Resources Management Reform Programme commenced in 1997. This programme carried out a Water Sector review in Legal and Regulatory Framework, Institutional Framework and Participatory Approach, Information and Water Resources Data base, Water Resources Economics and Financing, Environment and Resource Sustainability, Water Resources Infrastructure, Assets and Assets Management and International Waters.

The report of these reviews provided inputs in the formulation for a Water Resources policy, principles and strategies as presented in the draft policy.

Structure of the document

This document is divided into three sections. The first sets the Nigerian context and the process in which the Policy is being produced, and outlines the issues to which it is responding. It covers the social, political, economic and development context in Nigeria, as well as relevant international developments around water policy and management approaches.

The second section deals specifically with the new national Water Policy in Nigeria. It sets out the broad policy vision, addressing specific aspects of water management as well as indicating the institutional arrangements that will be necessary to implement the policy. Finally, the way forward for the development of new legislation and implementation of the new policy is outlined.

A definition of terms and a list of acronyms used in this Policy is provided at the end of the document to assist those who might not be familiar with some of the technical terms used in the water sector.

CHAPTER TWO

THE POLICY

Introduction

5.3.1 International trends and agreements in water Policy

The problems confronting Nigeria with regard to water management are not unique, although Nigeria is presently one of stressed in terms of water availability per person due to the unequal distribution of this vital resource. There are widespread speculations that the growing pressure on water resources will see water as a major cause of both national and international conflicts in the future and in many parts of the world.

As a result, not only is there a restless initiatives and a large amount of international thought, policy and practice which can be recast to meet the specific conditions of Nigeria.

The Millennium Development Goals (MDGs), NEPAD Objectives and the resolutions of various conferences, conventions and meetings listed below, guided the basis for the formulation of this water resources policy.

- the UN Conference on the Human Environment (Stockholm, 1972);
- Ramsar Convention, 1975.
- the International Drinking Water Supply and Sanitation Decade launch (Mar del Plata, 1977);
- Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Helsinki, 1992.
- the World Conference on Water and the Environment (Dublin, 1992);
- the United Nations Conference on the Environment and Development, UNCED Earth Summit - Agenda 21 (Rio de Janeiro, 1992);
- The International Convention to Combat Desertification, INCD, adopted 1994
- Development Assistance Committee meeting on Water Resource Management, OECD/DAC, 1994
- the Drinking Water and Environmental Sanitation Conference on the Implementation of Agenda 21 (Noordwijk, Meeting of Ministers, 1994);
- and the First World Water Forum of the World Water Council (Marrakesh, 1997).
- UN Convention on the Law of the Non-navigational Uses of International Watercourses, 1998. (UN Convention)

These meetings and conferences had a clear focus on meeting the needs for services of the portion of the population which suffers from insufficient access to water resources and water supply. They highlighted the fact that people had to be kept at the centre of the concern for sustainable development and that water management and development should be conducted on a

participatory basis with decision making occurring at the lowest appropriate level. Attention has increasingly turned to the need to protect and sustain the water resources to guarantee access to it for everyone and forever. Particular emphasis has been given to the sustainable management of water as a limited natural resource. This means that not everyone can have unlimited access to water resources. It has to be shared. There is also growing recognition that greater emphasis must be placed on the management of demand for water as an economic good to make sure that water use is as efficient as possible, both in terms of the quantities of water used and the impacts on water quality without compromising environmental requirements.

The Policy review process has reflected other international developments, such as the understanding that the support of policy development, institutional reform, and capacity building are as important as capital development projects, and that in order to increase the prospects for water and food security, special emphasis should be given to conflict prevention and resolution.

The other important international context is that of Nigeria and the neighbours with whom we share river basins and water resources. Nigeria takes into account international custom and practice (such as the Helsinki Rules) and is also assisting to develop regional co-operation through the international river basin organisations as such of the Niger Basin Authority (NBA) and the Lake Chad Basin Commission (LCBC).

5.3.2 Objectives

Previous and current government programs in the water sector have been centred on water resources development, while proper management and conservation of the resource was not given adequate attention. The previous approach to water resources development and management involved treating water as a public social good. It is centralized and entails top-down, command and control mechanisms.

There have been numerous activities in the area of water resources development in dam construction, urban water supply, irrigation and power generation. Each of these sub-sectors has developed water resources without adequate consultation with other stakeholders; has resulted in underutilization of the facilities provided.

In order to overcome this deficits the Nigerian Government embarks with this Water Policy on a new way on management and control of water resources in the vision of optimising the use of Nigerias water resources at all times, for present generations to live in harmony with environmental requirements, without compromising the existence of the future generations. In the light of this vision the new management of water resources represents the challenge of carefully balancing the water uses and water protection through a regulatory system of river basin based management and regulated allocations of water resources. The limits of self-regulation should be recognised. Water is too valuable a commodity for its management to be handed over solely to its users and there remains a vital role for government monitoring and enforcement.

However, the importance of eradicating poverty and therefore to enhance an improve public health through an optimal use of water resources for development remains the main driving force for the Government of Nigeria. The prevention of periodically occurrence of water crisis shall be addressed though this policy.

The first is the importance of achieving the right balance between stakeholder based management and enforcement by, for example, developing subsidy and incentive systems rather than focusing on penalties such as legal action for permit contraventions and the denial of permits. The institutional arrangements as stated in chapters 2.4.5 and 2.4.6 of this policy reflect this balancing intentions.

The following principles underpin the intention of protecting the nations water resources for a balanced social and economic development of the nation on a sustainable basis.

5.3.3 Principles

The guiding principles of the National Water Resources Policy are :

- The water policy shall be subject to and consistent with the Constitution in all matters including the determination of the public interest and the rights and obligations of all parties, public and private, with regards to water.
- All water, wherever it occurs in the water cycle, is a national asset and resource common to all, the use of which shall be subject to national control. All water shall have a consistent status in law, irrespective of where it occurs.
- The objective of managing the quantity, quality and reliability of the nation's water resources is to achieve optimum, long term, environmentally sustainable social and economic benefit for society from their use.
- There shall be no ownership of water but only a right (for environmental and basic human needs) or an authorisation for its use. Any authorisation to use water in terms of the water law shall not be in perpetuity.
- The planning and management of Nigeria's water resources shall take place within a framework which facilitates awareness and participation among all users at all levels.
- Water resources shall be assessed, developed, apportioned and managed in such a manner as to enable all users to have equitable access taking into account the sustainability of the resource
- Water quality and quantity are interdependent and shall be managed in an integrated manner, which is consistent with broader environmental management approaches.
- Water quality management options shall include the use of economic incentives and penalties to reduce pollution; and the possibility of irretrievable environmental degradation as a result of pollution shall be prevented.
- The management of water resources shall seek to harmonize human and environmental requirements, so that the human use of water does not individually or cumulatively compromise the long term sustainability of aquatic and associated ecosystems
- The operational management of water resources and services shall be decentralized to the lowest practicable level in accordance with the established 8 hydrological areas (HA) as the basic units of water resources management in Nigeria.
- International water resources, specifically shared river systems, shall be managed in a manner that optimises the benefits for all parties in a spirit of mutual co-operation. Allocations agreed for downstream countries shall be respected.
- Water quality management options shall include the use of economic incentives and penalties to reduce pollution.
- so that beneficiaries of the water services shall contribute to the cost of its establishment and maintenance on an equitable basis.
- The resource base shall be protected against any kind of pollution. The protection measures shall be based on both regulatory and market-based approaches to waste

management, applying the “polluter pays” principle.

- For the purpose of improving water related environmental conditions, abstraction fees for raw water shall be charged for the commercial use of it.

Water resources Management

5.3.4 Water Resources Assessment

Water resource assessment, of both surface water and groundwater, quantitatively and qualitatively, is a very fundamental element of the water resources planning process. Generally, effective planning cannot proceed without a thorough assessment of the water resources available. The assessment refers to all sector-wide basin and national level comprehensive collection and assembly of information on the quantity, quality, character, location and patterns of use, and response of the resource to use and user demands, pollution and water quality degradation processes. This assessment also includes water utilisation and activities for mitigating water related disasters such as floods and droughts.

Objectives

In order to have an appropriate basis for sustainable planning and development of water resources the following objectives for the assessment of water resources are to be achieved:

- To determine all available water resources including boundary conditions of both surface and underground waters, quantitatively and qualitatively for equitable distribution, abstraction, return/recharge, and apportionment, effective flood damage reduction and drought prevention.
- To improve real-time forecasting of hydrological phenomena that will aid contingency plans for the reduction of the adverse effects of drought and flood.

Strategies

In order to ensure that the above mentioned objectives can be achieved the following strategies will be followed:

- Establish of adequate number of primary hydrological and hydrogeological monitoring networks guaranteeing their proper operation and maintenance.
- Apply praxis proved Technology as tools for the generation, collection, organisation, storage, retrieval and dissemination of information.
- The management of hydrological risks and vulnerabilities shall be hinged on an effective water resources assessment program.
- Acquisition, collation, management and dissemination of all hydrological, hydrogeological, hydrometeorological and isotopic information with respect to National waters within Nigeria and International waters between Nigeria and her neighbours by installation of adequate number of monitoring networks;
- Define regularly the status of surface and groundwater resources in terms of quantity and quality and its use on the basis of river basin and in conjunction with aquifer boundaries; and the information made easily accessible to users, stakeholders and decision makers.
- Collect, collat, process, store and disseminate through publication of all data generated by

an authorized federal institution for this purpose .

- Produce hydrological/hydrogeological information on maps of various scales in accordance with UNESCO standard for the production of such maps, continuous review and update of the maps from time to time.
- Co-ordinate and encourage inter-agency flow of hydrometeorological information as well as rendering technical support to other agencies involved in the nation's water resources assessment and development.

5.3.5 Data and Information Management

The collection and analysis of data and the circulation of information is needed for different kinds of assessment, preparation of plans, construction and operation of projects. In addition, data are required for decision making and for taking appropriate interventional measures regarding management, allocation and development of water resources. An effective integrated water resource management system must be able to provide timely and correct information on the quantity, quality and resource use. Data analysis shall provide information to measure impacts on water utilisation against the environmental objectives.

Objectives

A sound Data and Information system on water resources data shall therefore be a public information tool which underpins the following objectives:

- To have correct and timely data and information for design, construction and operation of different projects with regard to their environmental impacts.
- To provide the nation with sets of coordinated, comprehensive, timely and reliable data and information in the water resources sector;

Strategy

In order to ensure that the above mentioned objectives and to obtain correct and timely data and information the following will undertaken:

- Strengthen the existing system of data collection, processing, storage and dissemination of various water resources information at National and Basin levels. This will be done on the basis of simplified, practical needs and cost effective and practicable solutions.
- Strengthen an effective system of local and international exchange of information, with a view to increase knowledge and experience, efficiency, and collaboration.
- Promote local manufacture of hydrological equipment such as manual gauges, depth sounders, etc., while instrumentation at our hydrological stations shall be standardized.
- Develop appropriate, feasible and financially viable data collection systems among others based on the involvement of users on catchment basin level.

5.3.6 Manpower Development and Capacity Building

Water resource management will only be successful if the personnel are developed not only on federal institutional level but in all relevant organisations and agencies, at all levels. Thus for integrated water resources management to be successful and to implement sustainable and participatory water management strategies, capacity will have to be built in user groups as well as

at a technical level. The Government shall ensure that entities are appropriately and properly staffed and that the staffs are adequately equipped and motivated. Women are an important group, particularly in rural areas, who should be a privileged group targeted by capacity building programmes. Women should be well represented in professional and managerial positions. Sustainable water supply and sewerage services delivery in urban areas requires building of strong institutions in terms of physical and human resources.

Objective

Manpower development and capacity building should aim at achieving the following objective:

- To have adequate competence and skilled manpower towards meeting the National requirements in the water management sector on all levels

Strategies

The following strategies are pursued by the government in order to achieve the objective:

- Build up comprehensive personal information systems on institutional level in order to assess the available technical and managerial capacities and to plan and implement training programs on a periodic basis
- Develop succession plans for the sector staff in accordance with the manpower requirements as established in national plans.
- Empower communities with skills and knowledge required for management of water resources schemes.
- Develop infrastructural training facilities for on the job training
- Strengthen the NWRI to provide coordination for manpower development in the lower and middle level areas
- Establish training network centres in various states of the country under the coordination of NWRI

5.3.7 Transboundary Waters

Nigeria is riparian to trans-boundary water bodies with neighbouring countries. Large abstractions and use of trans-boundary water resources requires understanding and agreement among the riparian states. Each of the trans-boundary water bodies exhibits unique characteristics, and a complex range of water management challenges. The most important consideration in Nigerias relations with those of its neighbours with which it shares rivers is that there must be respect for each country's equitable right to water from the shared resource as stated in the general principles. Because water does not recognise political boundaries, whether national or international, its management will be carried out in catchment areas although care must be taken that the policy of subsidiarity does not interfere with the need for a national and international perspective on water use.

The framework for the management of international shared water resources remains the Helsinki Rules. These state that each country which shares any river (basin state) has the right to a reasonable and equitable share of the water in the basin, and that the greatest benefit should be achieved with the least disadvantage to other country. The Nigerian Government will ensure that shared water resources among riparian countries shall be used to strengthen socio-economic and political relations respecting international conventions and treaties that are in force

Objectives

In order to enhance the shared use of water from transboundary water resources to the best benefit of all countries concerned, the following objectives are to be achieved:

- To have rational and optimal use of the shared water resources for the development of Nigeria in order to improve the living conditions among the people of the shared basin;
- To strengthen co-operation among riparian states in their efforts to find solutions to development problems, thereby promoting cordial relationships among the people of the border regions to live as good neighbours.

Strategies

In order to ensure an effective framework for the management, development and utilization of trans-boundary water resources the following measures will be undertaken:

- Nigeria will seek to cooperate with other riparian countries for the development, optimum use and protection of transboundary waters wherever possible and in her national interest without compromising her sovereignty.
- Establish an effective dispute resolution mechanism in consultation with core-riparian within the regional commission and authority.
- Review all international treaties and agreements on a shared basis to reflect the key issues raised in the United Nations (UN) Convention.
- Establish a comprehensive monitoring system for water resources in collaboration with co-riparian in all its boundary basins for essential data collection with a uniform format to be collated, analyzed and shared.
- Support the regional agencies' activities, meet its own commitment and exert influence to ensure protection of her interest as a vulnerable downstream riparian state.

5.3.8 Institutional Arrangement

The institutional arrangement will be adopted to respond to Nigeria's vision of equal distribution of the water resources between users without compromising the environmental requirements and those of future generations. The new institutions we build will have to meet natural, technical and social considerations, respecting existing rules and regulations and able to adopt a flexible approach to water management.

One of Nigeria's new government approaches is that of co-operative governance. This recognises that, while many governmental functions are undertaken on national, state or local levels, there must be a commitment to co-operation between each level and with the population. This profoundly affects water resource management.

Water management is a complex function which includes regulatory, support and operational activities. Any review of water management institutions must look at whether there are any services that could more cost effectively and more efficiently be undertaken outside of the Public Service through both beneficiary management or through Public Sector Participation.

The role of Government

The political past has left a great lack of management capacity in many areas across the different levels of government. Thus, to help build the ability of all levels of government to provide water

services and to contribute to water resource management, national Government must be the driving force in this vision.

In addition responsibilities of data collection and dissemination, monitoring and evaluation, establishment and maintenance of water resources databases and information management systems, preparation and implementation of training programs, and preparation of Regulations will as well remain at federal level. However, these functions will be delegated to state and local administrative levels, where feasible. The Minister is the appellate authority. The structure and functions of present Water resource council will be reviewed and assigned new roles of integrated, multi-sectoral water resources planning and management, in addition to resolution of national level conflicts among sectors. In addition, the Ministry responsible for Water will be the custodian and implementer of the water law.

The Federal Government represented by the Ministry of water resources and its agencies shall be responsible for policy formulation, macro planning regulation, setting standards, monitoring and evaluation, coordination and collaboration with national and international organizations.

State Governments represented by the ministries responsible for water resources and their agencies shall be responsible at a lower level for policy formulation, macro planning regulation, setting standards, monitoring and evaluation, coordination and collaboration with national and international organizations within their catchment areas and administrative procedures of defining water protection zones and the issuing of water permits.

Management at basin and catchment level

In parallel to this regulatory and law enforcement set-up, water resource management will be done in an integrated and demand-driven manner with strong involvement of beneficiaries in resource protection and conservation, monitoring, planning, development and operation. The complexity of an integrated approach to water management reinforces the need to assess competing water-uses on the basis of optimum-to-all rather than simply beneficial use. It has been concluded that the most appropriate unit in which this can be done are the 8 hydrological areas or its sub-catchments. Whatever arrangement is introduced, it must be clear that it will remain subject to national authority.

River basin organisations will be created in accordance with the 8 hydrological areas of Nigeria in order to carry out the aforementioned functions. Community based organisations as Water user associations or others will be involved in the activities of these river basin organisations with multi-level stakeholder committees. The involvement shall address both, water allocation issues based on water demand and improve the understanding of the complex water management in order to achieve a sustainable use for the available water resources as spelled out in the general principles of this policy.

Objective

The objective to achieve with this two-column set-up is:

- To have in place an effective institutional framework with clearly defined roles on the different administrative levels for integrated, sustainable and participatory management and regulation of water resources

Strategies

The following measures will be necessary to achieve this objective:

- Propose a conducive administrative set-up for the different levels of government

- Review the existing water decree 101 in the light of the current Water policy with regard to institutional arrangements.
- Establish River basin Organisations to act as government authorities within the boundaries of the existing hydrological areas with the goal of coordinating competing interests over water use between stakeholders and to collect abstraction fees
- Establish a regular forum of all stakeholder agencies in all water resources matters in order to harmonize the activities and remove areas of conflict and duplication

5.3.9 Legal Regulatory Framework

The Water Decree 101 from 1993 is the principle legislation governing the utilization and pollution control of the water resources. This legislation do not adequately meet present and emerging water resources management challenges and the requirement emerging from this water policy. Thus the legislation needs to be reviewed in order to address the growing water management challenges.

A central issue of a new water legislation will be the definition of access to water resources through permits, the establishment of water protection zones and the fees related to water raw water abstraction and fines for water misuse and pollution. This is to respect the “user–pays” principle. Access and the application of royalties for water abstraction will not be applied in a general manner but limited to the commercial use of water resources only.

Objectives

In order to define the goal of an effective regulatory framework the following objective is defined:

- To effectively carry out Government ownership and control over the equitable and sustainable use of the entire national water resources as stipulated in Act 101 of 1993 on the one hand and participatory aspects of water management on the other hand

Strategies

In order to have an effective legal and regulatory framework the following will be done:

- Review the existing legislation for the control and management of water resources in an integrated manner for its conservation, equitable distribution and allocation within stringent rules and controls.
- Introduce stringent controls in the areas of subsidiary legislation for water quantity and quality particularly in pollution control mechanisms, quality standards for potable water, discharge of effluence and wastewater by industries and responsibility to take precautionary actions in the course of discharge.
- Since the current legislation (Act 101 of 1993) is devoid of effective rules and regulations, the inadequacies need to be addressed . To this effect, there should be subsidiary legislation to the main legislation,
 - to provide for procedures for water quality management;
 - to regulate in the areas of groundwater abstraction through the use of boreholes, wells, etc., in order to manage ground water effectively,
 - to protect groundwater resources from over-exploitation, depletion and pollution through the establishment of water protection zones and

- to establish a list of fees for abstraction of ground and surface water in accordance with the use given the water abstracted and to clearly specify the utilization of accumulated funds, which shall be earmarked for water environmental protection purposes only.
- In respect of complaints arising on all water issues with regard to distribution, uses, and tariffs there shall be established a regulatory body for Appeals and dispute resolution which would operate according to laid down rules and regulations.
- Relevant customary law and practice related to water management will be institutionalised into statutes.

5.3.10 Research and Development

Currently a variety of technologies are used in the sector. Some of these technologies are not sustainable because they are costly and inappropriate for the local situation. Research shall strengthen local capacities and help finding cost effective and feasible solutions, intended to promote best practices for technical and environmental requirements.

Objectives

Applied research and technological development shall be promoted in this regard to achieve the following objective:

- To have sufficient knowledge on water related issues as to facilitate conducive decisions in water management for both water regulation and water use

Strategies

The following strategies shall be followed on order to achieve this objective:

- To encourage establishment of sectoral research section at the Federal and State levels
- Develop mechanisms for coordinating and dissemination of sector research and institutionalize these guaranteeing the participation of all sector stakeholders.
- Encourage local researchers initiatives.

Crosscutting issues for Water use as a basis for economic development

Water uses are an important basis of economic development of Nigeria and therefore been given special attention. As stated in the general principles these uses underlie environmental and sustainability requirements and have therefore be developed in a harmonized and careful manner. Chapter 2.3 refers to principle considerations which shall apply to all water uses further developed in chapter 2.4.

5.3.11 Economics and Financing of Water Services

Water services are vital for the well-being of the population and the economic development of Nigeria. These water services can be delivered through public, private or community based institutions. Water pricing for theses services is a substantial aspect underpinning the understanding of water as an economic good. Meanwhile raw water abstraction fees consider environmental and resource costs of water use, charges for water services refer to investments and operational costs necessary to guarantee this service. Cost recovery of these services is necessary to ensure their long-term utilisation. This does not mean, that all beneficiaries of water services pay the full cost of investments neither that all users pay the same price for it. A careful

application of cross-subsidies among users and cost-sharing between users and government shall be applied to protect the poor. It is, however, of imperative importance to know the total costs of each service in order to allow the application of these tools and to find out the most cost-effective investments.

Objectives

The objective to achieve reads as follows:

- To ensure that water services are paid for in the sake of a sustainable use of investments made

Strategies

The following strategies shall help to achieve the objective respecting the principles stated above:

- Grant some level autonomy to government water agencies to ensure high level of efficiency and cost recovery.
- Encourage financial institutions to provide Loans to the water service sector.

5.3.12 Private Sector Participation

Water development and delivery has in the past been dominated by the public sector. The private sector is at infancy and its involvement has been limited and hence its growth slow. Involvement of the private sector in the delivery of water services will improve efficiency and effectiveness and enhance development and sustainability of service delivery. The new strategy, in conformity with the ongoing reforms in the public sector, is for the Government to change its role from being an implementer to a regulator, facilitator and co-coordinator. In order to avoid the misuse of monopolies and therefore protect the users, a regulatory body will be created, which allow for the monitoring and setting of standards for water service tariffs. This body shall have an independent status to be able to mediate between the government and their private contract partners in the vision of protecting the beneficiaries of the service delivered. In drawing up contracts between government and private partners special emphasis shall be laid on improving the service delivery to the poor, avoiding a “raisin-picking” of the private.

The creation a an enabling environment for private sector participation is imperative. This means ensuring a regulatory framework which allows the private sector initiatives to evolve without being object to illegal practices such as corruption. Such practices contradict the requirement of sound service delivery to the beneficiaries and impede to draw the most benefits from private sector initiative and shall therefore be combated.

Objectives:

The following objective is to be achieved through Private sector Participation:

- To achieve a better and more efficient service delivery to all users through enhanced private sector participation in water services

Strategies

In order to promote Private Sector Participation in all areas of water services the following will be undertaken:

- To create regulations assuring conducive conditions, including incentives and legal recognition, of operation for local and foreign private companies in water services

- Establish a regulatory framework for the activities of water services providers to guarantee adequate protection of consumers.
- To encourage various forms of participation through instruments such as BOOT Lease Contract, Financial Management Contracts etc.
- Assist all level of government to cope with the requirement of managing contracts with the private sector.
- Promote the importance of the private sector participation in the provision of rural water supply and sanitation services on community level
- Set up an independent body for mediation and regulation purposes of contracts entered into between government and the private sector

5.3.13 Monitoring and Evaluation of water projects

Improvement of water service delivery requires that activities are continuously monitored and evaluated to guarantee a timely execution of projects and to ensure their sustainability. This is to improve on the envisaged impact of any project. Where feasible participatory monitoring and evaluation will be carried out (mainly at community levels) with support from the government levels, ESAs, NGOs, and the Private Sector.

Objectives

The following objectives describe the expected achievements of a proper monitoring and evaluation system:

- To measure output of water resources delivery against the investment and measure the impact of the programmes and projects on the life of the beneficiaries and the environment.
- To improve transparency and accountability in the sector.
- To assist in determining the continuity of similar project elsewhere.

Strategies

- Require sound monitoring systems for all projects allowing for monitoring and evaluation on a regular basis.
- Design guidelines for monitoring and data collection to guide and promote relevant monitoring and data generation activities;
- Organise workshops, seminars and conferences on performance monitoring and evaluation and disseminate relevant outcomes to all stakeholders;
- Develop a comprehensive data bank on water resources projects to facilitate data handling, exchange and utilization for policy formulation and forward planning;
- Promote public awareness and inculcate positive attitude towards efficient handling of project facilities to users ;

5.3.14 Operation and Maintenance

As far as it is applicable operation and maintenance of water delivery schemes shall be done on a lowest appropriate level using the services of the private sector. This is to ensure a long-term utilization of water services.

Objective

The Objective for proper operation and maintenance is as follows:

- To ensure that all water infrastructures are properly operated, adequately maintained and rehabilitated as and when necessary in order to ensure their sustainability and safety.

Strategies

The following strategies will ensure the achievement of the objective stated above:

- Establish transparent systems of adequate data management throughout the lifetime of all infrastructures
- Ensure the application of standard construction procedures
- Establish clear regulation of stakeholder participation in operation and maintenance of community based infrastructure
- Ease village level repair and maintenance through the promotion of Village Level Operation and Maintenance Systems (e.g. VLOM handpumps)
- Promote decentralised repair and spare parts delivery for rural and small town water supply systems
- Ensure production of operation and maintenance manual by the contractors after the completion of projects
- Ensure that contract agreements shall contain provisions for twelve months defective maintenance period.

5.3.15 Compliance with environmental requirements

In order to respect environmental requirements as laid down in the general principles, all water infrastructures shall be subject to regulations with this regard.

Objectives

The regulatory framework to be established will guarantee the achievement of the following objectives:

- To conserve and protect the environment from degradation, pollution and overexploitation.
- To prevent uncontrolled exploitation of water as a natural resource.
- To ensure sustainable access to water through good environmental management practices

Strategies

The following strategies will be pursued in order to achieve compliance with environmental regulations:

- Establish regulations compelling to carry out Environmental Impact Assessment (EIA) and Environmental Audit (EA) on all water resources programmes and projects and to impose sanctions be imposed to control environmental degradation.
- Ensure implementation of resettlement and compensation programmes and projects

during main project execution.

- Carry out Environmental Impact Assessment (EIA) and Environmental Audit (EA) for mitigation measure.
- Assist in resettlement and determination of compensation.

Sectoral policies

All sectors dealt with in this chapter may be subject of individual policies. The policy outlines stated here are oriented towards the environmental aspects of these sectors.

5.3.16 Water Supply and Sanitation

The National Water Supply and Sanitation Policy (2000) emphasizes – in accordance with the Millennium Development Goals - the provision of sufficient potable water and adequate sanitation to all Nigerians in an affordable and sustainable way through a cost sharing formula on investment and operational costs between government and the beneficiary. A careful balance between affordable tariffs for the poor and a high degree of cost recovery is a real challenge for the implementation of the policy with this regard.

Water demand in urban and small town areas is increasing at a rate, which is not proportional to the rate of expansion of water supply and sewerage services. This is due to the increase in urban population, increase of industrial activities and significant unaccounted-for-water that includes leakage, wastage and illegal connections. Water demand management measures will replace the up to now existing supply management in order to conserve and use the available water efficiently and equitably and to protect the poor.

Objective

The main objective in water supply and sanitation is:

- To increase service coverage for water supply and sanitation nationwide to meet the level of socio-economic demand of the nation in the sector through :
 - new projects designed carefully to meet the real demand of the population avoiding over sizing
 - combating leakages and losses
 - reducing unaccounted for water

Strategies

The following strategies are pursued in order to respect the principles and to achieve the Objectives stated above:

- Establish a data management system on water supply and sanitation, including information on expansion of schemes and extension of distribution networks, rehabilitation and modernization of existing schemes
- Prevent wasteful water use and control water leakages through special awareness campaigns and standards set for the water supply service providers.
- Promote universal metering of water consumption in existing projects and enforce it in new projects of urban and small town supply systems.
- Carry out programs to combat illegal connections

- Carry out programmes to reduce “commercial losses” on private, industrial and administrative consumption
- Promote social marketing of water saving devices.
- Establish a national water quality reference laboratory.
- Encourage private and community ownership of water supply and sanitation facilities.
- Encourage local manufacture of water supply and sanitation equipment and treatment chemicals.
- Strengthen water supply and sanitation training institutions.
- Grant operational autonomy to water supply and sanitation agencies.
- Adopt a cost sharing formulae, for capital investment operation and maintenance, rehabilitation and reinvestment as proposed in the National Water Supply and Sanitation Policy (2000) for the three tiers of government and the community.
- Enhance national capacity in the operation and management of water supply and sanitation undertaking.
- Ensure good quality standards (including WHO standards for water quality) are maintained by water supply undertakings.
- Monitor the performance of the sector for sound policy adjustment and development for water supply and sanitation.

5.3.17 Dams and Reservoirs

Dams are important structures for storing water, thus regulating flows and containing floods. Hereby they are an important economic factor through the provision of water for economic activities and for avoiding the destruction of economic means, life and property through floods. However, establishment of dams and reservoirs in a watercourse automatically introduces the element of risk in possible loss of life and property to the people living downstream due to possibility of dam failure. The inherent much bigger danger emerging from big dam constructions and the lower degree of technique allowing users to more easily participate in dam operation and maintenance favour the construction of small dams.

Objectives

The following objectives are envisaged:

- To ensure the availability of surface water for its different socio-economic uses through design, construction and operation of financially viable storage devices without compromising environmental requirements
- To ensure proper harnessing and utilization of the vast water resources of the nation.

Strategies

In order to optimise the benefits of dams the following strategies will be followed:

- Ensure Proper operation and management of Dams and Reservoirs in accordance with the operational manual and engineering standards.
- Ensure the Construction of Small and Medium Dams in accordance with the guidelines provided in the National Water Resources Master Plan.

- Investigate on possibilities of interbasin Water Transfer from areas of surplus to areas of need.
- To Improve existing reservoirs, formulate a reservoir operation policy for the existing dams in line with the National Water Resources Master Plan
- Dam owners and potential developers will be required to prepare dam safety monitoring plans and implement them in accordance with the established procedures. Water Legislation shall provide for dam safety.
- Emphasize the building of small and medium dams in locations where feasible, with its low capital costs, easy to maintain and cheaper to manage compared to large dams.
- Continuously monitor and inspect the dams in accordance with the laid down rules and regulations.
- Ensure provisions for downstream releases for the environment and other uses.

5.3.18 Irrigation and Drainage

Water can be made to contribute to the national economy through the development of the country's water resources and expanding irrigation schemes so that agricultural production is improved by reducing the problem of water shortage caused by the unpredictability of the rainfall. Many actual irrigation schemes do not operate effectively. By and large operation fees are not sufficiently collected and therefore maintenance and repair cost cannot be met leading to the degradation of existing schemes. The population, especially the poor can therefore not profit sufficiently from the existing schemes. Reducing poverty through the delivery of efficiently operating irrigation schemes is a main target of the Nigerian government. This is what this policy intends to outline meanwhile a separate strategy for Irrigation is being developed.

Objectives

This translates into the following objectives:

- To reduce poverty through effective irrigation schemes allowing appropriate operation and management by the beneficiaries
- To optimise the use of water and the land resources to enhance production
- To slow, stop or reverse the rates of environmental degradation in the existing schemes;

Strategies

- Establish communication systems for the Adoption of best practice in irrigation development and management
- Encourage the use of indigenous tested and proven technology
- Adopt the catchment management planning approach to irrigation and drainage development in preference to project-by-project approach
- Ensure sustainable financial autonomy through cost recovery; with the ultimate aim of achieving financial autonomy for the managing agencies;
- Rehabilitate existing schemes, where applicable, would be fully supported by government prior to the introduction of financial autonomy;
- Establish rules and regulations to guarantee billing and collection of service charges by the irrigation agencies or through water users associations;

- Ensure integration of irrigated agriculture into the national agricultural production system through improved inter-sectoral linkage between Water Resources and Agriculture;
- Encourage the formation and strengthening of Water Users Associations with a view to achieving Participatory Irrigation Management (PIM);
- Encourage and support irrigation research and use of research findings.
- To create enabling environment for effective private sector participation;
- Proper and regular operation and maintenance of infrastructure
- Collaboration with external support agencies
- More emphasis shall be placed on drainage and reclamation schemes
- Increase the development of small scale/fadama irrigation projects

5.3.19 Other Uses

Hydropower Generation

As far back as 1995, a total aggregate of capacity installed of power plants under NEPA is 6,000 MW (1,900 of hydro and 4,100 of thermal). Out of the 6,000 MW capacity only about 4,000 MW has been made available due to some major breakdowns which occurred in the past in plant, machinery and equipment.

Quite often, hydropower plants of Kainji and Jebba on the Niger River suffer from the decrease of reservoir inflow due to effect of the Sahelian drought and anticipated use of the Niger water by upstream countries as well as invasion by water hyacinth.

The following strategies are pursued by the Nigerian government in order to improve hydropower generation:

- a) Encourage balancing, modernization and Rehabilitation works on all the existing hydro power plant .
- b) Pursue with vigor the present privatization and commercialization of some aspects of NEPA hydro power installation.
- c) Encourage the development of major hydro power plant on Built, Operate and Transfer (BOT) policy.
- d) Identify potential mini-hydro sites for isolated rural electrification involving State Rural Electrification Boards under coordination of NEPA, RBDAs, private sector and the energy Commission of Nigeria.
- e) Carry out studies on It is also expected that five multipurpose large scale dam projects are to be studied on the left side of Benue River within the next twenty years.

Inland Navigation

National Inland Waterways Authority (NIWA) which was established in 1956 to take charge of inland navigation had in the past provided the main communication routes and access from coast to the hinterland and has accounted for more than 30 percent of our transportation.

Since 1966, the flow patterns and conditions along the Rivers Niger and Benue have deteriorated with more eroded sediments from watershed and flow reduction by upstream withdrawal.

The following strategies are pursued by the Nigerian government in order to improve inland navigation:

- a) Redress the adverse situations on our large rivers, significant modifications by way of provision of capital and maintenance dredging must be pursued by National Inland Waterways Authority (NIWA).
- b) Pursue the privatization and commercialization policy in this sub-sector of the economy to improve the effectiveness and efficiency of inland Navigation.
- c) Harmonize the Water Resources Act 101 of 1993 with the 1988 Navigable Waterways law so that there is no overlapping of responsibilities of Federal Ministry of Water Resources with those of NIWA.
- d) Carry out studies on the Lower Niger River so as to provide barges for navigability of the Lower Niger Area.
- e) Undertake River channel management including hydrological and morphological observation and study to a limited extent for the dredging of local critical parts and bed - regulations by groynes, training walls and bank stabilization for difficult crossings and flats.
- f) Establish discharge regulations from Jebba and Shiroro dams, under the management of NEPA in cooperation with Federal Ministry of Water Resources.

Fisheries and Livestock

On fisheries development, the current level of per capita annual fish consumption is about 4 kg which is lower than Africa's average of 9 kg and the minimum requirement of 11.5 kilograms as recommended by FAO. There is an increasing contribution from import and the domestic production has proportionately decreased.

Nigeria is generally endowed with very large bodies of natural water in wetlands, rivers and lakes. Much has not been done towards harnessing the aquatic resources in our reservoirs.

The following strategies are pursued by the Nigerian government in order to improve the poverty reducing benefits of fisheries and livestock with regard to better water management:

- g) Provide fish ladders at dams in order to ensure the passage of fish. Carry out studies in the pre-impoundment of dams to protect the ecology of reservoirs.
- a) Ensure that enough water shall be released through our dams to satisfy the downstream requirements for livestock production.
- b) Ensure that water resources management respects the requirements of self sufficiency in fish production through an effective liaison with the Federal Ministry of Agriculture and Natural Resources.
- c) Ensure that newly planned dams guarantee the respect of the requirements of self sufficiency in fish production.

Recreation & Tourism

The pressure on water resources especially in dam construction increased considerably in the last several decades. Growth in world population, economic development, urbanization and improved standard of living have made imperative for increasing water based recreational facilities. Stored water in dams has aesthetic values for relaxation and recreation. Government should therefore encourage tourism. Facilities should be provided in all dam for recreational purposes and tourism,

which will generate employment opportunities and foreign exchange earning. Tourism encourages cross cultural development and therefore minimizes violence and ignorance. It uplifts peoples perception about other cultures thereby promoting unity, understanding and peace.

CHAPTER THREE

WAY FORWARD

3.1 *The national water law*

With the adoption of this Federal Water Policy for Nigeria, a new process of consultation will begin in support of the development of a new National Water Law and regulations for its implementation. Participation will include communities through water users, academic institutions, scientific councils, and Government at national, state, and local levels.

The National Water Law will take into account the different physical, social and economic circumstances that exist in different areas of the country. It will provide a flexible framework which enables appropriate arrangements to be introduced which recognise these differences while also taking into account the principle of equality before the law and other legislation or policy.

3.2 *Implementation of the new legislation*

To bring the new water law into effect will require a major programme of work. The management requirements to implement the new policy directions will be considered in a separate programme of action by the Federal Ministry of Water Resources.

The policy outlined in this document will require a new structure for the management of the nation's water resources. It will also have significant implications for the allocation of water and the recognition of particular rights and uses. Specific mechanisms will be required for a smooth transition from the present system to the new.

The economic and administrative implications of implementing new water legislation mean that certain elements will be most efficiently implemented through a phased process according to the social, economic and technical circumstances prevailing in each water region/catchment.

This fits in with the proposal that hydrological areas be identified as the institutional base for water resource management. The ongoing process of analysing the existing organisations in the sector of water management will go on and culminate in a set up respecting the policy outline made in this document.

In the interim period, the management of water resources will continue to be administered by the relevant institutions.

The new approach to water management outlined in this Policy is crucial for the long-term economic development of Nigeria. It considers water as an instrument of social justice, of economic development and of peace. It will ensure growth without compromising the requirements of the environment and future generations.

The policy outlined in this document, and the legislation that arises from it, is therefore vital for all Nigerians. It will provide the national Government with the tools required to fulfil its role as custodian of Nigeria's precious and limited water resources.

ACRONYMS

BOT	Build, Operate Transfer (contract)
DAC	Development Assistance Committee / OECD
EIA	Environmental Impact Assessment
FME	Federal Ministry of Environment
LCBC	Lake Chad Basin Commission
NBA	Niger Basin Authority
NCWR	National Council for Water Resources
NEPA	National Electric Power Authority
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
NIWA	National Inland Waterways Authority
NWRI	National Water Resources Institute
RBDA	River Basin Development Authority
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
VLOM	Village Level Operation and Maintenance
WHO	World Health Organization
WMO	World Meteorological Organisation
WSSD	World Summit in Sustainable development
WUA	Water Users Association
WWF	World Water Forum

Glossary

Abstraction /raw water fees	: Royalties for abstracting raw water which has not incurred any costs of storage, processing, treatment whatsoever
Commercial losses	: Ratio between unpaid to issued bills in water supply systems, in percentage
Cooperative government	: Nigerian Policy of integrating the public in decision making.
Cost recovery	: Degree of to which extent water services are paid for by the users to cover the expenditures met by a water service provider. They are split up in operation and maintenance-, repair-, investment- , capital and costs for levies and taxes which have all to be met for achieving full cost recovery.
Integrated water resource management	: Integrating the different users and uses of water resources
River basin	: A geographical areas described by the watershed limits.
Stakeholder	: Private or public Organisation or individual concerned or responsible for a common interest (here: water management)
Transboundary waters	: International rivers traversing adjacent countries or water bodies shared by riparian neighbouring countries
Unaccounted for water	: Ratio between produced water and water paid for in water supply systems, in percentage
Water resources development	: Physical activities necessary for the exploitation of raw water for usage purposes.
Water resources management	: Planning the allocation of water for its different uses.
Water services charges/fees	: Money paid by a water user for receiving water for covering the expenditures made for water provision by a service provider
Water protection zone	: A defined zone around groundwater abstraction devices limiting commercial or domestic activities in order to protect the aquifer from depletion and pollution
Water services	: Provision of water for any usage purposes which entails investments and /or manpower.
Watershed / basin Management	: Undertaking water resource management inside the hydrological boundaries and not according to often different administrative boundaries.