



UNITED NATION  
ECONOMIC COMMISSION FOR AFRICA

# Water Supply and Sanitation Policy for Sierra Leone



## **ACKNOWLEDGEMENTS**

This draft Policy was developed at the request of an Official Government of Sierra Leone Delegation to the United Nations Economic Commission for Africa (ECA) comprising then Ministers A. Jalloh of the Ministry of Energy and Water Resources and Dr. Rogers, Deputy Minister of Finance.

At the direction of the Executive Secretary of the ECA, a multi-disciplinary team was formed to provide the Technical Assistance support comprising:

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This Team was responsible overall for the executions of all the programme activities that has led to two draft Policy documents for Water and Sanitation and Energy. These activities were carried out with funding support from the Netherlands Ministry of Development Cooperation for the Inter Agency Group on Water in Africa (IGWA) Project.

For this Policy document on Water and Sanitation for Sierra Leone, I will like to acknowledge the untiring and effective work done by Mr. Nii Boi Ayibotele who provided substantive support as consultant on Water and Sanitation, and our counterpart team at SALWACO designated by Minister Grant of Energy and Power who took over from Minister Jalloh. Special thanks go to Mr. Justin Musa, Director of SALWACO, Mr. Joseph Mahayei, Deputy Director and all the inter-departmental staff who worked with us in conceptualizing and executing the assignment including the two major National Workshops we organized for Policy Development and later Policy Review.

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Stephen Maxwell Donkor  
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## **Preface**

Water is Life and the provision of water for the people of Sierra Leone is a necessary precondition for socio-economic recovery at all levels of Society. After a decade of war, which not only made the existing infrastructure obsolete but also led to the destruction of even the minimal infrastructure inherited on independence, Sierra Leone is back on track to reconstruction and rehabilitation.

As a fellow African, it was with great interest that I received the request from Minister's Chornor Jalloh and Edward Rogers to assist through the ECA Regional Advisory Services in the formulation and development of a National Policy for Water and Energy to guide their government in the reconstruction efforts in these sectors. This requested provided an opportunity to mobilize ECA's Divisions to work at the country level not only to assist in post conflict reconstruction and also to apply some of the Global and Policy Frameworks such as NEPAD and African Water Vision 2025 where it counts most.

Over the last year, an intensive process of consultation and review has been organized by the Government of Sierra Leone with the support of ECA that involved stakeholders from all levels of Sierra Leonian society. Sierra Leoneans from urban and rural, displaced persons and others met in an open and participatory process to determine the challenges and policy responses needed in the medium – and long- term for recovery and development in the Water and Sanitation sectors.

With this brief note, I take the opportunity to thank all the men and women, local institutions (NGOs such as OXFAM, Civic groups, etc) and sister UN organizations such as UNICEF, World Bank as well as the European Union for their support and continuing interest in the Policy formulation process. I look forward to the legal review and transformation into legislation of this Policy document so that internal and external resources will swiftly be mobilized for its implementation. This will not only contribute to the restoration of the standard of living to pre-war levels in Sierra Leone but also to their improvement to meet the targets of the African Water Vision 2025 and the Millennium Development Goals.

K.Y. Amoako, Executive Secretary

## **LIST OF ACRONYMS**

COM	-	Community Ownership and Management
DANIDA	-	Danish International Development Agency
DCs	-	District Councils
DFID	-	Department of International Development
EIA	-	Environment Impact Assessment
EU	-	European Union
GDP	-	Gross Domestic Product
GOSL	-	Government of Sierra Leone
GTZ	-	German Agency for Technical Co-operation
GVWC	-	Guma Valley Water Company
IDA	-	International Development Association
IDB	-	International Development Bank
IDWSSD	-	International Drinking Water & Sanitation Decade
IMF	-	International Monetary Fund
IPRSP	-	Interim Poverty Reduction Strategy
JICA	-	Japan International Co-operation Agency
LG	-	Local Government
MDA	-	Municipal, Districts and Assembly
MDGs	-	Millennium Development Goals
MW	-	Mega Watts
NCP	-	National Commission for Privatization
NGO	-	Non-Governmental Organisation
NPA	-	National Power Authority
NRS	-	National Reform Strategy
NWSSF	-	National Water Supply and Sanitation Forum
NWSSP	-	National Water Supply and Sanitation Programme
O&M	-	Operation and Maintenance
NRA	-	National Revenue Authority
PETS	-	Public Expenditure Tracking Surveys
SALWACO	-	Sierra Leone Water Company
SL	-	Sierra Leone
UN-ECA	-	United Nations Economic Commission for Africa
UNHCR	-	United Nations High Commission for Refugees
UNICEF	-	United Nations Children Fund
VIP	-	Ventilated Improved Pit

WATSAN	-	Water and Sanitation
WATSANC	-	Water and Sanitation Committee
WATSANB	-	Water and Sanitation Board
WHO	-	World Health Organisation
WRC	-	Water Resources Council
WSD	-	Water Sector Development
WSS	-	Water Sector Supply

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## **1 BACKGROUND**

The GOSL believes that access to good drinking water and safe sanitation facilities by its fast growing population of 5.6 million people (2001) of whom about 70% live in the rural areas is necessary to improve health, reduce poverty, increase production and set her on a path of sustainable economic growth and development.

Consequently, the GOSL established the Guma Valley Water Company for the city of Freetown, and the Water Supply Division of the Ministry of Energy and Power to be responsible for water supply and sanitation outside Freetown. Later SALWACO was established to take over selected urban water supply systems outside Freetown. It is now responsible for urban and rural water supply and sanitation outside Freetown.

After Sierra Leone attained independence and especially during the IDWSSD (1981-1990) considerable progress was made to install various types of water supply and sanitation facilities that brought the national coverage from 2% and 1% for water supply and sanitation respectively at the beginning of the decade to 35% and 5% at the end. However, as a result of inadequate finance for investment and maintenance and destruction of infrastructure during the decade-old civil war (1991-2000), the water supply coverage fell to 15% while the sanitation coverage remained at 5%. This has resulted in increased water-borne diseases and high infant mortality rates which have impacted more adversely on women and children. After the civil war and as a result of measures taken during the period of the National Recovery Strategy (2000-2003), the coverage has improved to 22% and 15% respectively.

The GOSL finds the present coverage very inadequate. First in spite of the fact that Sierra Leone is endowed with vast water resources there is inadequate water in the dry season to meet drinking and industrial water needs. Secondly in spite of the fact that there are many stakeholders in the sector, there is no national policy guideline and action plan for the country and every stakeholder is using its own method of service provision.

In view of this, the GOSL has decided to prepare this policy and guidelines on water and sanitation for proper co-ordination of stakeholders' activities in order to ensure efficient and accelerated service delivery.

### **1.1 Objectives**

The overall objective of this policy is to manage the water resources of Sierra Leone in an integrated manner to support social and economic development in the fields of health, agriculture, and energy and to maintain the productivity and integrity of the environment on a sustainable basis.

The specific objective is to improve the health of the people through the provision of water supply and sanitation facilities and services to meet the Millennium Development and Sierra Leone's Vision 2025 Goals and to contribute to poverty reduction, sustainable economic growth and development.

## **1.2 *Scope of the Policy***

The scope of the policy is to include: -

- The need for setting up national standards on water supply and sanitation;
- The need to establish standardized codes of practice in water supply and sanitation programmes;
- The need for a national policy guideline on water and sanitation;
- The need for assessing the bacterial purity and chemical composition of drinking water sources in the country;
- Capacity building for Institutions to be able to carry out water quantity and quality monitoring;
- Ways of involving and promoting community participation in water supply and sanitation programmes;
- Effective mechanisms to advocate for political commitment by concerned Authorities and
- Formation of a Task Force with specific terms of reference.

## **1.3 *Process for Developing the Policy***

The process for the preparation of this policy began with a national consultation in September 2004 at which thematic issue papers were prepared, discussed and recommendations made. It was followed by consultations and interviews of key persons and collection of documents both in Freetown and in the field. The data and information collected were analysed and the outcomes were used to prepare a draft report that was reviewed at a second national consultative meeting in February 2005.

This final policy document has been prepared incorporating comments received at the second consultative meeting.

## **1.4 *Structure of the Policy Document***

This final policy document was prepared taking into consideration the comments and additional information provided at the second consultative meeting.

The report is in nine (9) parts. The first part gives the background of the project and the processes. The second part briefly describes the country

context with respect to socio-economics, land use/land cover, political administration, economic performance and political/security outlook.

The third part of the report presents information about the water resources and the organizations operating in the water sector, their roles and functions. The constraints to developments in the water sector and the challenges that policy should address are presented in the fourth part. The fifth part presents policy guidelines and the framework for action to overcome the constraints.

The sixth, seventh and eighth parts are addressed to policy guidelines and strategies for:

- Water resources management;
- Overall water supply and sanitation;
- Rural water supply and sanitation respectively.

Specific guidelines for implementing the policy for rural water supply and sanitation are presented in Appendices 1 to 9.

## **2 COUNTRY CONTEXT**

### **2.1 Basic Information**

#### *Physical Characteristics*

The country has an area of 72,000 km<sup>2</sup>, with a coastline of about 400 km on the Atlantic and shares boundaries with Guinea and Liberia. It is bordered on the north-east by mountain ranges rising to a peak of about 1950 metres.

#### *Socio-Economic Characteristics*

The 2001 estimated population was 5.6 million with an annual growth rate of 2.6%. About 70% of the population is rural.

The literacy rate is 31.4% and life expectancy is 37 years. The infant mortality rate is 170/1000 live births, and the under five mortality rate is 286/1000.

Its exports are primary commodities namely, minerals and timber. The GDP per capita in 2002 was \$142 having fallen from \$237 in 1990.

#### *Political/Administrative Areas*

The country is divided into four administrative provinces namely, the Southern, Eastern, Northern and Western provinces with provincial capitals at Bo, Kenema, Makena and Freetown. There are a total of 13 Districts under the provinces. The Districts are made up of the Chiefdoms in which towns and villages are located.

#### *Land Cover / Land Use*

The northern part is covered with savannah vegetation, while the central and eastern parts are covered with forests. The coastal areas where the rivers enter the sea are covered with mangroves.

Arable land is about 7% of the land area with 32% covered by permanent pastures and crops. Forests, woodlands and others make 61%. Land area irrigated in 1993 was estimated at 290 km<sup>2</sup>.

Uncontrolled development, poor land use and deforestation are causing land degradation and sedimentation problems in watersheds.

### **2.2 Economic Outlook**

Sierra Leone's economy depends upon primary commodities in agriculture and mining. The main agricultural crops are cocoa, coffee, ginger, groundnuts and cassava. Oil palm and rice are other crops

grown. Livestock are reared in the northern savannah areas. The mining industry is prominent with diamond, gold iron ore, utile and bauxite.

Sierra Leone is in a political and economic transition, having only recently emerged from a decade-old civil conflict that had destructive consequences on the nation's political and economic institutions, as well as its physical infrastructure, including water infrastructure. The challenges facing the government, therefore, range from security concerns and economic recovery through implementation of a broad spectrum of institutional reforms. With peace, inevitably, come high expectations that government will provide a clear way forward for post conflict reforms and rehabilitation/reconstruction of dilapidated infrastructure.

Although the country is in transition, it has continued to make good progress towards achieving economic recovery in the post-conflict period (2000-2004). The economy is heading in the right direction, although it is still well below the 7% average needed to achieve the Millennium Development Goals (MDGs).

Continuation of this positive trend however requires a stable macro-economic environment, a more efficient public sector, affordable and sustainable links between Sierra Leone's poverty reduction strategy and the budget and an increase in private sector (both foreign and local) investments. Another critical need is the necessity to increase and diversify the export sector and aggressively seek out export niches and opportunities.

Good macro-economic policies are being put in place. The ongoing economic reform and capacity building programmes represent a major shift in government's approach to promoting growth and development. They represent a welcome change in policy direction from a predominantly state-controlled and centralized economy to a market driven and decentralized one. The programmes have tended to focus on structural reforms, particularly public, legal, regulatory, and local ones.

The recently finalized PRSP also provides a framework to work towards achieving a middle-income status, reducing poverty, infant mortality and maternal morbidity as well as improving the overall welfare of all Sierra Leoneans.

The major ongoing efforts include interventions in the power and water sector, establishment of the National Revenue Authority (NRA), The Public Expenditure Tracking Surveys (PETS), Procurement Reform, Infrastructural Improvements, Institutional Reform and Capacity Building, Creation of the National Commission for Privatization (NCP), etc. These programmes together with massive investments in basic

social services are likely to bolster current trends and make growth more pro-poor.

At the regional level, the strategy should be to seek enlarged markets and exploit complementarities, economies of scale and synergies by deepening cooperation and integration efforts.

There are hopeful signs that Sierra Leone will, if the security situation continues to improve, achieve sustained periods of macro-stability, improve the delivery of public services and transform the economy from its agrarian and mining orientation to an industrial economy.

The requisites of a bright economic future include political stability, equitable distribution of resources (the local councils are a move in this direction), a well-trained and motivated workforce and a well-developed transport infrastructure. All of these are achievable with the right frame of mind, much reduced political interference in technical decision-making and a detribalized workforce where employment is based on merit and proven ability.

A key policy level challenge to achieving prosperity in Sierra Leone is to ensure that the programmes aimed at macro-economic stability and economic recovery are not only consistent with growth but are also affordable and feasible. Through sheer hard work, sound government policies, a better image and ensuring the fundamentals of law, security, health and education, there is no doubt that this can be Sierra Leone's millennium.

### **2.3 *The Security Situation***

The security challenges facing a country emerging from a protracted civil war are varied, urgent and explosive. Peace inevitably breeds high hopes and expectations (most of them unrealistic and unachievable). Armed robberies, ambushes, physical assault, etc. become the order of the day. The large numbers of ex-combatants roaming the streets of large towns and terrorizing the countryside pose a constant threat to the very fragile peace situation.

The fulfillment of the post-conflict hopes and aspirations therefore take on an air of extreme urgency and require a four-pronged strategy in the crucial areas of politics, economics, social and cultural regeneration. At the centre of this all is the objective of restoring the country's battered economy.

The lessons learned so far are that economic policies and programmes should be conceived in such a way as not to neglect their social dimensions. The protracted civil war was attributed to disparities in

service provision (education, health, social, amenities, roads etc.) especially in the rural areas. The unemployed youths provided a convenient breeding and recruitment ground for the rebel outfits. The poor roads infrastructure also hampered and frustrated deployment of government troops, and at times even encouraged defections to the rebel groups.

Government now accepts that efforts at any recovery programme should include opportunities for economic growth and opportunities for citizens to improve their lives. The macro-economic importance of the transition programme calls for building the economy, adopting an integrated and sustainable development programme, meeting basic needs and ensuring peace and security for all.

The United Nations (UNAMSIL) and Britain (IMATT) have contributed immensely to the restoration of peace and security nationwide. The training programmes for the army and police personnel, the provision of much-needed logistical support, the disarmament programme and current efforts at reintegrating ex-combatants into society are all positive indications that peace is at last here to stay.

### **3 WATER RESOURCES AND SECTOR ORGANISATION**

#### **3.1 Water Resources**

##### **3.1.1 Climate**

The country lies in the hot humid area of West Africa with wet and dry seasons. The mean annual temperature is 26°C ranging from a minimum of 22°C in August to a maximum of 35°C in February. Mean annual rainfall is a high 5,000 mm in the Freetown peninsular to 1800 mm in the north east. The dry season is from November to April. About 5-20% of the annual rainfall occurs during this season. The wet season months are from May to October. The mean monthly solar radiation varies from 380 cal.Cm<sup>-2</sup>day<sup>-1</sup> in March to 250 cal.Cm<sup>-2</sup> day<sup>-1</sup> in August.

##### **3.1.2 Drainage**

The country is drained by nine major rivers. These are the Rokel/Seli, Pampana/Jong, Sewa, Waanje and the Coastal Streams and Creeks that originate from within the country. The rest are the Great and Little Scarcies and Moa Rivers that originate from the Fouta Jallon Plateau in the Republic of Guinea, and the Mano River that originates from the Republic of Liberia. These rivers range in length from 160 km for the Great Scarcies to 430 km for the Sewa River and in area from 2,530 km<sup>2</sup> for the coastal streams and creeks to 14,140 km<sup>2</sup> for the Sewa River. This information is presented in Table 1.

Out of the nine major river basins, four (Great Scarcies, Little Scarcies, Moa and the Mano) are shared with neighbouring countries.

##### **3.1.3 Runoff**

The monthly runoff for the river basins follows the variability of the rainfall. The total mean annual runoff from the river basins is of the order of 160 km<sup>3</sup>.

##### **3.1.4 Groundwater**

Most of the country is underlain by Precambrian crystalline formations, which have no primary porosity. Groundwater accumulation therefore occurs in fractures, joints and fissures. The aquifers are therefore discontinuous.

##### **3.1.5 Water Resources Problems**

Sierra Leone is endowed with vast water resources consisting of both surface and groundwater resources. However, these resources are unevenly distributed in space and time and in the dry season in particular, they are inadequate to meet the country's needs. The resources are also threatened with rapid population growth, increased industrial activities, environmental degradation causing soil erosion,

drainage of wetlands and pollution of rivers. Also knowledge about the resource is inadequate.

There is no central body responsible for the management of the water resources towards meeting the needs of socio-economic development and those of the environment. The existing laws and regulations are scattered in different enactments.

Table 1: Total Length and Area of River Basins

<b><u>River Basin</u></b>	<b><u>Total Length (Km)</u></b>	<b><u>Area (Km<sup>2</sup>)</u></b>	<b><u>% Area</u></b>
Great Scarcies	160	3115	4.3
Little Scarcies	280	13000	17.9
Rokel/Seli	380	10620	14.8
Pampana/Jong	300	7511	10.4
Sewa	430	14140	19.7
Waanje	200	4510	6.2
Moa	320	9220	12.7
Mano	180	2530	3.4
Coastal Streams/Greeks	120	6969	9.6

*Ref: ESCG (1988): The study on watershed degradation in Sierra Leone.*

### **3.2 Institutional Framework of the Water Sector**

The following institutions operate in the water sector in Sierra Leone.

#### **3.2.1 Ministry of Energy and Power**

The ministry is responsible for the Water Energy and Power Sectors. Together with the Ministry of Health and Sanitation, it is responsible for Water Supply and Sanitation. It is therefore responsible for formulating policies and plans, their co-ordination, monitoring and evaluation to achieve the government's development objectives in the water and sanitation sector.

#### **3.2.2 Guma Valley Water Company**

It is a parastatal established in 1961 by an Act of Parliament, and is responsible for the water supply of the city of Freetown and its environs. It operates under the Ministry of Energy and Power. It has power to control water abstraction and pollution in the catchment upstream its water sources. It is also expected to be self-financing.

#### **3.2.3 Water Supply Division of MEP**

This division covers urban and rural areas outside the areas served by the GVWC. Its operations are guided by the Water Supply and Control Act of 1963. Hence it has power to control water abstraction and pollution in the catchment behind its water supply sources.

#### ***3.2.4 Sierra Leone Water Company***

With the growth in urban and rural settlement and the transfer of the Water Supply Division from the Ministry of Works, to the Ministry of Energy and Power, it became clear that a new organization was required to meet the needs of the growing population. The Sierra Leone Water Company (SALWACO) was therefore established in 2001 to be responsible for urban water supplies in the whole of Sierra Leone outside the jurisdiction of the Guma Valley Water Co. It is also under the Ministry of Energy and Power. Like the GVWC, it has power to control water abstraction and pollution in the catchments from which it takes water for its supply areas. The water supply systems under its control are expected to be self-financing.

#### ***3.2.5 Land and Water Development Division***

This is under the Ministry of Agriculture, Forestry and Food Security. Its functions include improving the conservation and effective use of land and water resources and provide agro-climatic data for sustained agricultural production; carrying out land evaluation for classification of inland valley swamps and other ecologies for suitability in irrigated rice production; developing a national irrigation and drainage programme to reduce the dependency on rain fed agriculture and collecting data on surface and groundwater resources.

#### ***3.2.6 The National Power Authority***

This is responsible for the planning, development, utilization and conservation of the power resources of the country including that of hydropower. It is under the Ministry of Energy and Power.

#### ***3.2.7 Environmental Health and Sanitation Department***

This department is under the Ministry of Health and Sanitation, and it is responsible for both urban and rural health and sanitation matters. Its activities cover water supply in rural and urban areas, sanitation and waste management in rural and urban areas, housing, vector control, food hygiene and safety and enforcement of environmental sanitation standards.

#### ***3.2.8 Department of Environment***

This is under the Ministry of Lands, Country Planning and the Environment. It is responsible for co-coordinating all the environmentally related activities of Government Ministries and local authorities and act as the focal point of all national and international environmental matters relating to Sierra Leone.

The impact of the use of environmental resources (land, minerals, forests, wild life, etc.) and their mitigation on water resources is an important aspect of the department's functions.

***3.2.9 National Privatization Commission***

An Act of Parliament established this. It is under the Ministry of Finance. It is required to manage parastatal organizations to such a stage that they become attractive for divestiture entirely to the private sector or where the private sector can become a partner under various arrangements with government to take over public sector organizations in the production and service sectors of the economy. The commission must guide GVWC in its efforts to be self-financing with private sector involvement.

***3.2.10 Ministry of Local Government and Community Development***

This Ministry has been given the role to champion the government policy of decentralization and devolution of power to the grassroots under the Local Government Act of 2004. It is expected to build the capacity of District Councils and Town Councils to assume their new responsibilities in providing government services including water supply and sanitation in the rural areas. Among the functions that have been devolved to the Local Councils is that of water supply and sanitation presently assigned to SALWACO under the Ministry of Energy and Power. It will also co-ordinate the policies and programmes of the various ministries, departments and agencies as they relate to the water and sanitation sector.

***3.2.11 Ministry of Planning and Economic Development***

In view of the role of water in domestic, agricultural, industrial, commercial, energy use and the environment, economic planning and development must be integrated with water management. In the area of water resources development, it has responsibility for the formulation of national development objectives, strategies and implementation. It mobilizes both internal and external funds for projects including those of the water sector.

***3.2.12 Ministry of Finance***

The Ministry is responsible for mobilizing government revenue, and marshalling other activities to finance government budgets including raising internal and external loans and their repayment.

***3.2.13 Development Partners***

These consist of governmental and non-governmental organizations. The non-governmental ones work directly with communities to provide water supply and sanitation facilities. They include CARE, Action Aid, Water Aid, World Vision, OXFAN, Pan International, etc. The governmental ones include EU, UNICEF, GTZ, World Bank, Danida, and JICA.

The involvement of the agencies in the regions as of 2003 is presented in Table 2.

Table 2: Donors and NGOs operating in the Regions

<b>Western Region</b>	<b>Southern Region</b>	<b>Eastern Region</b>	<b>Northern Region</b>
UNICEF UNHCR, EU NaCSA	UNICEF UNHCR EU, NaCSA IRC	UNICEF UNHCR, EU NaCSA, IRC Tearfund ECHO, OXFAM OFDA, ACF RPDA, ICRC PWJ, COOPI	UNICEF, UNCHR NaCSA, EU, ECHO, DFID, CRP, Tearfund, ACF, Cause Canada, CARE

The agencies have recently revived a technical committee with 5 core members (SALWACO, UNICEF, CARE, ACF and OXFAM) and they are trying to put in place norms and procedures which will guide them all in their work. The current issues being considered are:-

- Hand pump policy
- Water quality testing and equipment
- Standardized reporting template for water construction, to feed into a national database.
- Standardized data recording at water points.

## **4 WATER SECTOR CONSTRAINTS AND CHALLENGES**

The present state of water resources utilization for domestic, industrial, agricultural, hydropower generation purposes and occurrence in the environment are due to various constraints that have bedeviled Sierra Leone in the past few decades.

Sierra Leone had a buoyant economy at the time of Independence in 1961. This continued to the end of the 1960s. However, in the two decades that followed ( 1970s and 1980s), internal difficulties from the mining industries and external difficulties due to fall in the world market prices for Sierra Leone's main foreign exchange earning (primary commodities: gold, diamonds, and timber), the economy began to run down. The balance of payments position and macro-economic fundamentals were negatively affected. Business, agriculture and industry suffered. So were economic infrastructure and social services. Attempts to put things right did not succeed for lack of support from the IMF and the development partners. Without investment funds, operation and maintenance and expansion of infrastructure were impossible and most of them ran down, while some completely broke down.

The 10-year old war (1991-1990) had a very negative impact on the social and economic life and the environment of the country. Apart from the slaughter and maiming of people, many became dislocated. This is attested by the influx of people from the villages into Freetown, Kenema, Makena and other big towns. Freetown alone is estimated to have seen an increase of 1.0 million people. In addition, many educated and professional people and technicians left the country. Infrastructure such as roads, water supply systems, schools, hospitals, public buildings, etc. were damaged. Water supply facilities either went out of operation or were operated at reduced capacities. Communications, movement of goods and supplies were difficult and it was also difficult to govern. The Government at one time during the period had to go into exile.

Power was concentrated at the centre in Freetown. There was little or no involvement and participation at lower levels of administration- the Districts Chiefdom and Village levels.

### **4.1 *Water Resources Management***

Sierra Leone is endowed with vast water resources both surface and groundwater. These resources are unevenly distributed in space and in time. In the dry season there appears to be acute shortage of water to meet drinking water supply needs in urban and rural settlements. The demands on the resources are increasing and also threatened by rapid population growth and shift, increased industrial activities, environmental degradation causing soil erosion and pollution of wetlands. The laws for managing water are scattered and in different

enactments. For example, the licensing of water abstraction is given to GVWCO, SALWACO and the Chief Engineer of the Public Works Department. The same applies to catchment management that is also provided for in the Forestry Regulations and the Environmental Protection Act. There are no effective arrangements to implement the laws at the local level.

Sierra Leone shares four of its major rivers with neighbouring states i.e. Guinea and Liberia. There are arrangements for co-operation to manage the resources of the Mano River to meet the legitimate and equitable needs of the riparian countries. The arrangements are not being implemented for lack of political will and capacity. No arrangements have yet been put in place to manage the Great Scarcies, Little Scarcies and Moa river basins that Sierra Leone shares with the Republic of Guinea.

### ***Constraints***

The problems of water resources management are due among other things, to:-

- i) Lack of a central body that will ensure that resources are managed in an integrated manner to meet the demand for socio-economic development and the demands of protecting the resources and maintaining the productivity of the aquatic and terrestrial ecosystems for present and future generations.
- ii) Lack of policies to respond to climate variability and change to ensure that there is a coping mechanism when water occurs in extremes (i.e. floods and droughts).
- iii) Inadequate knowledge about the water resources both surface and groundwater.
- iv) The laws and regulations for water resources management are scattered in different legislations leading to inertia.
- v) Lack of public awareness on the need to manage water resources.
- vi) Lack of participation and capacity in the management of water resources at national, provincial, district and community levels.

### ***Challenges***

To overcome the above constraints the following challenges must be met:-

- i) Developing comprehensive plans for the integrated management and efficient use of water resources;
- ii) Developing an institutional framework that addresses fundamental human needs, ecosystems, and conservation and promotes local participation in the management of the water resources.
- iii) Encouraging capacity building efforts to make available the knowledge and the skills necessary to manage water resources at various levels.
- iv) Developing appropriate legal and regulatory frameworks;
- v) Strengthening basic and further professional training institutions in water management, or create them, where necessary; and

- vi) Monitoring and carrying out an assessment of water resources availability (surface and groundwater) qualitatively and quantitatively.

#### 4.2 *Drinking Water Supply*

Despite these vast resources, the country currently faces severe constraints in the availability of water for domestic and agricultural purposes. National and District coverage of water and sanitation are presented in Table 3. The national average water supply coverage is 22% and ranged from 14% for Kailahun to 46% for the Western Area, while sanitation ranged from 6% in Kailahun to 15% in the Western Area. The present national coverage of 22% for water supply compares unfavourably with 35% achieved at the end of the IDWSSD in 1990.

Table 3: Water Supply and Sanitation Nationwide (2003)

<b>Item No.</b>	<b>DISTRICT</b>	<b>COVERAGE (%)</b>	
		<b>Water</b>	<b>Sanitation</b>
1	KAILAHUN	14	6
2	KENEMA	22	12
3	KONO	15	10
4	BO	25	10
5	PUJEHUN	20	13
6	MOYAMBA	25	15
7	BONTHE	15	10
8	TONKOLILI	20	10
9	BOMBALI	17	12
10	KOINADUGU	21	10
11	PORT LOKO	20	12
12	KAMBIA	25	10
13	WESTERN AREA	46	15
<b>AVERAGE</b>		<b>22</b>	<b>15</b>

Source: DEPA January, 2004

#### *Constraints to drinking water supply*

The low levels of coverage are due to the following institutional, water resource, infrastructure, financial, participation and capacity constraints. Among these are:-

- i) Dry season shortages due to:-
- Inadequate storage;
  - Depletion of water resources arising from deforestation;
  - Absence of drilling capacity to access the deeper aquifers;
  - Lack of biophysical data and information (e.g. hydro-meteorological) to assess the available surface and groundwater resources;

- Inability to utilize other water conservation techniques such as rainfall harvesting;
  - Loss of water in the water supply transmission and distribution systems.
  - Inability to plan to meet rising demand, due among other things to demographic shift in such places as Freetown and the provincial capitals;
  - Inability to respond to climate variability and change.
  - Inability to control pollution of rivers.
- ii) Many installed systems not functioning for lack of maintenance or vandalism.
  - iii) Inadequate maintenance due to lack of spare parts and insufficient commitment on the part of some WATSANS and caretakers to perform their jobs.
  - iv) Inability to raise capital to finance the rehabilitation and expansion of existing systems and construction of new ones.
  - v) Lack of clear policy on capital cost, O&M and cost sharing.
  - vi) Lack of mechanism for setting tariffs to ensure affordability and ability to pay;
  - vii) Inability to recover costs (O&M) from beneficiaries and institutions of GOSL
  - viii) Lack of participation by beneficiaries in setting tariffs.
  - ix) Lack of awareness of the need to make payment because water is perceived as a natural gift.
  - x) Unwillingness to pay due to poor service.
  - xi) Capital & O&M cost sharing arrangements not being fulfilled by GOSL.
  - xii) Overburdening of government finances.
  - xiii) Inadequate participation of community leadership and members.
  - xiv) Inability to recognize and cater for the special role of gender (particularly women & children)
  - xv) Lack of involvement of beneficiaries in the choice of infrastructural technologies
  - xvi) Lack of management of the water resources
  - xvii) Over-concentration of organization at head office without sufficient representation at District level where real development activities take place.
  - xviii) Lack of co-ordination of the institutions in the water and sanitation sub-sector.
  - xix) Inability to enforce regulations such as pollution control and quality standards.
  - xx) Lack of clarity in ownership, management and over-concentration on the public sector institutions without involving the private sector.
  - xxi) Inadequate data and information about water resource (surface and groundwater) for planning, operation and maintenance.
  - xxii) Insufficient data on consumers for setting tariffs.
  - xxiii) Insufficient data on coverage for planning.

- xxiv) Inadequate sanitation infrastructure to maximize the benefits from providing safe drinking water.
- xxv) Inadequate capacity of the local councils in the urban centres to manage garbage and excreta in a safe manner.
- xxvi) Lack of organizational, manpower, finance and information capacity of the various institutions at central, provincial, district, chiefdom and town/village levels.

### ***Challenges***

To overcome the above constraints so that coverage can be increased to meet Vision 2025 targets, the following challenges must be addressed:-

- i) Managing water resources and applying appropriate conservation technologies to meet demand in the dry seasons.
- ii) Increasing the participation of women in decision-making;
- iii) Mainstreaming gender in Hygiene Promotion;
- iv) using technologies that take account of capital, operation and maintenance costs;
- v) Enforcing regulations and apply appropriate sanctions for violation of pollution laws;
- vi) involving communities in determining tariffs;
- vii) Making tariff setting transparent
- viii) Improving knowledge about and management of water resources to meet the needs of other sectors and the environment.
- ix) Applying regulatory policies that allow private participation and eventually reduce dependence on donors
- x) Promoting public and private partnership
- xi) Re-enforcing the policy of government payment for water consumed
- xii) Charging fees for urban wastewater.
- xiii) Developing effective financial system
- xiv) Decentralizing regulatory bodies
- xv) Training professionals locally to be able to address national problems.

### **4.3 *Water for Agriculture and Food Production***

In spite of its abundant water resources, the country is mainly a rain fed agricultural country. Agriculture accounts for about 40% of the Gross Domestic Product. The arable land available is 5.3 million ha, and almost 80% of farmers cultivate less than 10% of the land. Almost 90% of the country's staple food is imported. The import bill for 2001/2002 alone was \$52. million. The nutritional level has gone steadily down since 1980. The daily calorie intake per capita fell from 2087 Kcal in 1980 to 2035 Kcal in 1998 as compared with the average of 2663 Kcal for developing countries. The use of irrigated water for production is minimal. There is however, some water management in the Inland Valley Swamps to control water for rice and fish production after the rains.

***Constraints to Water Use in Agriculture and Food Security***

The following are among the constraints in managing water resources in the effort to achieve food security:

- i) Erratic and high intensity rainfall that erodes vulnerable soils;
- ii) Unevenly distributed and unpredictable rains that upset farming;
- iii) Poor water control in swamps and low-lying areas leading to salinity accumulation and iron toxicity;
- iv) Lack of adequate database on water resource of Sierra Leone.
- v) Inadequate training (formal or informal) in water resources management;
- vi) Deforestation due to shifting cultivation, mining, urbanization infrastructural development, logging for timber, fuelwood, etc.
- vii) Inadequate co-ordinated support from other sectors for agriculture, inland fisheries and aquaculture; and
- viii) Limited credit for financing irrigation and other capital-intensive investments involving water.

***Challenges***

The challenges facing use of water to increase food production to achieve food security include:

- i) Providing an enabling environment for equal opportunity to access, control and participate in water resources management;
- ii) Formulating the right of women in decision making to access, control and participate in water issues for food production;
- iii) Mainstream food security programmes in all ministries, especially:
  - Ministry of Works
  - Ministry of Trade and Industry
  - Ministry of Fisheries and Marine Resources
  - Ministry of Local Government and Community Development, etc.
- iv) Developing inter-departmental cooperation between Ministry of Agriculture, Forestry and Food Security and the Ministry of Trade and Industry for protection of local markets;
- v) Managing the river catchments to reduce deforestation and its impacts;
- vi) Building capacity to use water for irrigation of crops to increase food production;
- vii) Providing support for research in water resources management for food production; and
- viii) Supporting institutions providing credit for irrigation schemes to increase food production.

**4.4 Water for Energy**

The hydropower potential of Sierra Leone is estimated at 1513 MW, scattered in 27 sites across the country. There are considerable flow variations between wet and dry seasons at these sites.

At present, two sites have been developed. These are a 2.4 MW plant at Guma and a 4 MW plant which supplies part of the electricity needs of Bo and Kenema. The third plant has been out of service since 1982, for lack of maintenance. A plant is being built at Bumbuna with an installed capacity of 47 MW with a 203 km long transmission line intended for the Western Region. The construction has been set back because of destruction caused by the decade old war. In 1995, the national installed capacity for electricity generation was 42 MW. Of this, 5% was accounted for by hydropower generation.

***Constraints to water use in Energy***

The constraints to the use of water in energy production include:-

- i) Insufficient human resources compounded by gender imbalance at the technical level;
- ii) Lack of participation in planning hydro power projects to take care of the energy needs of rural communities including those of women who are involved in household energy use and management;
- iii) Lack of finance for the expensive large hydropower projects which on the other hand are cheaper to operate;
- iv) Current hydro-projects are donor funded with no private sector participation;
- v) Unclear supervision, management and control of the hydro-power sub-sector;
- vi) The 1982 NPA Electricity Act which is an impediment to creating an enabling environment for participation in the electricity generation sub-sector;
- vii) The Energy Division of the Ministry of Energy and Power which lacks the technical capacity to plan, coordinate, monitor and develop a data repository; and
- viii) Cultural and traditional beliefs.

***Challenges***

To increase the use of hydropower in meeting the energy needs of the country, the following challenges will have to be met:-

- i) Undertaking planning studies and capacity building that involves beneficiaries;
- ii) Putting proper policies and legislative framework together to harmonize with existing policies;
- iii) Creating a Water Resources Council to manage the water resource and ensure its use for hydropower generation;
- iv) Promoting awareness about management of water resources among local communities;
- v) Drawing up environmental management plans for activities that adversely impact on water resources and also for hydropower projects which impact adversely on the environment.

- vi) Installing hydro-meteorological stations on main rivers and their tributaries, particularly near the location of identified future hydropower projects;
- vii) Establishing a hydro resource map of the country based on existing and new hydro-meteorological data;
- viii) Carrying out feasibility studies for identified future hydropower projects so as to select the best alternative (e.g. Yebin 1 and Yebin 2);
- ix) Updating the study on “Power Section Master Plan” for Sierra Leone carried out by Lahmeyer International in 1996;
- x) Determining the most appropriate hydro-generation expansion plan based on the above updated study;
- xi) Putting in place a more appropriate policy, legal and regulatory framework conducive to increased private sector participation in hydro-based electricity generation;
- xii) Devising and implementing innovative financing mechanisms for the development of micro/mini hydropower projects within the Rural Electrification Strategy and Plan; and
- xiii) Revising NPA Act 1982 and enacting a new electricity law that provides incentives to private investors in the provision of hydro-based energy services to rural areas.

#### **4.5 Water and Environment**

Rainfall shows variability in space and time. Apart from annual and seasonal variabilities, changes in climate caused by greenhouse gas emissions into the atmosphere could cause changes in the long-term average amounts of rainfall. In the decades of the 70s and 80s, there has been decreasing rainfall in West Africa particularly in the Sahel region. Droughts seem to be more frequent.

Climate variability and change affect the water available in the environment for domestic and industrial water supply, hydroelectric power generation, irrigation, etc. These are borne out by the difficulty of satisfying demand for domestic water from hand dug wells and boreholes and from impounded reservoirs in the dry season.

Agriculture affects water in the environment because of erosion from uplands causing sedimentation of reservoirs. It also causes pollution of surface waters from use of agrochemicals. These impact negatively on human health and the flora and fauna in the aquatic ecosystem. Coastal and inland transportation may lead to pollution from propulsion engines. Mining and drilling operations contribute to these environmental problems in Sierra Leone. The increase in population particularly of the urban centres of Freetown, Bo, Makena and Kenema during the war has increased wastes that find themselves directly and indirectly into water bodies. These cause degradation in the quality of freshwater for use by humans and the fauna and flora in the aquatic ecosystem. Deforestation can lead to depletion of the water resources thereby putting the sustainability of projects in jeopardy. Construction of roads, bridges and

jetties will increase siltation and pollute surface and groundwater resources.

***Adverse impacts of water projects on environment***

The following adverse physical, social and economic impacts are caused by water projects on the environment:-

- i) Water projects involving damming may cause:-
  - a) Inundation of settlements, farmlands, etc.;
  - b) Reduced flows down-stream, or flooding when spillways are opened. These create conflicts among upstream and downstream users;
  - c) Imbalances in the aquatic ecosystem; and
  - d) Increase in water-borne diseases such as malaria and bilharzia.
- ii) Water projects based on groundwater could cause groundwater contamination:
  - a) If well heads are not properly drained; and
  - b) Wells and boreholes are improperly sited near cemeteries, refuse dumps, toilets, etc.;
- iii) Water projects whose sources are not properly protected for lack of adequate regulations risk being depleted;
- iv) Water projects involving land use for pipelines, standpipes, etc. for which compensations are not paid cause social and economic distress to land owners;
- v) Water projects based on sophisticated technologies could cause technical problems in their O&M and also result in tariff levels beyond the ability of beneficiaries to pay; and
- vi) Water projects requiring payment of water bills in communities that are, unfamiliar with payment for water could cause social and financial problems.

***Challenges***

To abate or eliminate the adverse effects caused by water projects on the environment, the following challenges should be addressed:-

- i) *Eliminating water-borne diseases by:*
  - Proper siting of wells, etc.;
  - Drainage of immediate surroundings; and
  - Treatment of water e.g. chlorination.
- ii) *Avoiding groundwater contamination by:-*
  - Proper siting of wells; and
  - Proper design, O&M.
- iii) *Managing waste material disposal by* disposing waste water in acceptable manner (recycling, deposition in land filling)
- iv) *Reducing water flow downstream by:*
  - Undertaking EIA;
  - Consulting with users; and
  - Changing locations or designs.
- v) *Eliminating potential risk to aquatic ecosystem by:*
  - Undertaking EIA;

- Assessing vulnerability;
  - Changing design; and
  - Undertaking restoration works.
- vi) *Reducing community dependence on external assistance for sophisticated systems by:*
- Setting up WATSAN Committees;
  - Undertaking awareness raising campaign; and
  - Technical training of Local Government authorities and community members; and
  - Undertaking monitoring exercises.
- vii) *Ensuring need to pay for water by:-*
- Sensitizing communities; and
  - Setting water tariffs in consultation with communities.
- viii) *Ensuring proper land use by:*
- Avoiding densely populated areas;
  - Avoiding areas with many commercial vehicles; and
  - Implementing RPF involving compensation, resettlement and monitoring.
- ix) *Controlling pollution of water resources from social and economic activities by* developing capacity (including manpower, legal, financial information and logistics) to enforce compliance with the Forestry Law.

## **5 POLICY GUIDELINES AND FRAMEWORK FOR ACTION**

As part of the process to formulate the water and sanitation policy, a situation analysis to identify constraints and challenges in various sectors that use water was presented in the previous chapter. This is to allow rational strategies to be developed to address them. Secondly, the process should be guided by previous, current or intended policies at the macro-sector and sub-sector levels.

Following the end of the decade-old war, the international donor community led by the IMF and the World Bank assisted Sierra Leone with a number of credits and loans. These were conditional upon policy reforms aimed at macro-economic stability, rehabilitation of social services and economic infrastructure, etc. This was accompanied by medium term planning for poverty reduction, and economic growth on a sustainable basis. The medium term plans were taken from a long-term plan that the GOSL prepared as Vision 2025 and strategies for National Transformation. This was aimed at achieving the internationally recognized Millennium Development Goals. The Vision was to be achieved through 3-year medium term rolling strategies -Poverty Reduction Strategies.

### **5.1 Policy Guidelines**

From the interviews with key persons and the review of documents, guidelines were identified that impact on water sector. These were found from the National Policy Reforms undertaken after the war, the Letter of Sector Policy from the MEP to the World Bank; existing water laws and regulations, and commitments by the GOSL to regional and global policies on water. These are described below.

#### **Guidelines from National Policy Reforms**

In Vision 2025, the GOSL committed itself to various reforms which included agreed roles for various actors in the process of national transformation and on issues like governance, participation etc.

#### **i) Agreed roles for the various actors**

The roles for the actors are as follows:-

- *Government:* To create an enabling environment and ensure that government institutions will adopt policies and programmes to reflect the vision.
- *Private Sector:* To constitute the engine of growth in a competitive and liberal environment providing goods and services.
- *Civil Society:* To be active partners in monitoring implementation through building democratic institutions that will enable differences to be debated and resolved for the common good.

- *Development Partners:* To support government development efforts till Vision 2025 is achieved and Sierra Leone is able to stand on its own.
- ii) *Peace and Security*  
Through creating a safe, violence-free and secure environment for all, freedom from hunger, rule of law, access to justice and respect for human rights and civil liberties; building social cohesion to enable people pull resources and energies together.
- iii) *Economic*  
Creating a stable macro-economic environment, sustainable growth and employment through privatization, divestiture and strengthening public – private sector dialogue. To support this, the Privatization Act of 1994 was passed to set up the National Commission on Privatization.
- iv) *Participation*  
Decentralizing government and devolving power to the lower levels of government and ensure that resources are allocated to these levels.
- v) *Transparency, Accountability at levels of Government*  
This has been backed by the Local Government Act of 2004. The Government is also committed to Gender equity and empowerment. For the poor and vulnerable, safety nets are to be provided to ensure that they have access to basic needs and services.
- vi) *Environment*  
Creating a national awareness about the environment, health and safety. Restructuring the environmental department to enforce environmental regulations. An Environmental Policy and Action Plan and Environmental Protection Act – 2000, support this.

### **5.1.2 Guidelines from Letter of Sector Policy**

In a letter to the World Bank as a condition to obtain grant and credit assistance to rehabilitate infrastructure and improve management in the sector institutions, the MEP set out the following policies:-

- i) *Anchoring the development process*
  - It is a strong ambition of government to develop and strengthen capacity at local government level to undertake various development aspirations of the country.
  - The local government institutions will eventually assume responsibility for management, operation, and maintenance of water supply facilities within each locality.
  - The Sierra Leone Water Company will devolve some responsibilities and relevant staff to the local government structures with a view to building and strengthening capacity at this level.
- ii) *Institutional reform*

A sound institutional arrangement and capacity building at Guma Valley Water Company (GVWC) at managerial level will be implemented.

*iii) Tariffs and cost recovery for urban water supply*

The tariff structure to enhance revenue base at Guma Valley Water Company is grossly inadequate. Against this background, GOSL has decided to establish a water and energy regulatory body that will have the mandate to periodically review issues in the sector with a view to making the sector operate in a much more economic, efficient and satisfactory manner in the best interest of the people.

*iv) Preparation of National Water Supply and Sanitation Policy Guidelines and Strategy*

The Government of Sierra Leone is committed to the establishment of a *National Water Supply and Sanitation Policy Guideline and Strategy*, which is expected to be concluded by June 2006 to address major reform measures such as the establishment of National Water Supply and Sanitation Policy Framework and Strategy for the country by June 2006;

*v) Rural Water supply and sanitation*

- Adopt a demand-response approach concept whereby communities choose service levels based on their perception and technology choice which will influence greatly ability/willingness to pay for their water supply facilities;
- An upfront contribution to capital costs and the full financing of operation and maintenance (O&M) costs by communities as a means to foster ownership of the project;
- Promote private sector participation and provision of urban water supply based on commercial principles;
- Implement and assign management of rural water supply and sanitation schemes to communities with the assistance of local government, NGOs and the private sector;
- Promote rural sanitation and improved hygiene practices through the use of participatory methods, appropriate involvement of district-level health staff and NGOs, and exploration of viable, low-cost technical options;
- Implement cost recovery policies for rural services and tariff regime for urban process that could ensure efficiency and sustainability;
- The Water and Sanitation Services Bill will be developed and enacted;

*vi) Water resources management*

The Water Resources Management Bill will be developed and enacted;

- vii) *Reforms to provide incentive to private sector*
- SALWACO and GVWC will be reformed to promote private sector participation including enabling private sector investment in GVWC and build up capacity in SALWACO to enable the institution to operate and manage water resources development for the sector respectively. To facilitate this directive, the government is committed to reforming the GVWC Act and set up a regulator for urban water sector by June 2005;
  - Improve the management of the GVWC. Staff capacity will be strengthened in the area of financial management and business planning, enabling the implementation of commercial reforms in GVWC, by December 2006. These improvements will be undertaken as part of the implementation of the proposed Power and Water Project;
- viii) *GOSL Budgetary Allocation for Water Supply and Sanitation*  
The Government is committed to the provision of counterpart contribution through its annual budgetary allocation to the Sierra Leone Water Company specifically for this project.

### **5.1.3 Guidelines from existing laws/ regulations**

- i) *Local Govt Control of Water and Sanitation*  
The Local Government Act of 2004 requires that SALWACO:-
- Rural water supply to be run at cost not for profit.
  - Community ownership of wells.
  - Provide bulk supply of water except where this function is to be privatized to the District and Town Councils Sanitation.
- ii) *Functions of SALWACO*  
Under the SALWACO Act of 2001, the Company shall develop and operate in every specified area, satisfactory water services at reasonable cost and on a self-supporting basis without adversely affecting the environment.
- iii) *Water resources management laws*
- Guma Valley Act 1961, which contains clauses dealing with water rights, pollution and catchment management.
  - The Water Supply and Control Act 1963, which has sections that deal with the same issues like water rights, pollution and catchment management.
  - The Forestry Regulations of 1990 which contains sections on catchment management.
  - The Environmental Protection Act of 2000 that contains sections on pollution and catchment management.
  - The SALWACO Act of 2001 that also contains sections on water rights, pollution and catchment management.

**5.1.4 Guidelines from Commitment to International Policies on Water (West Africa, African Region, Global)**

- i) *The Dublin Principles that state that water:-*
  - Is a finite and vulnerable resource required for socio-economic development and environmental management?
  - Must be managed in participatory manner and at lowest appropriate level.
  - Must be managed with women's involvement to be effective.
  - Is a social and economic good.
- ii) *Convention on the Law of the Non-Navigational Uses of International Watercourses.*
- iii) *The West African Conference on Integrated Water Resources Management.*
- iv) *The West African Water Vision.*
- v) *The African Water Vision.*
- vi) *The African Water Facility.*
- vii) *The Millennium Development Goals.*
- viii) *The Mano River Union*
- ix) *Etc.*

**5.2 Framework for Action**

Strategies shall be evolved to address emerging constraints that may impede performance in the sector. These strategies are:

- i) Planning and Implementation regarding what is to be done;
- ii) Institutions and actors regarding who is to do what;
- iv) Financing of planning and implementation
- v) Data and information on which to base decisions.
- vi) Laws and regulation regarding functions, powers and authority given to institutions
- vii) Capacity to do what is to be done; and
- viii) Monitoring and evaluation in respect of inputs, processes, outcomes and impacts in carrying out functions.

**5.2.1 Reform of Institutional Infrastructures**

In order to clarify roles, the institutional infrastructure will be reformed. The reform will be guided by the government policy of assigning and clarifying the roles of the various actors in the water sector at all levels. Following from this the institutional framework will be made up of those with:-

- Regulatory functions
- Service provision functions
- Information provision functions
- Consumer advocacy functions

In general, institutions in the regulatory and information provision category will remain in the public sector. On the other hand, institutions providing various goods and services, which are presently in the public sector will be made attractive for the private sector to become partners.

In addition, conditions will be created for the private sector to go it alone, whenever it feels the need.

### **5.2.2 Governance**

Within the institutional framework is to organize each institution in accordance with the following principles:-

- a) *Decentralisation and Devolution of Power:* To be effective each organization will be decentralized from the head office, provinces, the District Councils to the Chiefdoms/Towns/Villages.
- b) *Participation:* The citizenry will be appropriately represented in the governance of the organization. This will come from civil society organizations at the chiefdom town/village level.
- c) *Gender mainstreaming:* particularly as it affects the role of women in fetching, using water and disposing of water wastes.
- d) *Transparency and Accountability:* The operations of the organization at all the levels will be guided by the need to be transparent and accountable;
- e) *Sustainability:* The elements that contribute to sustainability (e.g. financial, economic, social, environmental, operation and maintenance) are addressed at all levels.

### **5.2.3 Planning and Implementation**

The implementation of the strategies to achieve the policy objectives will take cognizance of the guidelines. The strategies will require various actions that will have to be assigned to various institutions within the organization of the sector. An Action Plan will therefore be prepared to guide the implementation.

For water resources management, there will be target activities for planning and allocating the resources to meet various needs.

In the case of development, the infrastructure for provision of water and sanitation facilities will be based on various technologies. The technologies will be dictated by population size, site conditions, water availability, cost, cultural preferences, etc. More attention will be paid to what the communities can afford to contribute towards their realization and also O&M except in exceptional cases. The same will apply to sanitation that has depended on VIPs, slab toilets, drainage, garbage collection and disposal.

### **5.2.4 Financing**

Government will tap into the current traditional sources of funds-i.e. annual budget of the GOSL, and development partners. It is reasonable to expect that external assistance will be needed until the economy becomes strong enough for Sierra Leone to take full responsibility for financing her development projects. For water resources management,

self-financing will take quite a time to come and until then, will depend upon GOSL budgetary allocations.

For water and sanitation, financing will be for investment in infrastructure, operation, maintenance and capacity building. In the meantime, the question of cost sharing to invest in infrastructure, cost recovery and cost sharing in O&M will be carefully looked at in each case, particularly the urban system that fall under SALWACO's jurisdiction. In the rural areas and small towns, the "at cost" and community owned/managed policy laid down in the Local Government Community Development Act 2004 and the Letter of Sector Policy (April, 2004) with respect to drinking water supply and sanitation for rural communities and small towns will be followed. Similarly, the policies in the two documents with respect to urban water and sanitation will also be followed. Other sources of finance will be tapped, through various partnership arrangements with the private sector. Government will ensure that institutions are given the necessary human and material resources to work with.

#### ***5.2.5 Information***

The data and information position for planning and implementation will be vastly improved. This will be particularly so with regard to water resources, present coverage, state of infrastructure, consumer information, and other information needed for community participation. WATSANS will be involved in data collection at the community level.

#### ***5.2.6 Laws and Regulations***

The institutions in the sector will be established by law that will set out clear objectives, functions, powers, management and accountability arrangements. Those that have to enforce regulations in the management and use of water resources will be given appropriate legal powers, taking account of the conditions on the ground. The use of traditional management practices, where available and applicable, will be encouraged. Institutions which are not able to enforce regulations will be reviewed in order to make them capable.

#### ***5.2.7 Capacity Building***

Government will ensure that all institutions are equipped with trained manpower at all levels, and the financial and logistic support necessary to carry out their mandate efficiently and effectively. To this end the educational and technical institutions will be reformed to ensure that their programmes address the needs of the sector. Donors will therefore be encouraged to make provision in their financial assistance to the sector to include a portion for capacity building. In this regard considerable emphasis will be placed on WATSANS, pump attendants and water departments in the District Councils. Similar assistance will be sought and given to the WSD of the Ministry of Energy and Power, SALWACO, GVWC.

### **5.2.8 Monitoring and Evaluation**

In order to ensure that work is kept on target, various indicators will be selected (input, process, outcome and impact) about baseline values which will be monitored to ensure that intermediate targets are achieved. Benchmark values will be established and their indicators measured.

### **5.2.9 Standards and Standardization**

In the process of developing the water resources it will be necessary to adhere to various standards to protect human health and the ecosystem (particularly the aquatic system - the wetlands). In particular, drinking water standards will be adopted based on those of the WHO for drinking water until such time that national standards can be promulgated by the Standards Bureau of Sierra Leone, with the support of the Ministry of Health and Sanitation, GVWC and SALWACO.

In order to protect the flora and fauna in the wetlands, raw water quality standards that ensure their productivity and integrity will also be adopted.

In the area of water and sanitation infrastructures, it will be important for the purposes of operation and maintenance to develop standard designs covering such structures like hand dug wells, boreholes at various depths, hand pumps, spring boxes, gravity supply systems, storage tanks, rainfall harvesting, electro-mechanical equipment, distribution and supply networks, KVIP, squat/flush latrines, etc.

In order to facilitate planning and also to meet basic needs, the accepted per capita demand to meet them will be agreed and applied equitably for all in the country.

Again for the purposes of facilitating planning, implementation and monitoring, standard manuals will be updated or developed for the establishment of:-

- District Water Departments
- WATSAN Committees
- Operation and Maintenance
- Procedures for establishing water charges at community level and for determining tariffs for the urban supplies.
- Byelaws,.

### **5.2.10 Protection and sustainability of the environment**

The Government of Sierra Leone is committed to ensuring that the productivity and integrity (sustainability) of the environment are maintained. To this end it has passed the Environmental Protection Act – 2000. Bottlenecks and problems connected with the implementation of this Act to the water sector will be addressed for the protection and sustainability of both man and the environment.

## **6 POLICY GUIDELINES AND STRATEGIES FOR WATER RESOURCES MANAGEMENT**

### **6.1 Policy Objective**

The objective is to regulate the use of water and ensure that it is managed to meet the needs of socio-economic development (i.e. life, health, food, industry, energy, recreation, etc.) and the needs of the environment, (terrestrial and aquatic ecosystems) in a sustainable manner.

### **6.2 Challenges**

The challenges confronting overall management of water resources and in specific sectors are the following:-

#### **6.2.1 Overall water resources management**

The include:

- i) Developing an institutional framework that addresses fundamental human needs, ecosystems conservation and promotes local participation in the management of the water resources;
- ii) Developing comprehensive plans for the integrated management and efficient use of water resources;
- iii) Monitoring and carrying out an assessment of water resources availability (surface and groundwater) qualitatively and quantitatively;
- iv) Developing appropriate legal and regulatory frameworks;
- v) Encouraging capacity building efforts to make available the knowledge and the skills necessary to manage water resources at various levels; and
- vi) Strengthening basic and further professional training institutions in water management, or creating them, where necessary;

#### **6.2.2 Sectoral Challenges**

##### ***Drinking water and sanitation***

- i) Managing water resources and applying appropriate conservation technologies to meet demand in the dry seasons;
- ii) Increasing the participation of women in decision-making;
- iii) Mainstreaming gender in hygiene promotion;
- iv) Using technologies that take account of capital, operation and maintenance costs;
- v) Enforcing regulations and applying appropriate sanctions for violation of pollution laws;
- vi) Involving communities in determining tariffs;
- vii) Making tariff setting transparent

- viii) Improving knowledge about, and management of, water resources to meet the needs of other sectors and the environment.
- ix) Applying regulatory policies that allow private participation and eventually reduce dependence on donors
- x) Promoting public and private partnership
- xi) Re-inforcing the policy of government payment for water consumed
- xii) Charging fees for urban wastewater.
- xiii) Developing effective financial system
- xiv) Decentralizing regulatory bodies
- xv) Training professionals locally to be able to address national problems.

***Water and Agriculture***

- i) Providing an enabling environment for equal opportunity to access, control and participate in water resources management;
- ii) Formulating the right of women in decision-making regarding access, control and participation in water issues for food production;
- iii) Mainstream food security programmes in all ministries;
- iv) Managing the river catchments to reduce deforestation and its impacts.
- v) Building capacity to use water for irrigation of crops to increase food production;
- vi) Providing support for research in water resources management for food production; and
- vii) Supporting institutions providing credit for irrigation schemes to increase food production.

***Water and Energy***

- i) Undertaking planning studies and capacity building that involves beneficiaries;
- ii) Putting proper policies and legislative framework together to harmonize with existing policies;
- iii) Creating a Water Resources Council to manage the water resource to ensure its use for hydropower generation;
- iv) Promoting awareness about management of water resources among local communities;
- v) Drawing up environmental management plans for activities that adversely impact on water resources and also for hydropower projects which impact adversely on the environment.
- vi) Installing hydro-meteorological stations on main rivers and their tributaries, particularly near the location of identified future hydropower projects;
- vii) Establishing a hydro resource map of the country based on existing and new hydro-meteorological data;
- viii) Carrying out feasibility studies for identified future hydropower projects so as to select the best alternative (e.g. Yebin 1 and Yebin 2);

- ix) Updating the study on “Power Section Master Plan” for Sierra Leone carried out by Lahmeyer International in 1996.
- x) Determining the most appropriate hydro-generation expansion plan based on the above updated study.
- xi) Putting in place a more appropriate policy, legal and regulatory framework conducive to increased private sector participation in hydro-based electricity generation.
- xii) Devising and implementing innovative financing mechanisms for the development of micro/mini hydropower projects within the Rural Electrification Strategy and Plan.
- xiii) Revising NPA Act 1982 and enacting a new electricity law that provides incentives to private investors in the provision of hydro-based energy services to rural areas.

***Water and Environment***

- i) Eliminating water borne diseases.
- ii) Avoiding groundwater contamination.
- iii) Managing waste material disposal.
- iv) Reducing water flow downstream.
- v) Eliminating potential risk to aquatic ecosystem.
- vi) Reducing community dependence on external assistance for sophisticated systems.
- vii) Paying for water.
- viii) Ensuring proper land use.
- ix) Controlling pollution of water resources from social and economic activities.

**6.3 *Guidelines***

In addition to broad guidelines from Sierra Leone’s socio-economic reforms that have been stated in the previous paragraphs, the Dublin Principles will be applied in addressing the challenges.

In the case of international rivers, guidance will be sought from the Convention on the Law of the Non-Navigable Uses of International Water courses.

The Dublin Principles state that water:-

- Is a finite and vulnerable resource required for socio-economic development and environmental management.
- Must be managed in participatory manner and at lowest appropriate level.
- Must be managed with women’s involvement to be effective.
- Is a social and economic good.

## **6.4 Strategies**

To meet the challenges and achieve efficient management of the water resources of the country, the Government of Sierra Leone will:-

- i) Review existing laws on grant of water rights, pollution control, catchment management, and conflict resolution.
- ii) Establish a Water Resources Council to regulate and manage the utilization of the water resources for socio-economic development and sustainability of the environment at National, River basin, District, Community and International levels.
- iii) Create awareness about water resources management.
- iv) Prepare work programme to assess water resources of Sierra Leone, distribute a data acquisition and monitor programme. It will also embark on river basin planning; and prepare standards for raw water and effluence.
- v) Prepare regulations for allocation and grant of water rights for use of water, pollution control.
- vi) Conserve water resources and make it available all year round for drinking, commercial, industrial, energy, agricultural, navigation, tourism and recreation purposes.
- vii) Put in measures to cope with climate variability and change.
- viii) Put in measures to finance water resources management (hardware and software).
- ix) Encourage private participation in water resources management.
- x) Build capacity of stakeholders at different levels to participate in water resources management.
- xi) Institute mechanisms for collaboration and co-ordination in water resources management.
- xii) Carry out studies to begin dialogue aimed at regional integration through the use of shared water resources.

For the specific activities the GOSL will:-

### **6.4.1 At the national level**

Establish a Water Resources Council by taking the following actions:-

- i) Review existing laws on grant of water rights, pollution control, catchment management that are scattered and bring them under one enactment. The laws to be reviewed include:-
  - Guma Valley Act 1961, which contains clauses dealing with water rights, pollution and catchment management.
  - The Water Supply and Control Act 1963 that has sections dealing with the same issues like water rights, pollution and catchment management.
  - The Forestry Regulation of 1990 that contains sections on catchment management.
  - The Environmental Protection Act of 2000 that contains sections on pollution and catchment management.
  - The SALWACO Act of 2001 which also contains sections on

- Water Rights, Pollution and Catchment Management.
  - In the case of catchment management, provide in the legislation for the Water Resources Council that it shall carry out that function in collaboration with other agencies like the Environmental Protection Department, the Forestry Division, the City Town, District Councils, etc.
- ii) Enact legislation to set up the Water Resources Council  
The water resources shall be vested in the President on behalf and in trust for the people of Sierra Leone. The Council shall be responsible for the regulation and management of the utilization of water resources for socio-economic development and sustainability of the environment. The management will be organized at various levels namely: national, river basin, district, community and international levels.
- iii) Assign the following functions to the Water Resources Council:-
- Propose comprehensive plans for the utilization, conservation, development and improvement of water resources;
  - Initiate, control and co-ordinate activities connected with the development and utilization of water resources;
  - Make recommendations for the grant of water rights;
  - Collect, collate, store and disseminate data or information on water resources of Sierra Leone;
  - Monitor and evaluate programmes for the operation and maintenance of water resources projects; and
  - In collaboration with other agencies, manage the catchments to eliminate or abate depletion and degradation of water resources.
- iv) Include provisions in the enactment to cover:
- Composition of Council;
  - Terms of office of members, meetings, etc.;
  - Committees;
  - Secretariat of Council and Staff;
  - Special place of water for domestic purposes;
  - Water rights;
  - Pollution of Water Resources;
  - Funds for the Council and Accounts & Audit and Annual Report;
  - Powers, Penalties including powers to delegate functions;
  - Regulations; and
  - Transition Provisions.
- v) Prepare a programme of work including:-
- Creating awareness about water resources management
  - Carrying out a preliminary assessment of the surface and groundwater resources (quantitatively and qualitatively) on the basis of available data and information.
  - Reviewing and updating hydro meteorological and hydrological networks for the collection of data on the water resources of

Sierra Leone. Procure equipment, install and operationalize a data collection system. Initiate, revise or update hydrological data banks.

- Instituting a format for collecting hydrogeological data from hand dug well and borehole drilling operations.
- Preparing GIS databases on:
  - Biophysical data: topography, drainage, geology and soils; land use / land cover, hydrological data collection networks, etc.
  - Socio-economic data such as settlements with population; development projects including water supply and sanitation; irrigation, hydropower, transport, infrastructure, etc.
  - Administrative boundaries such as provincial, district and chiefdoms.
  - Cultural data such as historic sites, water falls, archeological sites, etc.
- Preparing preliminary comprehensive plans for each river basin showing the available groundwater and surface water resources potential, and the present and future water demand for domestic and industrial water needs, hydropower, navigation, environmental demands, etc.
- Preparing standards for the effluents from food processing, mining, textile industries, etc.
- Preparing standards for raw water quality to preserve the aquatic ecosystem. Preparing compliance and enforcement regulations.
- Preparing regulations to:-
  - Grant water abstraction rights;
  - Control pollution;
  - Manage river catchments in collaboration with other agencies e.g. through enforcement of Environmental Impact Assessment regulations and Forestry Law; and
  - Resolve conflicts.

#### **6.4.2 At the River Basin level**

- i) Set up a Board for each river basin. In each river basin, a number of Districts are located. The water resources will be managed within the basin, while Sectoral developments (social, economic and environment) are managed within the District administration.

The Board will consist of representatives of:-

- The District Councils that lie in the basin;
- Land and Water Development Division, Department of Environment.
- Representatives of Women's Organization.

- ii) Create a Secretariat for each River Basin Board. The Secretariat shall be headed by a person knowledgeable in water resources management. The Board will perform the following functions on behalf of the Council:-
- Make an assessment of available water resources quantitatively and qualitatively;
  - Make an assessment of the vulnerability of water resources in terms of variability in time and space, occurrence in extremes (floods and droughts), depletion and degradation.
  - Allocate the available water resources on the principles of social equity, economic efficiency, and environmental sustainability to meet:-
    - Human needs to preserve life and health and to reduce poverty.
    - Food production, livestock and fisheries needs to attain food security and improved nutrition.
    - Environmental needs especially critical ecosystems with reference to the Inland Valley Swamps.
    - Other socio-economic development needs such as hydropower, navigation, tourism, etc. The particular needs of the hydropower sites like Bumbuna will be catered for, on the basis of economic efficiency.
  - Conserve water resources and make it available all year round.
  - Put in measures to cope with climate variability and change.
  - Grant licenses and issue water rights for the damming, diversion or abstraction of water for various purposes (drinking water, irrigation, hydropower, tourism, etc.) The application will emanate from Watsan Committees/Boards, SALWACO, GVWC, individuals, private sector companies, etc.

#### **6.4.3 At the District Level**

Ensure that the District Planning Department which is responsible for development planning will submit the District development plans to the appropriate River Basin Boards in whose jurisdictions the Districts lie. These plans will cover sectors of water and sanitation, health, agriculture, energy, environment, education, roads, etc.

The River Basin Board will work out the water demand in respect of each sectoral development and present them to the River Basin Board(s) in which the District lies.

**6.4.4 At the Community Level**

- i) Ensure that Watsan Committees/Boards apply to the River Basin Boards in which they are located for license to dam, divert or abstract water first for drinking purposes and secondly for crop, animal and fisheries production.
- ii) Ensure that all members of the community are stakeholders and need to be involved in understanding and becoming aware of the issues of integrated water resources management about which the WATSAN Committees/Boards will act on their behalf. The participation of women will be ensured.
- iii) Sensitize and mobilize community members to be able to participate effectively. This will be done by trained people who will explain the issues to them. Women shall always be present at such fora. This function shall be performed by:-
  - The River Basin Board in whose jurisdiction the community lies.
  - The District Planning Committee or the District Water and Sanitation Department of the District in which the community lies.
  - NGOs and Civil Society groups who will be trained to carry the message of integrated water resources management to the community members
- iv) Information to assist the communities to participate and make informed decisions on the following:
  - a) Available water resources (ground and surface water) in quantity and quality :-
    - Distribution in space and time.
    - Vulnerability as a result of:-
      - Variability and change
      - Depletion and degradation
      - Extreme occurrence in floods and droughts.
    - Rising demand for drinking due to population growth;
    - Rising demand for agricultural production (crops, livestock, fisheries)
    - Environmental needs for wild life (terrestrial and aquatic) and fisheries.
    - Rising demand for other economic activities such as industrial, mining, energy, tourism, etc. needs.
  - b) The need to allocate and protect water resources and to cope with extremes, and conflicts.

#### **6.4.5 At the International level**

Protect the interest of Sierra Leone within all the four river basins (Little Scarcies, Great Scarcies, Moa and Mano) it shares with neighbouring Guinea and Liberia. As a down stream country, it could be adversely affected by water use in the upstream countries. The GOSL will ensure that the shared basins are managed for the mutual and equitable benefit of all. To this end, it will:

- Strengthen and meet its obligations under the Mano River Union;
- Carry out studies on development issues of concern and, thereafter, initiate dialogue with the government of the Republic of Guinea on the joint management of the other basins to meet the socio-economic development and environmental sustainability needs on an integrated and equitable basis.

#### **6.4.6 Finance Water Resources Management**

##### *Software*

The GOSL will be responsible for financing the WRC initially. To reduce the financial burden on government, the Council shall be kept small, but staffed with highly qualified key personnel.

In time the Commission will collect fees for issuing licenses for abstraction of water and also annual permits. Monies that will also be realized from fines for infringement of laws and regulations can be set aside for managing the resources.

At a later stage sufficient revenue may be collected from applications, license and water right fees, and fines that will be adequate to replace any GOSL budgetary allocation.

In granting water rights, the fees charged will take into consideration the social uses of water for life and health and the economic use of water in production.

##### *Hardware*

Financing of the hardware (i.e. physical infrastructure) for water resources management will be mobilized from appropriate internal and external sources in the public and private sectors. Such financing will have to take account of the social, economic and environmental uses of water. The financing targets of cost recovery, cost sharing, provision of subsidies to meet the basic needs of the poor, disabled and aged will be taken into account.

#### **6.4.7 Encourage Private Sector Participation**

With the rules and regulations on the grant of water rights in place, the stage will be set for the private sector either alone or in partnership with the public sector to obtain water rights to abstract, dam, or divert water resources for drinking, industrial, commercial, agricultural, hydropower,

navigation, tourism, recreational, and other purposes. Such uses will however be subject to the regulations regarding tariff levels, pollution control, environmental sustainability, etc.

#### **6.4.8 Build Capacity of all Stakeholders**

The GOSL will:-

i) Ensure that manpower needs are met. The sector will be organized such that at each level (National, Basin, District) there will be an organogram in which:-

- Roles and functions to be performed will be identified.
- The qualifications and experience required to hold positions will be defined.
- The numbers and level of (management, supervisory, and supporting staff) required to fill the positions will be determined.

The staff strength should be kept small but well trained and motivated. This is to reduce the recurrent budgetary requirements to run the Council and the River Basin Boards. The private sector will however be used to provide various goods and services needed by the Council and the subordinate organs.

ii) Ensure that manpower training is carried out. The needs of stakeholders at different levels to manage water will be assessed, and training programmes drawn up to fill the gaps. To be specific, the training will equip stakeholders to understand their roles and functions and how they can be carried out.

iii) Ensure that those to be trained are identified. Specifically, training will be offered to:-

- The members of the Water Resources Council and the staff of the Secretariat.
- The members of the various River Basin Boards and staff of their Secretariat.
- District Council WATSAN Department staff.
- WATSAN Committees/Boards in Chiefdom Councils.
- Staff of the District Departments of Forestry, Crops, Livestock, Fisheries, Land and water Development, Mining, Environment and Town Planning.
- Members of civil society groups who will become involved in water resources management.

☐

iv) Target appropriate categories of Trainees consisting of:

- Managers (profession & specialty (engineers))
- Supervisors
- Supporting staff

- v) Apply methods of training including:
  - Seminars
  - Workshops
  - Short duration courses
  - Medium duration
  - Long duration
- vi) Ensure that frequency of training will be determined by Departmental need.
  - vii) Make use of local and external training to be provided by: Staff of Council
    - Consultants
    - Technical Assistance
    - Colleges, Universities and Poly-techniques
  - viii) Provide logistics. Logistic support such as vehicles, office equipment, communication facilities, laboratories.
  - ix) Provide data and information needs. The acquisition of biophysical, socio-economic, cultural, political/ administrative data and the creation of databases in GIS format as previously mentioned.

In addition, decision support systems will be developed to aid in decision making for the management of the river catchments, mostly at the local level.

- x) Reform, restructure or strengthen education and training institutions as appropriate at the secondary and tertiary levels to offer relevant education and training in the various fields of water resources management.

#### **6.4.9 Collaboration and Co-ordination**

Integrated water resources management involves integrating social, economic and environmental factors that impact on human welfare and the sustainability of the environment. Various economic sectors and natural resource disciplines are involved. In the area of catchment management, the collaboration of the Departments of Lands, Forestry, Agriculture, Mining, Town Planning, and so on will be needed.

The GOSL will ensure that committees will be established at the national, basin and district council levels to ensure that these and other relevant departments collaborate and co-ordinate their activities towards the achievement of sustainable catchment management.

#### **6.4.10 Implementation, Monitoring and Evaluation**

The task of setting up the Council and operationalizing it will be guided by an Action Plan. The plan will deal with long term, medium term and

short-term activities. The long-term horizon is Vision 2025. The medium term will coincide with the Sierra Leone Poverty Reduction Strategies, which will be in phases of three years.

Milestones will be set to coincide with those Millennium Development Goals at 2005, 2010, 2015, 2020 and 2025 to enable international comparison. However, the three-year rolling Poverty Reduction Strategy Papers will also be used as milestones. Monitoring indicators will be established and their benchmark values determined/measured, and compared with values at subsequent milestones. The measurement of the indicators at various milestones will be arranged so that they provide reliable data for analysis. The indicators will be grouped into:

- Input indicators
- Process indicators
- Outcome indicators
- Impact indicators

Attention will be paid to the risks that could attend the implementation of any activity and therefore the likely outcomes and impacts.

## **7 POLICY GUIDELINES AND STRATEGIES IN THE OVERALL WATER SUPPLY AND SANITATION SECTOR**

### **7.1 Overview**

As already stated, despite its vast water resources, the country currently faces severe constraints in the availability of water for domestic and agricultural purposes in the dry season. The present national coverage of 22% for water supply does not compare so favourably with 35% achieved at the end of the IDWSSD in 1990. Table 3 shows the regional differences in coverage.

The low levels of coverage are responsible for the fact that many are prone to water-borne and water related diseases like malaria, cholera diarrhea and other diseases.

#### **7.1.1 Constraints to Drinking Water Supply**

The constraints in the sector according to the elements of the framework for action are as follows:-

*i) Water Resources*

Dry season shortages due to:-

- Inadequate storage;
- Depletion of water resources arising from deforestation;
- Absence of drilling capacity to access the deeper aquifers;
- Lack of biophysical data and information (e.g. hydro-meteorological) assess the available surface and groundwater resources;
- Inability to utilize other water conservation techniques such as rainfall harvesting;
- Loss of water in the water supply transmission and distribution system.
- Inability to plan to meet rising demand among other things to demographic shift in such places as Freetown and the provincial capitals;
- Inability to respond to climate variability and change.
- Inability to control pollution of rivers.

*ii) Infrastructure:-*

Rural

- Inadequate community sensitization;
- Many non-functional installed systems;
- Poor accessibility due, among others, to difficult terrain.
- Inadequate infrastructure due to inadequate finance and absorptive capacity;

- Inadequate maintenance due to lack of spare parts, funds and insufficient commitment on the part of some WATSANS and caretakers to perform their jobs;
- Inappropriate technologies
- Wrong attitude towards water as a natural right; and
- Inadequate sanitation infrastructure to maximize the benefits from providing safe drinking water.

*iii) Finance:-*

Rural

- Inability to raise capital to finance rehabilitation, expansion and construction of new systems.

Urban

- Lack of clear policy on capital cost & O&M cost sharing;
- Lack of mechanism for setting tariffs which ensures affordability and ability to pay;
- Inability to recover costs (O&M) from beneficiaries and from GOSL, ministries, departments and agencies for water consumed;
- Lack of consumer participation in setting tariffs;
- Corruption, misappropriation of funds;
- Lack of awareness of the need to make payment;
- Unwillingness to pay due to poor service;
- Inability to pay due to poverty;
- Recovery of O&M and Capital costs not being attained;
- Cost Sharing of Capital & O&M costs arrangements not being fulfilled;
- Overburdening of government finances; and
- Use of water to gain political favour.

*iv) Participation:-*

Rural

- Lack of harmony in project implementation, policies and standards.
- Inadequate participation of community leadership and members.
- Inability to recognize and cater for the special needs and role of gender (women, children, disabled and the aged).
- Lack of involvement in the choice of infrastructural technologies.
- Inadequate institutional framework for dialogues, awareness creation and sensitization.

Urban

- Over-centralization of water delivery systems

*v) Institutions:-*

Rural

- Lack of capacity to plan, co-ordinate and monitor implementation in the water supply and sanitation sub-sector;

- Over-concentration of organization at head office without sufficient representation at District level where real development activities take place; and
- Lack of clarity in ownership, management and over-concentration on the public sector institutions without involving the private sector.

Urban

- Lack of management of the water resources;
- Lack of co-ordination of the institutions in the water and sanitation sub-sector;
- Inability to enforce regulations such as pollution control and quality standards;
- Lack of clarity of the roles of GVWC, SALWACO and WSD as service providers and regulators; and
- Inability of the local councils in the urban centres to develop the capacity to manage garbage and excreta in a safe manner.

vi) *Information:*

Rural

- Insufficient data on coverage for planning.

Urban

- Inadequate data and information about water resource (surface and groundwater) for planning, operation and maintenance; and
- Insufficient data on consumers for setting up tariffs.

Rural & Urban

- Lack of proper co-ordination in information gathering, processing and dissemination.

vii) *Capacity Building:-*

Rural & Urban

- Lack of organizational, manpower, finance, technical, administrative and information capacity of the various institutions at central, provincial, district, chiefdom and town/village levels.

### **7.1.2 Recent Actions taken in the Drinking Water & Sanitation Sub-Sector**

#### *Urban Water Supply and Sanitation*

##### *i) Urban Water Supply*

Since the war ended, the World Bank has assisted GOSL with \$36 million credit to improve the water supply infrastructure in Freetown, by expanding the water supply production of the Guma Valley Water Company by 55%, repairing transmission and supply mains and installing meters. Through the credit the capacity of the Guma Works was increased from 17.7 mgd to 25 mgd between 2001 and 2004. This is not adequate to meet the expected demands of 38.1 mgd, 44.0 mgd and 58.9 mgd respectively in 2006, 2011 and 2016.

Presently, a 5-year credit of \$2.87 million (2005/2010) has been granted the GVWC to:

- Undertake reform studies in financing, management and business planning and to commercially orient the company;
- Undertake emergency works in the eastern parts of Freetown and meters installation to improve cost recovery of service delivery to low income communities; and
- Training and procurement of urgently needed equipment;

*ii) Urban Sanitation*

There has been an emergency clean up of the city of Freetown of illegal garbage dumps and choked drains and gutters.

A permanent solution where a Freetown Sanitation and Waste Management Company will be set up with appropriate executive, policy and legislative support to ensure that waste management system consisting of storage at or near point of generation, collection of waste, street cleaning and disposal of wastes on a sustainable basis to be established. An IDA credit of \$2.80 million has been earmarked for this.

*iii) Rural Water Supply and Sanitation*

For the period 2004-2010, a rural water supply and sanitation IDA grant of \$9.03 million has been secured to assist SALWACO undertake emergency rehabilitation and construction of water supply and sanitation facilities. The water supply will rely on gravity-fed systems to reduce O&M costs. These will cover rehabilitation of systems in four districts i.e. Bo, Kenema, Bombali and Tonkolili in the East, North and Southern provinces. A population of 1.75 million, 670,000 of who live in the villages.

The project will consist of:

- Civil works,
- Financing of project management consultancies,
- Implementation of sector policy reforms to attain sustainability.

Another consultant is also being engaged to be in charge of this project.

## **7.2 *Outstanding Issues/Constraints***

In spite of the above, there are many outstanding issues in the institutional, infrastructure, financing, information and capacity building fields that need to be addressed. These are dealt with in the following paragraphs.

### **7.3 Policy Objective**

The objective of providing drinking water and sanitation facilities is to improve health of the people and free them (especially women, children, disabled and the aged) from water-borne and water-related diseases and time spent in fetching water, so that they will be free to devote time to productive activities and to schooling.

#### **7.3.1 Policy Guidelines/Principles**

The Government of Sierra Leone will be guided by the following:-

##### *Rural Water Supply and Sanitation Guidelines*

- i) The development and strengthening capacity at local government level to undertake various development aspirations of the country. The local government institutions will take over the management, operation, and maintenance of water supply facilities within each locality. The Sierra Leone Water Company will devolve its responsibility and staff to the local government structures in a view to building and strengthening capacity at this level.
- ii) Adoption of a demand-response approach concept whereby communities choose service levels based on their perception and technology choice that will influence greatly ability/willingness to pay for their water supply and sanitation facilities;
- iii) An upfront contribution to capital costs and the full financing of operation and maintenance (O&M) costs by communities as a means to fostering ownership of the project;
- i) Implementation and management of rural water supply and sanitation schemes by communities with the assistance of local government, NGOs and the private sector;
- ii) Promotion of rural sanitation and improved hygiene practices through the use of participatory methods, appropriate involvement of district-level health staff and NGOs, and exploration of viable, low-cost technical options;
- iii) Commitment to the provision of counterpart contribution through its annual budgetary allocation to the Sierra Leone Water Company specifically for this project.

##### *Urban Water Supply and Sanitation Guidelines*

- i) A sound institutional arrangement and capacity building in management at Guma Valley Water Company (GVWC) will be pursued as some of the strong lessons learnt during the implementation of the urban water supply project funded by the IDA;
- ii) The Government of Sierra Leone has decided to establish a water and energy regulatory body that will periodically review issues in the sector to make it operate in a much more economic, efficient

- and satisfactory manner and in the best interest of the people of Sierra Leone;
- iii) Promotion of private sector participation and provision of urban water supply based on commercial principles;
  - iv) Cost recovery policies for rural services and tariff regime for urban process that could ensure efficiency and sustainability;
  - v) Reform SALWACO and GVWC to promote private sector participation including enabling private sector investment in GVWC and build up capacity in SALWACO to enable the institution to operate and manage water resources development for the sector respectively. To facilitate this directive, the government is committed to reforming the GVWC Act and set up a regulator for urban water sector by June 2005;
  - vi) Improving the management of the GVWC and strengthening staff capacity in financial management and business planning, enabling the implementation of commercial reforms in GVWC, by December 2006. These improvements will be undertaken as part of the implementation of the proposed Power and Water Project;
  - vii) SALWACO shall supply bulk water except where this function is to be privatized to the District and Town Councils Sanitation.
  - viii) SALWACO shall develop and operate in every specified area, satisfactory water services at reasonable cost and on a self-supporting basis without adversely affecting the environment.

#### **7.4 Strategies**

The GOSL will carry out the following activities:-

- i) Reform, restructure and strengthen institutional roles at various levels;
- ii) Ensure that water sources are managed sustainably using appropriate infrastructure as part of a National Water Supply and Sanitation Programme to increase coverage;
- iii) Mobilise finance for the implementation of the NWSSP on cost - sharing and cost-recovery basis as appropriate;
- iv) Ensure that data and information needed for the programme are made available to inform decision-making at various levels;
- v) Build institutional and staff capacities at various levels to effectively implement the programme and provide water and sanitation services on a sustainable basis; and
- vi) Monitor and evaluate the implementation of the programme.

##### **7.4.1 Institutional framework and roles**

On the basis of the roles assigned to public and private sectors and the decentralization under the national reform policy, participation in the water and sanitation sector will be organized as follows:-

*i) National Level*

A Unit will be created in the Ministry of Energy and Power to provide leadership in policymaking, planning, co-ordination, monitoring and evaluation. The Ministry of Health and Sanitation; Ministry of Finance; and the Ministry of Lands, Housing and Environment will assist it. It will be responsible for both rural and urban water supply and sanitation.

In collaboration with the Ministry of Development and Economic Planning and the Ministry of Finance the Unit will mobilize both internal and external financial support for the sector.

It will define basic services taking into account the size of rural population, size of small town population, urban population, per capita water demand, types of technology, number of people to be served with hand dug wells, drilled boreholes, gravity systems, conventional treatment plants (Degremont), KVIP, squat latrines, standard designs and specifications, quality of drinking water, etc.

A consultant has been engaged with IDA funding to set up the Unit.

*ii) District Level*

Water and Sanitation Departments will be created which will take-over co-coordinated planning for water supply and sanitation needs in the rural and urban areas under them. They will receive, direct and co-ordinate resources to the towns and villages under them, build capacity of beneficiaries to own and manage their water supply and sanitation facilities and also those of providers of services to the beneficiaries. The Department will be staffed by, among others, a Water Engineer, Community Development Expert and a Health and Hygiene Promoter. Overall, it will provide leadership on behalf of GOSL at the local level. It will ensure that water supply and sanitation delivery conform to approved policies and the National Water Supply and Sanitation Programme.

*iii) Local Level*

*a) Rural*

In the rural areas, the Communities will be assisted by the District Councils, SALWACO, the private sector and NGOs to participate in the national rural programme on the basis that they will make a demand for water and sanitation facilities, undertake to own and manage them, make an up front contribution to capital costs and be 100% responsible for operation and maintenance costs.

SALWACO will be structured in such a way that its regional organisation will provide technical and capacity building support to WATSAN Committees/Boards, WATSAN Departments in District Councils, Consultants and Contractors in the private sector and NGOs. This support will include sensitization and community mobilization, planning and implementation of water supply and sanitation facilities. This support will either be directly or indirectly through the District Water Supply and Sanitation Departments when they are set up.

NGOs, private sector organizations, and District Council staff, can also provide the same support once they have received previous training in the use of participatory planning and implementation procedures approved under this policy.

*b) Urban Areas outside Freetown*

In response to the Local Government Act 2004, SALWACO will assist the GOSL to prepare modalities by which the Urban Division of SALWACO will hand over the urban systems presently under it to the relevant local authorities (i.e. Town Councils). The consequential change of ownership and management structures and for operation and maintenance will be addressed. The possible roles that SALWACO could play with respect to rehabilitation, expansion, construction of new systems and operation and maintenance, tariffs, cost recovery and their sustainability will be discussed and agreed with the local authorities (i.e. District and Town Councils). The modalities will also make provision for private sector investment, operation and maintenance and management under various public and private sector partnerships.

SALWACO will offer training in operation and maintenance for staff of local authorities to take over this function.

*c) Urban Water Supply and Sanitation - Freetown*

i) GVWC will be reformed to:-

- o Permit private sector shareholding in the ownership structure.
- o Create opportunities for the private sector to:
  - Purchase bulk water from GVWC, distribute and sell in agreed areas of Freetown.
  - Be able to produce, distribute and sell water in agreed areas of Freetown
- o Transfer water resources management to the proposed Water Resources Council.
- o Make it obligatory for GVWC to submit its tariff requests to a public utilities regulatory body.
- o Strengthen the company in business and financial management.

ii) The City Council will set up a company to manage excreta and garbage collection and disposal as a business venture.

*iv) Regulation*

Urban water tariff will be regulated by establishing a utilities regulatory body that will be responsible, among other things, to regulate tariffs proposed by the GVWC, and SALWACO/Town/ District Council water supply companies. The body will have the usual requirements of Board, Functions, Programmes, Powers, Finance, Regulations, etc.

Drinking water quality standards will be established by the Sierra Leone Standards Bureau with the assistance of GVWC, SALWACO, and the Ministry of Health and Sanitation. A mechanism for monitoring by the Ministry of Health and Sanitation will be established.

, The Water Resources Council will regulate the use of water resources with the collaboration and co-operation of the Forestry Division, Crops Division, Lands and Water Development Division of the Ministry of Agriculture, Forestry and Food Security and the Environment Division of the Ministry of Lands, Country Planning and Environment.

*v) Co-ordination and Collaboration*

At the policy level, the Ministry of Energy and Power will take the leadership to set up co-coordinating forum where it will meet regularly with the Ministries of Health and Sanitation, Education and Agriculture, SALWACO, GVWC, NGOs/Donors, Consumer Associations and Private Sector, etc., to review progress and take corrective measures where necessary.

A similar forum will be established at the District level. Its composition, functions and mode of operation will be part of this policy. Lessons learnt from the present Technical Committee on Water and Sanitation will be taken into account.

#### **7.4.2 National Water and Sanitation Programme and its Implementation**

Considerable progress was made after independence and during the IDWSSD (1981-1990) to install various water supply and sanitation facilities. At the beginning of the decade, the national coverages were 2% and 1% for water and sanitation respectively. By the end of 1990, 35% and 5% coverage had been achieved for water supply and sanitation respectively. However, due to lack of maintenance, inadequate finance (capital and cost recovery) and vandalism during the war, the coverage fell to 15% and 5% respectively. As a result of strategies put in place during the period of the National Recovery Strategy (2000-2003) with assistance from the World Bank and other development partners, the coverage has presently improved to 22% and 15% respectively.

To meet the target of 100% coverage for water supply and sanitation as targeted under Vision 2025, SALWACO has prepared a preliminary national water and sanitation programme up to 2025. The objectives, principles, comments, etc. of the programme are described briefly below.

The programme objectives are to:

- Increase access of rural populations to safe and sustainable water and sanitation facilities;
- Improve health and living standard of the rural population; and

- Contribute to the achievement of the national target of 85% for water supply and sanitation coverage by the year 2015 and 100% by 2025. At the end, some 3.9 and 4.2 million people will be provided with water supply and sanitation facilities respectively.

The programme is designed on the following principles, among others:

- Communities' expression of interest in the programme to SALWACO in the absence of District Councils at the moment;
- Community ownership and management of the delivered facilities; and
- Backyard Private sector firms' delivery of goods, services and works.

The Programme will integrate water, sanitation and hygiene promotion activities and build upon the capacity of participating stakeholders to sustain the structures and systems delivered.

The main components of the Programme are:-

- Infrastructure;
- Community development;
- Capacity building and training, and
- Project Management and Technical Assistance.

The infrastructure will involve:

- 22,000 boreholes and (open diameter) hand dug wells with hand pumps;
- 42 piped-borne water supply systems;
- 22 water catchments basins improved gravity water supply systems.
- 45,000 household and institutional VIP latrines.

The cost of the preliminary programme has been estimated on assumptions regarding basic services, population sizes, ground conditions, etc. which may differ when the policies on these are finalized.

However, since 2003 UNICEF has been carrying out a detailed survey of the actual conditions on the ground to find out numbers of villages/towns, population with water and sanitation facilities, their conditions, etc. The work has been completed for Kailahun and Kambia Districts. These are yielding valuable data that will be of tremendous help in more accurate planning and estimation of cost.

Consequently the GOSL will:-

- Adhere to the National Water and Sanitation Programme as prepared by SALWACO and described above. It will be updated on the basis of the survey by UNICEF and the 2004 National Population and Housing Census of December 2004;
- Prepare a similar programme to cover Freetown with the assistance of GVWC; and

- Assist the rural communities to select water supply and sanitation systems, whose technology they can afford to contribute to its capital cost and also the cost of operation and maintenance as required by the Community Ownership and Management (COM) concept. This will contribute to the sustainability of the systems.

#### **7.4.3 Financing of National Water and Sanitation Programme**

Over the years, GOSL has made insufficient investment in water supply and sanitation facilities. Current estimates put it at about 2% of GDP. Investment in the field has been dominated by NGOs and Donors. Their financing approaches have been varied. Most have not requested financial contribution for installation of infrastructure. Neither have they insisted on contribution for maintenance of systems.

For the few that have asked for capital contribution and also payments towards O&M, (e.g. Bo-Pujehun project) less break down and abandonment of systems have been experienced. In the urban towns lack of awareness of the need to pay and also unwillingness and inability to pay has contributed to system breakdowns. The situation in Freetown under the GVWC has been better even though a lot remains to be done. For the NGOs in the rural areas there is wide variation in the cost of the facilities provided.

Since 1998, systems in the urban towns under SALWACO have been undergoing rehabilitation. Unfortunately, revenue based on current tariff levels has been inadequate to recover costs because of poverty and lack of involvement in fixing the tariffs. Further, the GOSL's promise to subsidise O&M costs has not been kept.

To move from the present 22% and 15% coverage for water supply and sanitation respectively, to 85% in 2015 and 100% in 2025, the present National Water and Sanitation Programme is preliminarily estimated to cost \$80m by 2015 and \$180m by 2025.

The funding anticipated by 2009 is \$24 m. These are commitments from the GOSL, the IDB, IDA and others. There is therefore a funding gap of \$56.0 m and \$156m by year 2015 and 2025 respectively to attain the MDGs.

#### *Policy Objective*

The policy objective is to mobilize adequate funds internally and externally to meet the investment cost to rehabilitate and expand existing infrastructure, new infrastructure and the O&MR costs to achieve 100% coverage of both water supply and sanitation by 2025.

*Policy Guidelines*

For the villages and small towns, GOSL will share cost of investment while 100% of O&M costs will be borne by them. This will be in accordance with the COM concept.

For the urban towns under SALWACO and Freetown under GVWC, costs will be recovered in accordance with the financial provisions in the Acts setting them up.

*Strategies*

*Rural and Small Towns Water Supply and Sanitation*

The COM concept will be elaborated to take care of:

- a) Capital Investment: This will be on cost sharing basis with GOSL, Donors and NGOs.
- b) Operation and Maintenance: This will be borne fully by the beneficiaries.

*Urban Towns under SALWACO:-*

- a) Awareness will be created among beneficiaries on the need to pay for water and sanitation services;
- b) For each town system a management committee will be set up, (composed of representatives of key stakeholders including women and the poor and vulnerable) to approve cost recovery tariffs bearing in mind the ability to pay;
- c) Agree that tariff will be based on metered consumption; and
- d) To reduce the burden, cost recovery will be approached in stages:-
  - Stage 1: 100% operation & maintenance cost
  - Stage 2: 100% O&M cost + Replacement cost
  - Stage 3: 100% O&M + Replacement + Capital cost

*Freetown under GVWC*

- i) Increase campaign to create awareness to pay for water and sanitation services;
- ii) Replace water bills based on rateable values to bills based on metered consumption;
- iii) Procure enough meters and install;
- iv) Update consumer data; and
- v) Determine cost recovery tariff with involvement of representatives of consumers.

*Mobilization of investment Funds*

Funds will be mobilized from:

- i) GOSL
- ii) Private Sector
- iii) Consumers
- iv) Long term funds from:
  - Insurance companies, Pension funds, Social Security Funds, Stock market, Municipal bonds, etc.

- v) Donors
  - Grants for rural communities, small towns and for the urban poor.
  - Funds from HIPC sources, African Water Facility, etc.
  - Concessionary loans from Donors.

#### **7.4.4 Data and Information**

Various types of data, biophysical, socio-economic, administrative/political data are needed for the planning and operation of water supply and sanitation systems in the rural and urban areas.

In the component dealing with water resources management, it has been proposed to acquire and present biophysical, socio-economic, administration/political and cultural data in GIS format. However, for water supply and sanitation, other data and information will be needed.

##### *Policy Objective*

The objective is to identify other socio-economic data that must be compiled in databases to enhance the planning and management of water supply and sanitation systems.

##### *Policy Guidelines*

It is government policy that the planning and implementation of policies and programmes should be based on sound data and information.

##### *Strategy*

- i) Site specific information about water supply and sanitation systems will be identified, especially regarding:
  - Location of system
  - Types of system
  - Source information
    - Hydrogeological, BH Depth, Aquifer, SWL, DWL, Yield, Water Quality, (pH, Colour, Salinity, chemical determinants, coliform, etc.)
    - Ownership
    - Year of installation
    - Collaborating NGOs
    - Number and type of people served
    - Demand (domestic, commercial, industrial, etc.)
  - Customer information
    - Location
    - Metered/Not Metered
    - Name
    - Domestic, commercial, industrial

- ii) The data will be presented in GIS format and made available to all who have legitimate use for them.
- iii) Study and research needs will be identified and:
  - Proposals for them prepared
  - Cost estimates prepared
  - Funds mobilized
  - The studies and research will be assigned to appropriate bodies.

#### **7.4.5 Capacity Building**

Before the war, Sierra Leone had a fairly well trained staff as well as experienced public and private sector employees. The devastation caused by the war resulted in a lot of people with knowledge and experience leaving their posts, and or leaving the country to seek refuge or greener pastures outside. Also as reported earlier, infrastructure and logistics were destroyed and or broken, leaving many public and private enterprises poorly staffed and equipped.

With the economy badly run-down the challenge will be to recruit experienced hands or fairly younger hands and train them to fill the positions required of them in the various parts of the public sector with attractive conditions of service. This is true of the water and sanitation sector.

##### *Policy Objective*

The objective is to develop manpower resources to be able to implement the national water and sanitation program at all levels.

##### *Strategies*

Under the Institutional component of the framework for action, the following strategies will be adopted:

- i) The organizational structures of institutions will be reviewed and restructured so that it meets governments guidelines on decentralization and devolution of power to the grassroots:
- ii) An organizational audit will be carried out to ascertain that the structures at the various levels (Head Office, Provincial District, Chiefdom, Town/Village level) have:
  - Job descriptions
  - Job requirements
  - Performance evaluation
  - Requisite number of management, supervisory, and support staff categories.
  - Women adequately represented.
- iii) A Training Needs Assessment to identify knowledge and skills gaps that current staff need to fill to perform their functions efficiently will be carried out.
- iv) Training programmes to fill the gaps will be drawn up.
- v) Providers of training in the various areas will be identified.

- vi) Estimates of the cost of training to fill the gaps will be prepared.
- vii) Funds will be mobilized from various sources.
- viii) The training programme will be implemented.

#### **7.4.6 Monitoring and Evaluation**

Monitoring and evaluation of performance in implementing various policies were lost during the war but it was brought back when the National Recovery Strategy was designed and implemented. After two years, performance was evaluated and the achievements, shortcomings and reasons were identified. At least it gave the GOSL a more realistic time to move from the IPRSP, NRS and the preparation of the PRS – 2004/2006.

##### *Policy Objective*

The objective is to set up a monitoring system within each component of the policy framework so that short, medium and long term monitoring can be undertaken to guide the implementation of the policy.

##### *Strategy*

For each component:

- i) Performance indicators will be identified and grouped into:-
  - Input indicators
  - Process indicators
  - Output indicators
  - Impact indicators
- ii) Baseline values for each indicator will be established or measured.
- iii) The values will be measured at 2005, 2010, 2015, 2020, and 2025.
- iv) The data at each milestone will be used to evaluate and take corrective measures to refocus on goals and vision.

## **8 POLICY GUIDELINES AND STRATEGIES FOR RURAL WATER SUPPLY AND SANITATION PROGRAMME**

### **Overview**

The preceding paragraphs described the guidelines and strategies for implementing the overall national water and sanitation programme for rural and urban areas. This section is devoted specifically to guidelines for the rural areas (i.e. villages and small towns).

As already stated, the NWSSP aims to achieve 100% coverage water supply and sanitation by 2025. The estimated coverage by 2015 is expected to be 85% and is expected to cost \$80 million. The funding committed by 2009 is \$24 million from the GOSL and donors. There is therefore a funding gap of \$56 million and \$156 million for 2015 and 2025 respectively.

It is estimated that under the investment 3.9 million and 4.2 million people will have access to water supply and sanitation facilities respectively: It will involve:

- 22,000 HDWs and boreholes fitted with hand pumps;
- 42 piped water supply systems
- 22 improved gravity water supply systems
- 45,000 household and institutional latrines

The programme will integrate water, sanitation and hygiene promotion and will consist of:

- Infrastructure
- Community development
- Capacity building and training
- Project management and technical assistance

To participate in the programme, communities will have to express an interest to SALWACO in the absence of District Councils and must accept to manage the facilities to be delivered. The programme has been drawn up based on planning criteria and field conditions that are yet to be checked and agreed upon.

UNICEF has, since 2003, undertaken a detailed survey of field conditions in selected Districts to obtain data about number of villages, their population, access to and condition of water and sanitation facilities. If this survey is carried out for the remaining districts, a very reliable basis would be available to estimate the size and cost of the programme.

### **Challenges**

In view of inadequate funding of the sector, the Water Supply Division of the MEP could not take the lead to increase coverage. The NGOs and donors therefore became dominant in increasing coverage.

In the meantime, water and sanitation delivery has been characterized by norms, practices and lessons learnt during the IDWSSD.

NGOs and donors especially have had direct access to the communities (villages & towns) with or without the knowledge of Government ministries and departments in Freetown or the District administrations.

The participatory approaches which they practice vary and so are definitions of basic services, technology choice, cost of infrastructure, operation and maintenance, etc. There has been lack of co-operation and lack of information about these participatory and planning approaches with the result that adjacent communities have their facilities delivered to them under different conditions. To make efficient use of limited resources, the GOSL has decided to issue this policy document to guide all the actors in the sector.

The rural areas contain about 70% of the population of Sierra Leone. They consist of many scattered settlements in the chiefdoms of the thirteen Districts of the country. For this policy, the rural areas are defined as villages and small towns in the following ranges:-

- 75 - 3000 - village
- 3001 - 15000 - small town

#### *Objective of the rural component of the National Water Supply and Sanitation Programme*

The overall objective is to improve health by freeing the citizens from water borne and related diseases so that they will be healthy, productive and lead a satisfying life. The specific objectives are:

- To provide basic water and sanitation services for communities that will contribute towards capital cost and ensure payment for normal operation, maintenance and repair costs of their facilities, mindful of the need to ensure affordability, equity and fairness for the poor and vulnerable;
- To ensure sustainability through effective community ownership and management (COM) of facilities, active participation of women, public sector facilitation and private sector provision of goods and services; and
- To maximize health benefits through integration of water, sanitation and hygiene education interventions.

#### **Strategies**

Each rural community through will achieve the above objectives:

- i) Constituting itself to operate within the institutional roles defined by GOSL;
- ii) Participating in Planning and Implementation;
- iii) Financing part of the capital cost and assuming full responsibility for O&M costs;
- iv) Operating and maintaining the facilities; and
- v) Monitoring activities to ensure sustainability of the systems.

## **8.1 Guidelines for participation and institutional roles**

According to the GOSL guidelines, the NWSSP will be anchored at the community level and supported by the District Council (DCs). DCs will create the enabling environment for communities to own and manage their water supply and sanitation facilities. The DCs will also assist in ensuring recognition of community based WATSANS, which, in this document, are Committees for villages and Boards for small towns. The WATSANS will function as autonomous and accountable entities.

The DCs will be institutions through which the GOSL annual budgetary allocations for water and sanitation delivery will be channeled. The Donors and NGOs who in the past have entered communities directly with or without the knowledge of Government will now be required to channel their assistance through the District Councils, who will direct them to communities in chiefdoms where assistance has been requested. Other public and private sector institutions will facilitate the process.

As the participation practices that were learnt during the time of the IDWSSD have persisted till today, there is some commitment in some rural communities to take some responsibility for their water supply and sanitation services. Communities got into the programme either officially through the limited funding that the GOSL provided in its annual budget for the sector or through the intervention of a “native son” with an NGO or Donor to help his/her village or town. It could also have been at the initiative of a local or external NGO who had included the village or town for whatever reasons in its programme of assistance to the poor. Water and sanitation facilities were provided either as an end in themselves to improve health, or as an integral part to promote community self-help in agriculture or cottage industry.

There are still problems in spite of the progress made. Many communities are yet to appreciate that the decision to participate is theirs and that considerable responsibility rests on them to make the systems sustainable. Even now, many villages supplied with water and sanitation facilities look to the NGO/Donor that was instrumental in financing the installations whenever there is a breakdown. There was no requirement that communities expressly ask to be assisted to procure water supply and sanitation facilities.

Following from the guidelines, the institutional roles for rural water supply and sanitation delivery are presented in Fig.1.

### **8.1.1 Role at the Village or Small Town Community**

The village or small town community is made up of traditional leaders, farmers, food sellers, native drink manufactures and sellers, bakers,

fitters, blacksmiths workers groups, religious groups, youth groups (footballers), schools, clinics/ hospitals, commercial and industrial concerns, general community, etc. They will have to appoint a WATSAN Committee in the case of a village or WATSAN Board in the case of a small town to lead them in carrying out the responsibilities expected of the community arising out of their free choice to participate in the programme. A draft generic guideline for establishing a WATSAN Committee/Board is presented in Appendix 1.

*Responsibilities of WATSAN Committee/ WATSAN Board*

The following responsibilities could be given to an existing group or, in lieu of that, a new WATSAN Committee/Board.

- i) Initiate demand;
- ii) Apply to the District Council to obtain a grant and planning assistance;
- iii) Plan their water supply, deciding on type of system and its management;
- iv) Meet pre-project contractual obligations (organizational and financial);
- v) Meet construction agreements (e.g. site preparation and labour);
- vi) Participate in health education training;
- vii) Improve environmental sanitation, including construction of household and community latrines, if affordable;
- viii) Monitor, supervise, evaluate and certify installations;
- ix) Operate and manage maintenance of handpumps;
- x) Collect and save water fund, keep records of accounts and decisions;
- xi) Repair pump or hire private mechanics;
- xii) For small piped systems, contract SALWACO or relevant agency to operate, maintain and/or collect revenues; and
- xiii) Be responsible for expansion and eventual replacement of installations.

### **8.1.2 Role of District Councils**

A Water and Sanitation Department will be established to make sure that the GOSL policies on water and sanitation, as developed by the Ministry of Energy and Power, are implemented.

The Department must have skills in community awareness creation (ie through animation and folk drama), training, water supply, sanitation and hygiene education. It will report to the District Chief Administrator.

The Department will make every effort to get assistance from SALWACO Rural Water Division, the private sector and NGOs to build capacity to carry out its functions.

The functions of the Department would include:

- i) Plan and monitor district water and sanitation programme;
- ii) Prepare annual workplan and budget for water and sanitation and update priority listings for new facilities to be adopted by the District;
- iii) Keep records of service coverage;
- iv) Assist community with needs assessment;
- v) Assist community to plan its water supply systems;
- vi) Assist with formation of water committees/boards;
- vii) Train water committees/boards
- viii) Collect and save water and sanitation revenue, record keeping and pump repair;
- ix) Promote good health practices and latrinization;
- x) Provide continuing support to communities;
- xi) Provide information to community on technology, choice and design;
- xii) Train private mechanics;
- xiii) Co-ordinate training of contractors (wells, latrines ...);
- xiv) Assist in social and technical surveys;
- xv) Co-ordinate training of latrine artisans; and
- xvi) Train community health workers;

Presently, the District structures under the Local Government Act are being set up. It will therefore take some time to set up the proposed Water & Sanitation Departments under them.

### ***8.1.3 The Ministry of Energy and Power***

The Ministry is establishing a Water Unit that will be responsible for broad sector policy formulation planning and co-ordination; monitoring and evaluation of the activities of the actors in the sector, including the Ministry of Health and Sanitation, SALWACO, the Private Sector, Beneficiaries, Donors and NGOs. It will also assist to mobilize funds and other resources for the water and sanitation. Its policies will be channeled through the District Councils for the guidance of communities and the organizations that support the communities in the effort to increase coverage in the villages and small towns in the chiefdoms under the Councils. The Ministry shall:

- a) Set policies and plan NWSSP;
- b) Prepare annual programme and budget;
- c) Monitor and evaluate progress of NWSSP;
- d) Update national RWSS plan and policies periodically;
- e) Set national standards, specifications and guidance,
- f) Conduct limited applied research;
- g) Maintain water resources and water supply planning base.
- h) Design, prepare contract documents and inspect small piped water supply systems;
- i) Supervise NWSS programme;

- j) Mobilize national and international funding and support;
- k) Administer and channel funds;
- l) Assess and approve projects;
- m) Co-ordinate with other ministries; and
- n) Co-ordinate with NGOs and ESAs.

#### ***8.1.4 Guidelines for co-ordination and collaboration***

The objective is to conserve resources and develop a common approach that is cost effective in the implementation of the NWSSP.

There are many actors in the field particularly at the community level. They enter the area of water and sanitation for various reasons. Their approach to doing things is therefore different and leads to overlaps and uneconomical use of resources. It is necessary to create a forum whereby all can discuss and help in policy formulation to smoothen implementation of the national programme.

##### *i) National Level co-ordination and collaboration*

To ensure effective co-ordination and collaboration at the national level between ministries and agencies involved in community water supply and sanitation, a National Water and Sanitation Collaborative Forum shall be put in place to meet regularly to discuss the direction and impact of the NWSSP, in the context of the various institutional roles. Co-ordination will also be promoted at the regional, district and community levels to ensure effective delivery of services, accountability and sustainability. The Forum shall consist of representatives from:

- i) Ministry of Energy and Power (MEP);
- ii) Ministry of Local Government;
- iii) Ministry of Health and Sanitation;
- iv) Ministry of Education (MOE);
- v) Ministry of Finance;
- vi) Ministry of Social Welfare and Gender Affairs;
- vii) Ministry of Lands, Housing and Environment;
- viii) Sierra Leone Water Company (SALWACO);
- ix) Guma Valley Water Company (GVWC);
- x) Water Resources Council;
- xi) Development Partners;
- xii) NGOs;
- xiii) WATSAN Committees and Boards;
- xiv) Private Operators; and
- xv) Local Private Consultants.

The functions of the Forum shall include the following:

- (a) Defining national parameters for achieving impacts of water and sanitation interventions;

- (b) Co-coordinating activities of all actors with a direct and indirect role in water and sanitation delivery; and
- (c) Establishing clear indicators for measuring outcomes of water and sanitation interventions.

*ii) District level co-ordination and collaboration*

The strategy at this level would be to continue to strengthen the community structures and build accountability mechanisms that would drive efficient and effective performance. DWSDs shall regularly brief the Council, preferably quarterly, on the water and sanitation situation in the district. DCs shall collaborate with NGOs that work within these districts to ensure that their practices are in conformity with the national policy and guidelines of the NWSSP. This could be effectively achieved through the establishment of steering committees, with membership from the DC, the various NGOs and communities. Development partners working at that level may also participate in the work of the steering committee.

The following reports shall be sent regularly to the DCs/DWSDs by various structures and organizations working within the water and sanitation sector in every district. The DCs/DWSDs shall be expected to acknowledge receipt and act on these reports:

- Monthly reports on operation and maintenance, including water quality monitoring reports;
- Annual Reports (including financial statements);
- Report on Community Forums to discuss operations

*iii) Community level co-ordination and collaboration*

The strategy at this level is to ensure adequate information flow between the water user groups WATSAN Committees and Boards and the community, and between the Committees and Boards and DC to ensure transparency, accountability and effective delivery of services. The Committees/Boards shall hold regular forums with the community (at least 2 times in a year) to report on their stewardship and get feedback from the community. The Forum shall address issues including:

- Operations (including reporting on revenues and their application);
- Water tariffs;
- Sanitation and hygiene; and
- Water resource management and protection.

Communities will be assisted, on a regular basis, to undertake their roles in:

- Monitoring and evaluating the operation of water and sanitation facilities
- Financial and assets management
- Collecting, storing and disseminating information for the benefit of the DC and the community.

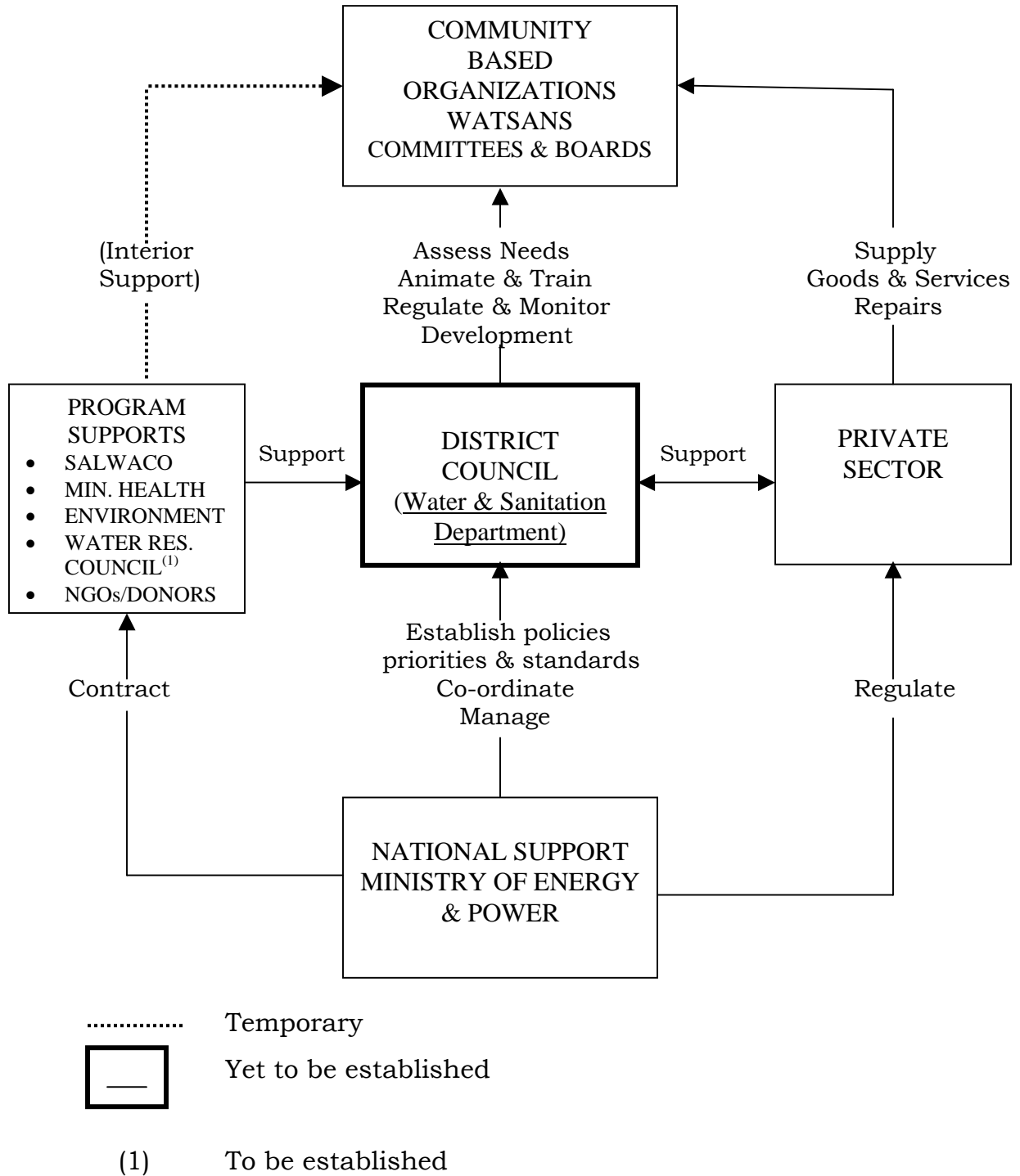


FIG. 1: INSTITUTIONAL ARRANGEMENT AT THE DISTRICT LEVEL

#### **8.1.5. Guidelines for Role of SALWACO (Rural Water Supply Division)**

As indicated earlier the District organization structures are being set up. It is therefore anticipated that it will take some time to set up the District Water & Sanitation Departments (DWSD). In the meantime, SALWACO is expected to carry out the functions of the DWSDs. When the DWSDs are in place, SALWACO will limit itself to providing only training and technical support to community WATSAN Committees and Boards.

The SALWACO will be organized at National and Regional levels. It will have the following responsibilities at the various levels.

##### *At the national level*

- National water supply and sanitation policy;
- Budgeting and annual workplans approval;
- Standards and specifications setting and enforcement;
- Programme management and administration;
- Financial management, controls and audit;
- Regional and district programme support;
- Training and applied research programme development;
- Training of regional trainers;
- Monitoring and evaluation;
- MIS;
- Rural water resources database; and
- Inter-agency liaison (including ESAs).

The SALWACO Division at headquarters would be designed to provide support to the programme at regional and district levels and thereby be restricted in size and not have any executing capacity itself.

##### *At the regional level*

From this level SALWACO will provide assistance to the District Councils under it. The regional organization shall consist of Administration, Programme Management, Training and Technical Units. The responsibility of the regional organizations will be to:-

- a) Plan and supervise regional RWSS programme;
- b) Co-ordinate district and regional authorities;
- c) Approve disbursement and contract payments;
- d) Keep inventory of communities and RWSS facilities;
- e) Track programme activities and progress;
- f) Prepare annual programme and budget;
- g) Monitor and evaluate progress and condition of systems;
- h) Package contracts for wells;
- i) Supervise and certify installations;
- j) Responsible for financial management;
- k) Disburse operational expenditure;

- l) Supervise and train extension agents;
- m) Assist extension agents to introduce project to communities and resolve problems;
- n) Adapt training materials for use locally;
- o) Train artisans/contractors in latrine construction, and plan and implement latrine promotion campaign;
- p) Site survey;
- q) Inspect construction;
- r) Train local contractors to construct hand dug wells;
- s) Prepare bidding documents inspect well construction and approve payments to contractors;
- t) Train private mechanics and extension agents; and
- u) Inspect new water supply facilities.

SALWACO will only be involved if a small town requests that SALWACO carries the development and the operation and maintenance of water supply facilities.

#### **8.1.6. Guidelines for role of development partners, NGOs and Civil Society**

GOSL recognizes the invaluable role that the Donors and NGOs have played in supporting WATSAN in the country. The Government would like them to play similar role but within an approved policy and programme.

The following are the three ways by which NGO resources can be drawn upon in support of the programme:-

- i) As a training resource under contract to SALWACO working in tandem with national training institutions. Water Aid is particularly well suited having worked in a training and capacity building role with numerous local NGOs. Its training could be expanded to train trainers within SALWACO at the regional levels.
- ii) As implementing agencies working directly with communities under contract to SALWACO DWSSDs within the district development planning framework. As such they would receive training (as necessary) through SALWACO and function in a parallel role to that of the District Councils. This *modus operandi* is particularly relevant in that it would:-
  - Encourage compatibility in policy and programming between NGOs and government programmes;
  - Utilize otherwise scarce available institutional resources in support of the government programme; and
  - Provide for a plurality of options and approaches.
- iii) As support agents to District Councils in strengthening and implementing components of their district water program. Strengthening would include training in technology, and community involvement and capacity building. Implementation

would include acting on behalf of the District Council in support of selected community projects.

More specifically the Donors/NGOs would be encouraged to:-

- a) Provide funding support;
- b) Provide capacity-building for actors at the national, district and community level;
- c) Share their collective experiences in community water and sanitation delivery from other regions that may be relevant to the country;
- d) Act within the guidelines of the national programme;
- e) Support advocacy activities for mainstreaming water and sanitation in the national development agenda.

#### **8.1.7. Guidelines for role of other organisations and stakeholders**

The Ministries of Local Government, Education (MOE), Health (MOH), NGO's, Academic and Research Organisations and Civil Society shall provide the necessary support for effective implementation and sustainability of the rural water and sanitation programme. The goals in this area can be achieved through the National Water and Sanitation Collaborative Forum and in particular through the individual roles played at the institutional as well as the national level. They will be involved in: -

- a) Effective collaboration to achieve MDGs for water and sanitation; Ensuring effective collaboration between DCs and SALWACO;
- c) Ensuring greater visibility and funding support for water and sanitation at the DC
- d) Mainstreaming sanitation and hygiene in the educational curricula) Defining national indicators and measuring outcomes from water and sanitation interventions within a consultative framework

#### **8.1.8. Guidelines for Private Sector Provision of Goods and Services**

The private sector has a key role to play to complement those of the public sector and communities. Its role in the sector has traditionally been limited to the supply of goods and services even though there is great potential in improving efficiency and creating accessibility through partnerships between communities and the local private sector.

Under the NWSSP the private sector's role will be to: -

- a) Provide consultancy (design and construction supervision, hydro-geological, training, mobilization and hygiene promotion, institutional support, etc.);
- b) Construct water and sanitation facilities;
- c) Supply equipment, spare parts, etc.;

- d) Operate and maintain water supply and sanitation infrastructure including electrical/mechanical equipment;
- e) Manage water supply schemes in partnership with communities; and
- f) Develop and implement community water and sanitation schemes in partnership with DAs and/or communities.

The weak areas, particularly the inadequate drilling capacity, will be strengthened to meet the borehole targets set under the NWSSP.

Further, the issue of standardization of hand pumps to make their procurement together with spare parts viable business for the private sector will be addressed. SALWACO has submitted proposals to adopt a number of hand pumps as standard ones for use in the country. UNICEF is also putting arrangements in place to finance the setting up of spare parts shops at District level. Guidelines for dealing with the two issues are presented in Appendix 8.

#### **8.1.9. Integration of women and gender sensitivity**

One of the guidelines of the NWSSP is to maximize health benefits by integrating water, sanitation and hygiene education interventions. Gender-sensitivity and mainstreaming is vital in water and sanitation programmes. Women (and girls) and Men (and boys) use water in different ways and share the burden of collecting water disproportionately. The success of water and sanitation projects requires the active involvement of women, because it is they who fetch and store water, dispose of domestic waste and children's excreta, and teach hygiene habits to children. The decision-making role of women under the COM concept is therefore crucial and needs to be practicalised. Women shall therefore be actively involved in the planning, technology selection, oversight and management, and the operation and maintenance of water and sanitation systems.

The strategy is to ensure that the interests of women and children are considered and protected in the design and management of water and sanitation in rural and small town communities by promoting the role of women in the planning and management of services.

A draft gender lens for the planning and implementation of water and sanitation projects to guide communities and sector practitioners is presented in Appendix 2.

## **8.2. Guidelines for participatory planning and implementation**

The draft covers the participatory aspects of the design process, including population size and water demand assessment (based on the socio-economic situation of the community); basic planning and design criteria; water source selection; energy source selection; choice of technology (HDW, BH, spring, gravity, etc.) cost options; etc. The draft guidelines are presented in Appendix 3.

Similar guidelines were provided in the National Action Plan for Water Supply and Sanitation for Sierra Leone (1981-1990). They can be compared with what is in the draft and adopted after relevant amendments.

Assistance will be provided by SALWACO in the absence of the DC, to undertake the population and demand studies, the socio-economic studies, the water source and energy source selection, choice of technology with costs, etc. The basic planning and design criteria will be provided by the Planning Unit (Water) of MEP.

In the absence of the District WATSAN Department, SALWACO will assist with procurement of consulting and contracting services such as preparation of contract documents, request for bids, evaluation of bids, award of contract, monitoring contract execution and project management.

### **8.2.1. Participatory Planning**

The design of water supply system shall be done in close collaboration with beneficiary communities. Meetings shall be held with the communities and relevant stakeholders. Stakeholders may include among others:

- WATSAN Committees;
- WATSAN Boards;
- Chiefs in the Chiefdoms;
- General Community;
- District Council key persons;
- Opinion leaders;
- Major commercial and industrial concerns; and
- Schools, health institutions

#### *i) Socio-economic factors*

To be obtained from surveys shall include:

- Pattern of growth of community;
- Relative role of community in district/regional economy;
- Main occupation of inhabitants;

- Existing infrastructure (hospitals, markets, schools, etc.);
- Existing industrial/commercial activities;
- Previous provisions of WSS facilities;

*ii) Population and water demand*

This will take account of:

- Population growth rate;
- Per capita water consumption;
  - Stand pipes; and
  - House connections.
- Industrial and commercial demand; and
- Physical losses.

**8.2.2. Design Procedure**

Shall take account of:

- Source selection;
- Design of treatment units and other auxiliary structures;
- Hydraulic and engineering design of storage reservoirs/tanks, transmission and distribution networks; and
- Selection of electro-mechanical equipment.

*i) Water Source Selection should include*

- Groundwater;
- Springs;
- Relatively unpolluted surface water; and
- Polluted surface source.

*ii) For Boreholes*

Hydrogeological and/or geophysical investigations to locate aquifers and confirm sitting of boreholes, and determine: -

- Yield by pump testing; and
- Quality of water by sampling and laboratory (or field) testing.

*iii) Topographic Surveys*

**8.2.3. Basic design criteria**

Shall include:

- Storage Reservoir Volume;
- Peak daily factor (transmission mains);
- Peak hourly factor (distribution mains);
- Residual pressure;
- Basic design period;
- Pumping time;
- Pipe sizes;
- Galvanised steel/iron;

- No. of people per stand with two outlets; and
- Maximum walking distance to a standpipe.

#### **8.2.4. Choice of Technology**

Shall include:

- Hand dug wells with hand pumps;
- Boreholes with hand pumps;
- Piped Gravity Systems; and
- Piped systems with solar pumps.

##### *Energy Source Selection*

- Grid electricity;
- Diesel Generator; and
- Solar Energy.

##### *Hybrid System*

It comprises a borehole with a submersible pump driven from two alternating power sources – solar and conventional.

##### *Technology Options*

The following shows the population size ranges and the possible technological options from which to make a choice.

<u>Population size</u>	<u>Technological Options</u>
150 – 500	Hand dug wells with windlass Hand dug wells with Nira AF 85. 100 mm drilled wells with Nira AF 85 100 mm drilled wells with Deep Well Pumps. 126 mm drilled wells with two Vergnet Pumps arrangement.
501 – 1500	Hand dug wells with Windlass Hand dug wells with Nira AF 85. 100 mm drilled wells with Nira AF 85 100 mm drilled wells with Deep Well Pumps. 126 mm drilled wells with two Vergnet Pumps arrangement. 126/150 mm mechanized well systems with various energy sources and to two service levels (Standpipe arrangements).
1501 – 2000	100 mm drilled wells with various handpumps 126 mm drilled wells with two Vergnet Pumps arrangement. 126/150 mm mechanized well systems to various service levels and with various energy sources.

2001 – 3000                      126/150 mm mechanized drilled well systems to various service levels and with various energy sources.

**8.2.5 Design Criteria**

The following design criteria will be adopted by the Ministry of Energy and Power:

1. Fuel
 

Average Available Solar Energy	=	5 kwh/m <sup>2</sup> /day
Diesel Fuel Consumption	=	1.0 litres/kwh
  
2. Water Consumption
 

Delivery Systems	Per Capita Consumption (litres per day)	Distance to source (m)
Rope & Bucket delivery	15	500
Dug well	15	500
Handpump delivery	20	500
Standpipe Cluster		
Near borehole	23	400
Protected Springs	20	-
Public Standpipe delivery	25	200
Yard tap delivery	30	10
  
3. Technology and Population Sizes
 

<u>Type</u>	<u>Population Served</u>
One Dug well	150
One Drilled Well	Related to delivery of handpump
One Standpipe	300 persons
One Yardtap	7.5 persons (i.e. average household Size)
  
4. Hydraulic Parameter
 

Minimum Residual head	3 m
Pipe Friction	Hazen-Williams with c=140(uPVC)
  
5. Storage
 

Diesel Powered system	approx. 50% of daily consumption
Solar Powered system	approx. 75%                      “
Hybrid System	approx. 50%                      “
  
6. Operations
 

Solar System	=	1 caretaker
Diesel system/Mains Connection	=	1 attendant per 8 hr shift Maximum
Daily operation (Diesel/Mains)	=	16 hr – 2 attendants for 2 shifts.
  
7. Success Rate (Boreholes)                      =                      66% (two-thirds)
8. Discount Rate    =                      10%

### **8.2.6 Guidelines for Technology Choice for Sanitation**

#### *Technology Options*

The technological choice of sanitary facilities shall include and not limited to the following:

- i) VIP;
- ii) KVIP latrines;
- iii) Pour flush toilets; and
- iv) Septic tanks.

Latrines, especially the institutional latrines shall be designed to incorporate hand-washing facilities.

The NCWSP will encourage household and schools to select from a wide-range of technology options for sanitation, with a view towards promoting the use of locally available and traditional building materials.

#### *Rural Communities*

- Rectangular single pit VIP (lined and unlined)
- Mozambique single pit VIP (lined and unlined)
- Double pit VIP
- San plat

#### *Small Towns*

- 1-3 seater KVIP
- Pour Flush
- Neighbourhood KVIP up to 4 seater
- WC/Septic tanks

#### *Institutions (Depending on population):*

- 4-seater KVIP
- 6-seater KVIP
- 8-seater KVIP
- 10 seater KVIP

For households: two units - one for male and one for female.

For schools: three units - one for teachers, one for boys and one for girls.

For public institutions, markets, clinics: two units - one for males and one for females.

A standard of 50 pupils per drop hold would be used to determine the capacity of each school KVIP latrine to be constructed. All facilities will be designed for both sitting and squatting positions. The use of appropriate local materials will be encouraged. Continuous education support will be provided.

The technologies for toilets shall meet the following requirements: -

- i) Store human excreta to avoid human/animal contact;
- ii) Treat excreta to eliminate or reduce pathogens;
- iii) Resource recovery-oriented, (recycling, ...)
- iv) Affordability;
- v) Easy to construct, operate and maintain;
- vi) Must be less-dependant on water;
- vii) Prevent ground water pollution;
- viii) Odourless and flyless

*i) Standards and Specifications*

Technical assistance shall be provided by SALWACO with regards to: -

- Hand dug wells (upgrading from existing wells, wells with circular block lining, wells with in-situ lining, well head design for fitting hand pump).
- Latrines: Mozambique type VIP, KVIP household and public.
- Boreholes (100 mm, 130 mm & 150 mm), well pad design, siting procedures, water quality parameters.
- Hand pumps (direct action pumps, deep well pumps, storage tanks, piping, stand pipes)
- Electric and solar pumps
- Small piped distribution networks

*ii) Estimated cost of standard systems*

If the information is not already available, a Task Force could be established to work out packages for: -

- Hand dug wells fitted with reliable direct action hand pumps.
- Boreholes equipped with hand pumps
- Piped systems with boreholes
- Piped systems with solar pumps
- Piped gravity systems.

*iii) Standard sketches/Drawings*

The National Action Plan to Water Supply and Sanitation (1981-1990) for Sierra Leone contains sketches and drawings for hand dug wells, drilled boreholes fitted with hand pumps, spring improvement, etc. and also various types of latrines. These must have been used by the Water Supply Division of the Ministry of Energy and Power. These sketches/drawings should be reviewed and, if found suitable, adopted with or without amendments and issued by the MEP for general use.

**8.2.7 Implementation**

This will consist of:

- a) Preparing contract documents showing: -
  - Contract Agreement
  - Drawings
  - Specifications

- Bills of Quantities
- b) Invitation or advertisement to Bidders (according to standardized format)
- c) Evaluation of bids and criteria for evaluation.
- d) Award of Contract
- e) Contract execution.

**8.2.8 Design Guidelines**

Specific guidelines will be found in Appendix 3.

***Guidelines for Financing***

Capital costs accruing to rural water and sanitation projects shall continue to be subsidized. The level of these subsidies will be determined from time to time and will be reviewed within a national stakeholders' consultative framework. These subsidies may be captured through direct GOSL funding or through support from Development Partners.

Additional contribution shall come from the communities and the District Councils.

**8.2.5. Community contribution**

Although GOSL has the chief responsibility for funding the NWSSP, sustainability is based on community participation and ownership, and therefore requires community contribution. Community contributions will pay part of the capital cost of the basic services and all of the recurrent costs of their water and sanitation facilities. Higher levels of water and sanitation services are encouraged, but beneficiaries will be required to pay a substantial part of the added cost.

*i) Levels of community contribution*

Community contribution will be based on the following categorizations: -

Table 4: Community contributions to capital cost

<b>Type of community</b>	<b>Contribution to capital cost</b>
Village communities with point sources	5%
Small towns piped systems	2.5% for new water supply systems
	50% of the additional cost for levels of service higher than basic water supply services
	100% for house connections

*ii) Modalities for community contribution*

The modalities for collecting community contributions will be established by communities themselves. In order to avoid undue delays to project construction, community contribution to capital cost shall be in cash. However, depending on the technology choice, “in-kind” payments (labour, materials etc.) shall be accepted in lieu of cash payments.

*iii) Mechanism for calculating contributions*

The mechanism for calculating contributions will be as follows:

- Community contribution for point sources shall be based on the aggregation of regional averages for the cost of civil works and the pump. SALWACO shall provide the basis for the calculation of the required amount;
- The agreed amount for community contribution for point sources shall be reviewed by SALWACO every two years;

*iv) Use of Community Contribution*

The use to which community contributions are put (if they are demanded at all) differs from one Donor/NGO to another, including financing part of the capital cost of projects, creating a fund to meet future operation, maintenance and replacement expenditures. As sustainability is increasingly becoming an issue, community contributions shall be directed into a fund to meet future operation and maintenance as well as replacement expenditures.

**8.2.6. District Council contribution**

In order to foster a greater sense of commitment at the local authority level, DCs shall contribute 5% (five percent) of the capital cost of water supply and sanitation projects. DCs may wish to commit more resources to projects as long as these do not replace the contributions expected from communities.

**8.2.7. Credit Financing**

Traditionally, DCs have depended on centrally-negotiated donor funding to undertake water and sanitation projects. This leaves communities at the mercy of funding institutions and central government, even though DCs may have a well defined District Water and Sanitation Programme. To increase the pace of water supply delivery, and to further strengthen the concept of decentralisation, DCs shall source financing for water supply projects on the basis of well-defined business plans.

#### ***8.3.4 Guidelines for financing sanitation and hygiene education***

The source of funding for hygiene education and sanitation delivery shall come mainly from the Government of Sierra Leone, DCs, Donors, NGOs, communities and private individuals.

All the water supply projects shall have a budget allocated for sanitation delivery and hygiene education to meet NWSSP requirements. Development Partners and NGOs shall incorporate sanitation and hygiene education in all projects in compliance with the national strategy.

##### *Financing sanitation and hygiene education*

Communities, through their Water Boards and WATSANS, will be encouraged to incorporate in their water tariffs a component to finance hygiene education and environmental sanitation.

##### *Approaches to financing*

Projects will adopt the following approaches to financing: -

- Subsidy (for institutions, village communities and small towns);
- Voluntary work groups (long-term vision for both village communities and small towns);
- In-kind contribution (for schools).

##### *Subsidy (for Village communities)*

Financing for the sanitation delivery will consist of a subsidy amounting to 50% of total cost of the basic service level facility requested for. The subsidy will cover the cost of the following items: -

- Vent pipe;
- Slab;
- Ring beam; and
- Related artisan's workmanship fee.

##### *Subsidy (for Small towns)*

Financing for small towns household sanitation will consist of a subsidy amounting to 5% of total cost of a basic sanitation facility requested for. Basic sanitation facility is defined as one seater KVIP per maximum of 8-member household. Households requesting for higher service facilities will be fully responsible for all additional cost.

##### *In-kind Contribution (for Schools)*

The cost-sharing ratio for the school sanitation will be the same as that of communal facilities: -

- 5% school Parents Teachers Association
- 5% DC
- 90% Project

Schools can, however, benefit from the project under slightly different cost-sharing arrangement whereby they will provide labour, and

materials such as sun-dried bricks. As with water supply, the schools may serve as entry points for hygiene promotion.

*Voluntary Work Groups*

The long-term vision of the sanitation strategy is to eliminate all subsidies and rely more on promotion and marketing. Individuals could come together to form voluntary work groups and assist each other, in turn, to pay for, or construct, facilities. Artisans will promote their services to these individuals/gangs who will then contract them to build their facilities.

*Subsidy management*

Subsidies will be provided by District Councils to beneficiaries under the sanitation components of projects funded under the NWSSP. Standard material schedule for the various technology options would be developed and each region would determine the Leone amount for the subsidy-items, based on market survey.

**8.3.5 Ensuring sustainability of water and sanitation facilities**

To ensure sustainability of water and sanitation facilities, communities shall be responsible for all operation and maintenance expenditures, either through their WATSAN Committee and WATSAN Boards or through nominated operators.

A system may be considered to be sustainable if it provides reliable and good quality water in sufficient quantity over the design period of the system. To ensure sustainability, the system needs to be adequately designed and all operation and maintenance requirements should be met, with the implication that:

- Communities shall ensure setting and paying appropriate tariffs;
- The systems are managed in a transparent and accountable manner;
- SALWACO and DCs should ensure effective community management of the systems by monitoring and advising on the administrative, technical and financial performances of the WATSAN Committees and Boards.

### **8.3. Guidelines for Operation and Maintenance**

WATSAN Committees or Boards will be required to operate and maintain the water supply systems so that they deliver water of acceptable quantity and quality on a continuous basis over the design life of the facility at an acceptable and affordable cost.

#### *Major repair, replacement and rehabilitation*

Communities shall undertake all major repairs and replacements. Cost sharing arrangements and procurement procedures for total rehabilitation of existing system components shall be the same as for new systems.

#### *Future expansion*

The cost of expansion of the system to additional area(s) shall be borne by the respective community from tariff revenue and other sources, provided the:

- a) Area(s) to be covered is(are) identified as integral part of the community and not uniquely separated; and
- b) Existing water resources have adequate potential for any expansion.

Where communities are uniquely separated from the additional areas to be covered, these areas shall be provided with systems following the SALWACO approved cost sharing and procurement procedures for new systems, provided the: -

- a) Additional population to be served is above 3,000; and
- b) Existing water resources are adequate.

In order that WATSAN Committees and Boards may pay attention to the sanitation aspect of their functions, where water revenues accrue, sanitation and hygiene promotion benefit from such revenues. To this end, District Councils shall require that all communities set up the following accounts into which stated portions of tariff revenues will be deposited:

- a) Replacement fund; and
- b) Sanitation and hygiene fund.

DCs and WATSAN Committees and Boards shall ensure prudential management of these funds. Where there are justifiable and compelling reasons to commit any funds unrelated to water and sanitation, this shall be considered by the DC and appropriate approval given. The overall management (technical, administrative, financial and commercial aspects) shall be the full responsibility of the community (WATSAN Committees and Boards).

The Community shall be assisted through training and various guides to carry out its responsibilities. The SALWACO regional office, the District

Council Water and Sanitation Department and NGOs, will offer the assistance.

### **8.3.1. Options for Operational Management**

#### *i) Management guidelines*

The WATSAN Committees and Boards shall exercise an overall management responsibility for the Village and Small Town WSS through sound administrative, technical, financial and commercial management practices. The Committees and Boards shall be supported in this capacity by all relevant public and private sector institutions, notably, the District Council, SALWACO, NGOs and private companies.

#### *ii) Operational management options*

There shall be three main options for management of operations and maintenance of the water supply systems.

*Option 1:* The community, through its WATSAN Committees, Boards and employees, operates and maintains the water supply system entirely by itself. A trained Manager, Operator, and Financial/Administrative staff shall be employed by the community to carry out daily operation and maintenance activities. They shall be supported by skilled masons, plumbers, electricians, mechanics, etc., from within the community whose services may be procured when necessary on a retainer basis.

*Option 2:* The community, through its WATSAN Committees or Boards hires staff for the daily operation (financial, administrative, technical and commercial) and maintenance and signs a contract with a firm or firms to perform other specialized technical, financial, commercial or administrative functions on a periodic basis. Such functions may include the preparation of financial reports, internal auditing or some aspects of planned maintenance.

*Option 3:* The community, through its WATSAN Committees or Boards contracts a firm to completely operate and maintain the water supply system including meter reading, billing and revenue collection, etc., for an agreed fee. This arrangement enables the WATSAN Committees or Boards to set performance standards for a set period of time.

Other management options may be adopted where necessary. Each Committee or Board, in consultation with the community it represents, and with the relevant technical support provided by SALWACO must decide on the management option to be adopted. The choice of the most appropriate option depends on a number of factors, which include: -

- The complexity of the water supply system;
- The quantity of water being produced/number of people served;
- The socio-economic status of the community; and

- The interest and commitment of the community towards operational management of the system, etc.

Generally, the following guidelines shall apply:

- i) Communities with up to 3,000 people served with groundwater, spring-based or slow sand filtration systems may adopt Option 1, provided they are interested and committed to the operational management of the water supply systems themselves.
- ii) Communities of 3,001 – 15,000 people served with simple boreholes, gravity or slow sand filtration based piped systems may adopt Option 2.
- iii) Communities with populations of above 15,000, and/or communities served with complex water supply systems may necessarily adopt Option 3, unless they have the requisite expertise within the community.

Other options may be considered exclusively for the production and distribution components of the water supply system. Option 2 or 3 may be adopted for the management of the production component of a system, provided it consists of a surface water treatment plant or several mechanized boreholes. However, the same or a different option may be adopted for the distribution network, depending on its size and complexity.

Public education should be carried out regarding the complexity of operation and maintenance of large schemes during the mobilization and construction phases of the project cycle before commissioning of the water supply systems.

Guidelines/Manual for setting out procedures for point sources and piped systems shall be provided by SALWACO. Draft Guidelines for Operations and Maintenance are presented in Appendix 4.

### **8.3.2. Guidelines for tariff-setting and Implementation**

The setting of tariffs by WATSAN Committees and Boards shall be in conformity with guidelines prepared by SALWACO. Tariffs must meet the operation and maintenance costs as well as provide a margin for future replacement. Draft Guidelines for Tariff setting and implementation are presented in Appendix 5.

In the short term, communities will be required to continue the operation and maintenance of the water supply facilities and tariffs shall therefore be designed to capture these. In the medium term to long term, the principle of full cost recovery will be pursued, particularly in small towns with systems under WATSAN Committees and Boards management. Full cost recovery refers to:

- Operation and maintenance;
- Provision for replacement;
- Depreciation; and
- Provision for extensions and rehabilitation.

In village and small town communities, public subsidies to capital cost will continue to apply. In some water-scarce communities with complex and expensive-to-run systems, the inclusion of depreciation may lead to excessively high tariffs, which could impoverish these communities. DCs shall take into account such special circumstances in defining appropriate medium and long-term support for such communities.

#### **8.4. Guidelines for Monitoring and Evaluation**

The purpose of monitoring and evaluation is to ensure: -

- Self-regulation at the community level as a first step in achieving good governance, and maintaining service and quality standards, thus reducing to a minimum interference from supervising bodies;
- That appropriate tariffs are designed and implemented;
- Good drinking water quality, in the light of the low capacity at DCs and community level to undertake these tasks adequately; the enforcement of drinking water quality standards becomes particularly relevant as the private sector is given a greater role in the operation and maintenance of small town water supply systems;
- The commitment of public sector agencies – like the schools and hospitals, police - to pay for the use of water in order to ensure the viability of small town water systems.
- District level administrative and legislative support to enhance the work of WATSAN Committees and Boards;
- The implementation of the NWSSP to aid planning and provide remedial measures.

The areas to be monitored are: -

##### *Service standards*

The standard and level of service provided by the operators of the water supply system shall be in conformity with those defined during planning for the project with the full participation of the community.

##### *Tariff-setting*

Communities will be guided by tariff-setting guidelines issued by SALWACO. The tariffs will be subject to approval by the DC, and shall take into account fairness, equity and the need to support the poor and vulnerable groups. SALWACO, through the regional offices, shall monitor the tariffs set by communities to assess compliance with the guidelines.

*Guidelines for drinking water quality and monitoring*

Monitoring drinking water quality shall be an important aspect of the public sector role in community water supply. Whilst WATSAN Committees and Boards and operators have a primary responsibility for ensuring that the water produced meet defined standards, it is equally true that the capacity at that level may be inadequate to carry out rigorous water quality testing. See Appendix 6 for Guidelines.

Regular water quality monitoring shall be the responsibility of Ministry of Health and Sanitation. The Ministry shall submit regular reports on its monitoring activities to the DCs. However, the capacities for monitoring drinking water quality standards are not the same in all regions. The Ministry of Health and Sanitation will be tasked to study the various capacities and propose arrangements that are practicable for monitoring drinking water quality at the community level within the various regions. This shall include the use of local laboratories and facilities owned by GOSL and private professionals/practitioners. The guidelines for water quality testing for use by communities are presented in Appendix 6.

*Public Sector Commitment to Pay for Water Use*

To address the situation of non-payment of bills of public institutions, DCs shall assist in the enforcement of payment and where appropriate shall enter into arrangements with WATSAN Committees and Boards and private operators that provide safeguards against non-payment. A draft Memorandum of Understanding between DCs and WATSAN Committees and Boards is presented in Annex 7.

*Enactment and Enforcement of Bye-laws*

DCs shall enact and enforce byelaws necessary to support water and sanitation service delivery within the communities. In addition, use may be made of the court system, as well as traditional sanctions and arbitration may be used to ensure compliance with the basic rules and regulations supporting the delivery of water and sanitation services. DCs role in enforcing rules on sanitation will be particularly useful in this regard.

*Sample Formats*

Draft formats for monitoring and evaluation are presented in Appendix 9.

## **9 APPENDIX: DRAFT GENERIC BYE-LAW FOR ESTABLISHMENT OF WATER AND SANITATION COMMITTEES AND WATSANS BY DISTRICT COUNCILS**

Whereas the District Council is a body corporate created under the Local Government Act 2004, Act 15 and is the highest authority in the District with power to acquire, hold and dispose of movable and immovable properties for the discharge of its functions which include the provision of water and sanitation services.

### **AND**

Whereas as part of the decentralization policy of the Government and in accordance with section 21 of Act 15 the District Council has the power to delegate its functions other than its legislative functions to an individual or group.

Now therefore the Council designate and delegate the responsibility for the overall policy-making on water and the management of the water supply systems in (.....) under the jurisdiction of the ..... District Council to the ..... (community) WATSANs to hold the water systems in trust and manage for and on behalf of the Council in prudence by the same WATSANs under the authority of the Bye-Laws herein contained.

Pursuant to the powers vested in the Council under section 90 of Act 15 these Byelaws are hereby made this .....day of..... 2002.

### **1. Name**

- 1.1 There is hereby established for each area or community listed in the Schedule to these bye-laws a body which shall be called WATSANs whose functions shall be applicable in the areas or communities as the case may be and such other functions as may from time to time be added through amendment to these bye-laws.
- 1.2 The WATSANs may for and in connection with the discharge of its functions purchase, hold, manage or dispose of any property either movable or immovable and may enter into such contracts and transactions as may be reasonably related to its functions and which are not inconsistent with existing Local Government laws and may sue and be sued in its own name.

### **2. Legal Authority of the WATSANs**

- 2.1 The WATSANs takes its legal authority from the District Council and the Council shall approve and adopt all resolutions and byelaws proposed by

the WATSANs upon prior consideration on the legality and appropriateness of such resolution and byelaws.

- 2.2 The Council vest in the WATSANs power to enter into contracts which are within its power with the private sector for the purpose of operating, maintaining, repairing, replacing and managing of all water systems specified in the schedule.

### **3. Independence of the WATSANs**

Subject to the provisions in these Byelaws the WATSANs shall not be subject to the direction or control of any person or authority in the performance of its functions.

### **4. Composition**

The WATSANs shall comprise not more than ... members of whom at least (1/3) of members shall be women as follows:

- a. ... representative each from area Water and Sanitation (WATSAN) Committees established in designated localities or communities as may be duly understood to be the representative of the locality or community.
- b. ... Council members selected by the Council.
- c. At least ... representative representing water user groups in the community
- d. At least ...representatives representing women organizations in the area.
- e. At least ...representatives of water related organizations in the community.
- f. ...representatives of the traditional authority elected by the Chiefdom Council.

### **5. Tenure of Members**

- 5.1 Persons appointed to the WATSANs shall serve a four year term and members subject to good behaviour, shall be eligible for re-appointment for another four year term
- 5.2 A member of the WATSANs may at any time by a letter to the Chairman and the nominating body resigns his office.
- 5.3 A member who is absent from three consecutive meetings without sufficient cause or reason shall cease to be a member.
- 5.4 A member of the WATSANs may be removed from office by the Executive Committee in consultation with the nominating body for inability to perform the functions of his office, for stated misbehavior or for any other just cause provided always that such a removal shall be endorsed by the Council.

- 5.5 The Executive Committee shall notify the nominating body of vacancies that occur in the membership of the WATSANs within one month of the occurrence of the vacancy.

## **6 Filling of Vacancies**

- 6.1 When a member of the WATSANs is incapacitated by illness or any other cause from performing the functions of his office for more than six months the Executive Committee may acting in consultation with the appropriate nominating body appoint another person to perform the functions of the member until the member is able to resume the performance of his duties.
- 6.2 Where a person is appointed to fill a vacancy he shall hold office for the remainder of the term of the previous member and shall subject to section 5(1) of these Bye-Laws be eligible for re-appointment.

## **7 The Executive Committee**

- 7.1 The WATSANs shall elect an Executive Committee of at least 5 members comprising a Chairman, Secretary, Financial Officer, a Technical Officer and one other member of which at least one of whom shall be a woman.
- 7.2 The Executive Committee members shall serve a two-year term and shall be eligible for re-election for a further two-year term.

## **8 Delegation Of Responsibilities**

- 8.1 The WATSANs shall delegate its management functions to the Executive Committee and the Executive Committee may appoint competent members of the Committee to undertake the various functions so delegated by the WATSANs.
- 8.2 The Executive Committee shall report to the WATSANs every three months all the activities performed in the name of the WATSANs.
- 8.3 The Executive WATSANs in the discharge of its functions may appoint committees comprising members or non-members or both and may assign to them such functions as the Executive Committee may determine except that a committee composed entirely of non-members may only advise the Executive Committee.

## **9 Mandate of the WATSANs**

- 9.1 The WATSANs shall be responsible for the management of the operation and maintenance of all systems in the community within the jurisdiction of the District Council.
- 9.2 Without prejudice to subsection (1) of this section, the WATSANs shall:

- (a) prepare plans for the establishment, rehabilitation and expansion of existing as well as new systems in any community specified in the schedule to these byelaws.
- (b) Determine the appropriate financial contributions where necessary by members of the community towards the capital cost of constructing a community water supply system.
- (c) Contract a private operator where appropriate to carry out operation and maintenance and repair and replacement of parts of the water supply system in the community.
- (d) In prior consultation with the community and the private operator as the case may be propose an appropriate tariff to cover the cost of operation and maintenance of the system and the cost of replacement. Proposed tariff shall be subject to approval by the District Council.
- (e) Procure and supervise qualified persons or bodies to manage and operate the water system for and on behalf of the WATSANs subject to agreement as may be signed between the WATSANs and the District Council on one hand and the said person or body.
- (f) Recommend appropriate and relevant byelaws to the Council for the regulation of water use, enforcement of tariffs and other financial obligations and promote sanitation and hygiene practices within the community.
- (g) In collaboration with the private operator, or any other person or body, or the Council as the case may be undertake public education on tariff obligation and sound sanitation and hygienic behaviour within the community.
- (h) To manage an effective and accessible customer relations system
- (i) Set procedures and charges for service connection, disconnection, penalties for default and damages to the water system subject to the prior approval of the Council.

## **10 Tariff Setting Procedure**

In setting tariffs the WATSANs shall be guided by the Community Water and Sanitation Agency Tariff Setting Guidelines as provided in Schedule 1.

## **11 Financial and Miscellaneous Provision**

11.1 The Funds of the WATSANs shall include-

- (a) subvention from the District Council
- (b) monies accrued from tariffs and connection fees
- (c) receipts from private operators responsible for operation and maintenance where applicable
- (d) any monies accruing to the WATSANs in the course of the performance of its functions

- (e) gifts, and
- (f) monies from any other source.

## **12 Financial Management**

- 12.1 For the purpose of managing its finances the WATSANs shall establish its own bank account or accounts.
- 12.2 The Chairperson of the WATSANs, the Secretary or the Treasurer shall be the signatories to the accounts of the WATSANs provided that signatures of the Chairman and any of the remaining two signatories shall be sufficient to validate any cheque.

## **13 Accounts and Audit**

- 13.1 The WATSANs shall keep book of accounts and proper records in relation to them and the account books and records of the WATSANs shall be in the form approved by the Council.
- 13.2 The books and accounts of the WATSANs shall be audited annually by auditors approved by the Council within three months of the end of the immediately preceding financial year.
- 13.3 The financial year of the WATSANs shall be the same as the financial year of the Council.

## **14 WATSANs Meeting and Reporting**

- 14.1 The WATSANs shall ordinarily meet for the dispatch of business at such times and as such places as the Chairperson may determine, but shall meet at least once every three months.
- 14.2 The Chairperson may, at the request either in writing or oral of not less than one-third of the members of the WATSANs convene a special meeting of the WATSANs.
- 14.3 At every meeting of the WATSANs the Chairperson shall preside and in his or her absence a member elected by the members present from among their number shall preside.
- 14.4 The quorum at a meeting of the WATSANs shall be one third of the members of the WATSANs.
- 14.5 Questions proposed at the meetings of the WATSANs shall be determined by a simple majority of the votes of the members present and voting and where the votes are equal the Chairperson or the member presiding shall have a casting vote.
- 14.6 The WATSANs shall appoint one of its members as the Secretary to the WATSANs and the Secretary shall in consultation with the Chairperson arrange the business of the WATSANs and the Secretary shall record and keep minutes of all WATSANs meetings. Records of meetings shall be posted by the Secretary at the community notice WATSANs and other areas accessible to all community members.

### **15 Presentation to the Council**

The WATSANs shall report to the Council on the status of the community water system at least twice a year or as many times as the Council may determine.

### **16 Community Forum**

The WATSANs shall give an opportunity to the community to participate in the review of the WATSANs work and shall organise a Community Forum at least twice every year. The Forum shall also be used to educate the community on their obligations to support the management of the water and sanitation system in the community.

### **17 Offences**

Any person who willfully destroys or tamper with a water distribution line, a public standpipe or tampers with any metering or water monitoring device or illegally connects water to his premises shall be guilty of an offence and shall be liable on summary conviction to a fine of not less than ... to an imprisonment not exceeding ... or to both.

### **18 Amendment of Bye-Laws**

- 18.1 These Bye-Laws may be amended at any time deemed necessary by the Council for the achievement of the objectives of the WATSANs provided always that such amendment shall be made through the statutory procedures established for amending District Council Bye-Laws and in the presence and with the active participation and consent of the Council members for the said communities.
- 18.2 The schedule hereto may be amended by the addition of such other communities or areas as is deemed appropriate for the application of these Bye-Laws by a Resolution of the Council.

### **19 Transitional Provisions**

Notwithstanding any provision to the contrary in these Bye-Laws the Water and Sanitation Development WATSANs in existence prior to the promulgation of these Bye-Laws shall continue to operate and exercise all powers as if established under these Bye-Laws.

### **20 Interpretation**

In these Bye-Laws unless the context otherwise requires:

**“WATSANs”** means the Community Water and Sanitation Committees for villages and WATSAN and Sanitation Boards for small towns WATSANs set up in pursuance of these Bye-Laws.

**“Community”** means a group of households that refer to their settlement by the same name.

**“District Council”** means a Council established in a District under the Local Government Act 2004 (Act 15) and includes Municipal and Metropolitan Assemblies.

**“Small Town Water Supply”** means pipe-borne water supply systems in Small Towns

**“System”** means all equipment and plant used for water production and distribution and other related assets such as lands, buildings, vehicles, office equipment necessarily required for the operation and maintenance of the system.

**“Tariff”** means the price at which water is sold

## **10 APPENDIX: DRAFT GENDER LENS FOR THE PLANNING AND IMPLEMENTATION OF WATER AND SANITATION PROJECTS TO GUIDE COMMUNITIES AND SECTOR PRACTITIONERS**

### **Preamble**

1. How many women and men are on the WATSANs/WSDBs
2. Does the data used for planning capture concerns/problems affecting both males and females?
3. After problem analysis what peculiar (needs of men and women need to be addressed?
4. Are both women and men involved in the prioritization of projects and programmes?
5. Will the impact of planning be beneficial to both males and females?
6. Will men and women be involved in implementing the plan or project?
7. Did men and women approve/the plan?
8. How will timing of implementation of the project affect females and males?
9. Do women and men participate in the award of contract?
10. Are men and women adequately represented on the DWST and WATSANs?
11. Who hold key positions in the WATSAN committees, men or women?
12. Are women and men given equal opportunity to contribute at community meetings?
13. Do men and women carry out community sensitization on hygiene and sanitation improvement?
14. What role do men and women play in keeping water and sanitation facilities clean?
15. Are both men and women equally involved in site selection, construction and maintenance?
16. Are women and men selected as hand-pump caretakers?
17. How does accessibility or distance to the water point affect women and men?
18. How are women and men involved in decision-making?

## **11 APPENDIX: DRAFT GUIDELINES FOR PARTICIPATORY PLANNING AND DESIGN**

### ***Introduction***

Design of **Small Towns** water supply schemes shall be in accordance with the following SALWACO Design Criteria and Guidelines.

### ***Water Supply Technologies***

The main water supply technologies to be adopted shall include:

- a. Groundwater based piped systems;
- b. Spring or highland water supply systems (Gravity systems);
- c. Surface water/Slow sand filtration piped systems;
- d. Package Treatment Plants;
- e. Other technologies to be adopted, where necessary.

### ***Water Source Selection***

Selection of water sources shall ensure minimum development costs, and shall be in accordance with the following order of preference:

- a. Groundwater abstraction;
- b. Springs;
- c. Relatively unpolluted surface water sources;
- d. Polluted surface water sources.

### ***Energy Source Selection***

Selection of energy sources shall be in accordance with the following order of preference:

- a. Grid Electricity;
- b. Solar Energy;
- c. Diesel Generator.

## **DESIGN GUIDELINES**

### ***Participatory Design***

The design of water supply systems shall be done in close collaboration with the beneficiary communities. Meetings shall be held with the communities and relevant stakeholders. Stakeholders may include the following, among others:

- WATSAN Committee
- WATSAN Board
- Traditional Authorities
- General Community
- District Assemblies
  - District Administrator

- Co-coordinating Director
- Planning Officer
- District WATSAN Department Officials
- Opinion Leaders
  - Assembly Members
  - Leaders of Religious Bodies
  - Leaders of Youth Groups and Co-operatives
  - Heads of Major Institutions
- Major Commercial and Industrial Concerns
- Schools, Health Institutions etc.

**General Design Procedure**

The design of a typical water supply system shall consist of:

- a. Source selection;
- b. Design of treatment units and other ancillary structures;
- c. Hydraulic and engineering design of storage reservoirs/tanks transmission and distribution networks;
- d. Selection of electromechanical equipment.

**Boreholes**

Hydrogeological and/or geophysical investigations shall be carried out to locate water-bearing aquifers and confirm siting of boreholes. The minimum yield of a borehole to enable mechanisation shall be 85 l/min. However, depending on a comprehensive assessment of existing hydro geological conditions, and an adequate technical evaluation of the yield of available boreholes, boreholes with lower yields may be mechanised, particularly for Category I towns.

Existing boreholes shall be developed and pump tested to obtain yield before possible mechanisation. Existing boreholes/wells fitted with Hand Pumps and with adequate yield shall be integrated into the design of new water supply systems.

**Topographic Surveys**

Topographic Surveys shall be carried out to enable hydraulic design of the networks. All topographic surveys shall be done in accordance with standards and guidelines prescribed by the Ghana Institution of Surveyors.

**Basic Design Criteria**

The following criteria shall be used in the design process.

• Storage Reservoir Volume	35 - 40 % of Average Daily Demand
• Peak Daily Factor (Transmission Mains)	1.2
• Peak Hourly Factor (Distribution Mains)	2.5 minimum

(Design software simulating hourly flows may be used for hourly factors.)	
• Residual Pressures (Distribution System)	10m head minimum 60m head maximum 3 m head at outlets at peak hour flow 20m head max at outlets
• Basic Design Period	10 years
• Pumping Time	16 hours maximum
• Pipe Sizes	75mm - minimum for transmission mains
	50mm - minimum for distribution mains.
	19mm - minimum for house connection.
	uPVC pipes to be provided for distribution mains.
	uPVC/HDPE pipes to be provided as minimum diameter pipes leading to standpipes.
• Galvanised Steel/Ductile Iron to be provided for exposed piping.	
• 600 people per standpipe with two outlets.	
• Maximum Walking Distance to a Standpipe shall be 500m.	

**Design Periods**

The general design period for construction of Small Towns Water Supply Systems shall be 10 years from the expected time of commissioning. Individual components of the system may have varying design periods determined from the expected time of commissioning as follows:

• Reservoirs/Tanks	
- Volume (sizing)	- 10 years
• Transmission Mains	- 10 years
• Distribution	
- Mains	- 15 years
- Branches	- 10 years
• Public Standpipes	- 10 years
• Pumps	- 10 years
• Transformers	- 15 years
• Source	- 15 years

**Population and Water Demand**

The following criteria shall be used to determine design population and water demand.

• Population Growth Rate	Per Regional Average (2.5 - 3.5%)		
• Per Capita Water Consumption			
- Standpipes SP	20 lcd		
- House Connections HC	60 lcd		
• Industrial and Commercial Demand	10 - 20 % of the Domestic Demand		
(To be determined based on actual socio-economic surveys)			
• Physical losses (Losses of 10 - 15% shall be applied where existing pipelines are to be rehabilitated. Adequate engineering studies need to be carried out to enable rehabilitation to be effected.)	8 - 10 %		
• The share of population having access to standpipes to house connections shall be determined based on socio economic and willingness to pay studies, and in accordance with the following:			
<b>Category</b>	Category I	Category II	Category III
Category IV			
<b>Population</b>	2,000 - 5,000	5,001 - 15,000	15,001 - 30,000
30,001 - 50,000			
<b>% SP</b>	80 - 90	75 - 85	70 - 80
60 - 75			
<b>% HC</b>	10 - 20	15 - 25	20 - 30
25 - 40			

***Socio-Economic Factors for Design***

Each design should be based on socio-economic data obtained through surveys and desk studies. The relevant socio-economic data shall include, among others:

- Pattern and growth of the community;
- Relative role of community in district/regional economy;
- Main occupation of inhabitants;
- Existing infrastructure (hospitals, markets, schools, etc.);
- Existing industrial/commercial activities;
- Previous provision of WSS facilities.

**SUPPLEMENTARY GUIDELINES**

***Electromechanical***

Surge vessels shall be provided where necessary for protection against excessive back pressure including water hammer.

Pump houses shall be provided to house all electro-mechanical and related appliances excluding the borehole head. All Generator Sets shall be housed separately.

Suppliers of all electromechanical equipment shall provide three (3) copies each of relevant operational manuals (in English) to enable adequate operation and maintenance of such equipment.

***Point Source(s)***

Piped schemes shall be combined with point source(s) for optimal coverage, where necessary. In such instance, the point source(s) shall have adequate yield and shall contribute to the overall coverage of the water supply system.

***Losses***

Losses shall be estimated based on the size and complexity of the water supply system. For all population categories, losses of 10 - 15 % shall be applied where systems are to be rehabilitated. Detailed engineering studies including cost benefit analyses shall be carried out to establish the feasibility and economic viability of rehabilitation of existing pipelines.

***Fire Hydrants***

Fire hydrants shall be provided in all district capitals and in other towns with population of over 15,000. For towns with population below 15,000, provision shall be made for a fire fighting draw-off point.

***Water Sources***

Water sources shall be protected by prohibiting human activities within 100 meters radius of the source in case of surface water, and 50 meters in case of ground water.

The quantity and quality of surface water sources including springs shall be monitored regularly for at least one year and the results analysed. Available hydrological data (historical data for 10 years) including community information on quality and quantity of the sources shall be collected and analysed to ensure adequate design.

Contaminated ground water sources shall be monitored regularly for at least one year and the results analysed to enable provision of adequate treatment systems.

***Water Quality***

Water Quality shall meet the relevant Bureau Standards of Sierra Leone (GSB) criteria for drinking water. Safety chlorination shall be provided for all water supply systems.

As much as possible, no treatment systems shall be required for ground water. Where necessary, simple Iron (Fe), Manganese (Mn), Fluoride (F) and Odour removal systems may be provided. Such systems shall have minimal operation and maintenance requirements.

### ***Surface Water Treatment***

Simple, robust and easy to operate treatment units shall be provided to treat water from surface source(s). These units shall include Roughing (pre-treatment) and/or Slow Sand Filtration Systems to improve the physico-chemical and biological quality of the water.

### ***Sterilisation of Tanks and Pipelines***

All storage tanks and distribution pipelines shall be sterilised before commissioning. The following procedure shall be complied with to ensure adequate sterilisation:

#### **Tanks**

After testing for leakages, the tank is filled with potable water containing free chlorine (at least 50mg/l concentration) and left to stand for at least 24 hours, after which samples are taken to measure the residual chlorine. The measured concentration of the residual chlorine should not be less than 10mg/l.

#### **Pipelines**

After pressure testing, water shall be made to run out of the pipes until clear. The pipes shall then be refilled with potable water containing free chlorine (at least 50mg/l concentration) and left to stand for at least 24 hours. All outlets shall be opened at least once in this period. The residual chlorine at the point farthest from the point of injection shall be measured. If the measured concentration of the residual chlorine is less than 10mg/l the process shall be repeated till it is achieved.

#### ***Chlorination***

During normal operation of the water supply system, water in the distribution network shall be chlorinated (disinfected) to maintain a measured concentration of residual chlorine of not less than 0.2mg/l after 10 minutes of injection.

## **EQUIPMENT AND MATERIALS SPECIFICATIONS**

### ***General***

Generally, equipment and material specifications shall be in accordance with internationally accepted codes and standards, notably, the British or ISO codes and standards. Where necessary, codes and standards accepted by the Sierra Leone Institution of Engineers shall be adopted.

The strength of general construction materials such as cement, iron rods, etc. shall meet specified engineering standards.

**Pumps**

Pumps from reputable manufacturers shall be used in all systems where pumps are required. All pumps shall be provided with the following protection:

- Protection against lightning strike;
- Protection against dry running;
- Protection against pump motor stalling;
- Protection against high pressures in transmission pipe;
- Protection against voltage fluctuations;
- Protection against phase failure;
- Protection against corrosion.

All electrical connections to pumps shall be to the specification of the National Power Authority.

**Pipes**

Pipes to be used in construction shall meet the following requirements.

Pipe Material	Distribution	Transmission
	Min. Pressure	Min. Pressure
uPVC	9 bar	15 bar
HDPE	9 bar	15 bar
Galvanised (exposed)	10 bar	16 bar
Galvanised Steel/Ductile Iron (High pressure areas)	To be specified to meet requirements.	

Pipes used should be generally available on the local market.

**Concrete**

Concrete used in civil works shall have the following strengths:

Classification/Grade	Minimum Strength (N/mm <sup>2</sup> )		Maximum aggregate size (mm)	Use
	28 days	7 days		
I	30	20	20	Water tight reinforced structure
II	25	17	20	Support tower, tank foundation, chamber covers, pipe line markers

III	20	14	40	Standpipes, building foundations, chambers, thrust blocks etc.
IV	15	10	40	Blinding

SALWACO Engineers shall ensure that consultants provide adequate supervision of all civil works contracts.

### **Valves**

The following valves shall be provided, where necessary:

- Air valves
- Washouts
- Stop valves
- Pressure reducing valves
- Non-return valves

Other valves may be provided as specified in the design. All valves shall be robust, simple and easy to operate, and shall be provided with adequate anchorage.

Valves provided shall conform to the respective pipe diameters.

### **Meters**

Flow meters shall be provided on all water supply networks. At least one bulk flow meter shall be provided on the pump head. Water meters shall be provided for each draw-off point (i.e. standpipes or private/institutional connections).

Manometers shall be provided on pump heads and at other relevant locations, and shall have a face of 75 mm diameter minimum.

All meters shall be calibrated in S. I. or metric units.

### **Storage Tank**

Storage tanks shall be provided with the following:

- Shut off valve.
- Aluminium access ladder in the tank.
- External ladder.
- Safety cage and valve/rest platform on external ladder for high level tanks.
- Protective handrails (at least 1.2m high) at the top of tanks.
- Water level gauge (calibration in meters).
- Internal waterproof coating.
- Lightning protection.
- Rubber water bars at all joints (where there is a break in construction).
- Ventilation on tank covers (mosquito proof).

All concrete storage tanks shall be tested for water tightness by filling with water for a minimum of three days, during which period drop in water level shall not exceed 3mm/day.

***Chambers***

Chambers shall be provided to house appurtenances on networks. Chambers shall be covered and provided with a gravel base. Chambers shall be sized to provide adequate working space for maintenance.

## **12 APPENDIX: DRAFT GUIDELINES FOR OPERATION AND MAINTENANCE**

### **A. Basic principles**

The O&M arrangements that are instituted for a facility/system has to take into account the general as well as the peculiar needs of the technical components of the system. Additionally, it has to take account of the supporting financial management and administrative arrangements.

### **B. Manuals for Operation and Maintenance**

System specific manuals for the operation and maintenance of all components of the WSS shall be prepared and submitted by the consultants to the community. The required manuals include:

- i) Manuals for operation and maintenance (Administrative, Financial and Technical)
- ii) Manuals for carrying out monitoring of the Water Supply System.

The needed manuals shall be prepared and submitted by the consultants prior to handing over of each WSS. The relevant personnel shall be trained in the effective use of all manuals.

Three (3) copies each, of manuals on all electro-mechanical equipment shall be submitted by respective suppliers to the consultant. The consultant in turn shall make them available to the relevant community and District Council.

### **C. Water Supply**

#### **Point Sources & Piped systems**

For the point sources the WATSAN shall have operational bank accounts that together with their records book should provide the income and expenditure of the point sources. As a minimum the WATSANs should pay for all operational expenditure and minor regular maintenance. Each point source should have an Asset management Plan in place stipulating when the capital replacement is envisage to be replace and the source of funding for that. The DCs/DWSD should be in a position to prepare it in consultation with the WATSANs. This should include capital replacement such as borehole re-developments.

The DCs should endeavour to have spare parts, pump caretakers within easy reach of the WATSANs. The WATSAN shall endeavour to keep records on maintenance, revenue and expenditure.

For small towns' the strategy would be to have all potential small towns provided with improved water supply service. This would be achieved by strengthening the capacity of DCs in sub-project preparation, TAs in the mobilisation of communities for projects.

Further to this the sustainability of the small towns already would be aimed at especially the technical and financial sustainability. Technical and financial audits would be aimed at and regular monitoring through reports from the DCs to the SALWACO shall be required.

#### **D. Technical Operation**

##### **Operation (Technical)**

This involves all routine activities that ensure that the system functions optimally. It follows clear rules and guidelines and covers technical, financial and administrative activities. A sound operation should normally reduce the number and cost of maintenance.

To achieve sound technical operation:

- Facilities must be used at their optimum capacity. Overuse leads to early and costly damage
- Facilities must be used for their assigned purpose

##### **Maintenance**

Maintenance is a critical activity for the sustainability of all civil works, as well as the proper functioning of mechanical and engineering equipment. It is the regular actions/repairs that are carried out to reduce the deterioration and increase the life span of a facility. A Lack of maintenance leads to rapid reduction of the useful life of a facility/equipment.

#### **Technical Components of a Typical Small Town Water Supply System**

The following comprises the components of a small town water system:

##### **Source/facilities**

- Groundwater
- Electro-mechanical equipment for pumping groundwater
- Transmission pipe line to storage tank

##### **Water Treatment facility (surface water-based systems)**

- Slow sand filter

### ***Distribution System***

- Storage tank(s) – primary and secondary tanks
- Distribution pipe lines
- Metered stand pipes
- Valves, washouts and other accessories

### **Some Technical O&M tasks of Piped Water Supply Systems**

#### ***Transmission and Distribution network***

- Every 2 months, operate all devices of the network (stand pipe valves, washout, air release valves etc) and observe their performance
- At least once a year (especially during the dry season) follow the whole network by foot and,

Look along the pipe route to detect any leakage and carry out repairs if necessary;

Look carefully along the pipe route to detect any removal of soil due to erosion. Backfill and compact if necessary;

Check to see if erosion has undermined the foundation of valve chambers. Backfill and compact if necessary;

Check to see if the soil near valves and washouts has been removed by erosion. Backfill and compact if the soil is removed;

Check all manhole and stopcock chamber and clean inside to allow easy handling of the valve;

- Once a year, open washout to flush out dirt in the pipeline, if any;
- Once a year, check the operation of all valves and carry out necessary repairs or replacement of parts;
- At least twice a year, check all visible metallic parts of the network (valves, air valves, water meters etc.) brush and repaint, if necessary.

#### ***Water Reservoir***

- Once a month, check the cleanliness of the water tank. Empty, clean, and fill with pure water, if necessary;
- Once a year, drain tank, clean and inspect. Repair any damage that causes leakage,
- At least twice a year, check or visible metallic parts of the tanks (valves, galvanised pipes, ladders, tank covers etc.),
- Once a year, check the operation of all valves and carry out necessary repairs or replacement of parts

#### ***Water Quality***

- At least, twice in a year conduct comprehensive water quality tests to assure that the water is safe. See Appendix 6

## **O&M Activities for a borehole with electric submersible pump**

### **Daily**

The operator must:

- Operate pump starter
- Open isolating valve
- Check that reading on ammeter is normal; stop pump if electric motor is drawing too much current
- Confirm that water is being delivered

To stop the electric pump:

- Slowly close isolating valve
- Stop pump at control panel
- Report any problem with valves

Recording:

- Note *start* time and *stop* time and record hours run and meter reading in log book

### **Weekly**

- Clean inside of control panel house

### **Yearly – Electric Submersible pump**

- Remove pump and rising main from well and inspect
- Check pipe threads and re-cut corroded or damaged threads
- Replace badly corroded pipes
- Inspect electric cables and check insulation between cables
- Record servicing and maintenance in log book

### **Troubleshooting**

#### ***Deterioration in borehole water quality***

- Remove pump and inspect borehole
- De-silt borehole if required

#### ***Low level cut-out operates regularly***

- Determine if water table is lowering by measuring static water level
- If borehole level has dropped, add more pipes to rising main if the borehole is deep enough (ask specialist to carry out this job)
- If the water level has not dropped, the screen may be blocked and will require cleaning

***Difficulty in operation of electric starter***

- Check fuses and replace if blown
- Check starter contacts and replace if necessary

***Wrong or unstable output voltage***

- Check and replace automatic voltage regulator

Record all significant problems and actions in logbook

**E. Financial**

**Production and Distribution Expenses**

**Production expenses** shall include cost of:

- (1) Staff and casual labour working on production including salaries before Tax, SSF contributions, staff medical expenses, expenses on safety equipment, welfare, etc.
- (2) Chemicals for dosing of water and cleaning of treatment units
- (3) Electricity
- (4) Fuel and lubricants
- (5) Any other production expenses

**Distribution expenses** should include cost of:

- (1) Staff and casual labour working on distribution including:
  - i) Salaries before Tax
  - ii) Social Security contributions
  - iii) Staff medical expenses
  - iv) Expenses on safety equipment
  - v) welfare
  - vi) Others
- (2) Chemicals such as bleaching powder used for cleaning out storage tanks and distribution network pipes, etc.

**Financial & Administrative Supports to O&M activities**

The following activities have to be undertaken by those responsible for financial and administrative functions:

- Procurement (fuel and lubricants, transport, chemicals, stationery, spares etc.)
- Stocks maintenance
- Keeping Books of Accounts
- Maintaining consumer records (meter readings, billings, payments etc.)
- Budgeting
- Tariff setting (to ensure cost recovery)

- Periodic auditing
- Correspondence
- Staff and Welfare matters
- Organisation and reporting of Meetings
- Preparation of financial and administrative reports

## **13 APPENDIX: DRAFT GUIDELINES FOR TARIFF-SETTING AND IMPLEMENTATION**

### **Principles guiding setting up a tariff structure**

Two scenarios of setting a tariff structure for community water supply are defined:

- a) Cost recovery on operations and maintenance only (including minor replacements), in which the tariff per unit of water consumed will only cover the normal costs of operation and maintenance of the water supply system;
- b) Full cost recovery, in which the costs of operation and maintenance as well as the capital cost of the project are taken into account in arriving at the tariff.

The policy of Government is to continue to subsidise the capital cost of rural water supply. Therefore communities will only be required to meet the operating and maintenance costs of the supply, but are also required to set aside monies to undertake normal replacements as they occur.

In respect of community managed water supply systems with significant populations and viable systems (small towns), Water WATSANs are required to include the capital cost in determining their tariffs. This should however recognise any upfront payments made by the community as their initial contributions.

### **Criteria for setting tariffs**

The criteria on which tariffs shall be set include:

- **Economic**  
This recognises that water is a resource that must be harnessed for the benefit of consumers, and requires to be used judiciously to ensure its long-term sustainability. As far as possible the actual cost of producing the water must be charged to consumers.
- **Financial**  
This requires that the managers of the water supply scheme maintain its financial integrity by ensuring that average tariffs cover expenditures on all goods and services and monies are set aside to cover replacements to avoid any breakdowns.
- **Social/public health**  
This recognises that each member of the community should have access to a basic quantity of water to meet the human requirements and ensure adequate hygiene.

- **Service level**

Tariffs should be set to recognise different levels of consumers. In the rural and small town communities' service levels will mostly be on water points and standpipes. The other types of consumers are – individual connections for households, connections to institutions like schools, hospitals and health facilities and connections for commercial use.

- **Efficiency – non-revenue water, collection ratio**

All water supply systems experience losses through leakage in distribution, illegal connections, faulty meters and wastage and water for public uses such as fire fighting. In addition not all water billed can be collected.

In rural and small town systems, with limited distribution networks the incidence of unaccounted-for water is quite low. In addition the system of water vending at standpipes means an almost 100 percent collection. Allowance has to be made for these factors. This may be set between 10-15 per cent of water produced.

### **Responsibility for tariff setting**

The WSDB shall have the responsibility for setting tariffs, and shall exercise this responsibility in consultation with the community. The District Council shall approve all tariffs.

### **Components of Tariff**

The components of the tariff should include the following: -

- 1) All water production expenses
- 2) All distribution expenses
- 3) Routine maintenance and other contracts
- 4) Repair work (by staff and private maintenance contracts).
- 5) Water quality monitoring at plant level
- 6) Tariff collection expenses (up to 20% of total tariff)
- 7) Major rehabilitation/depreciation (as per the rates below):

Boreholes	4% of original cost after it has been adjusted for inflation (design life 25 years).
i) Pumping Equipment	10% of original cost after it has been adjusted for inflation (design life 10 years).
ii) Electrical Works	10% of original cost after it has been adjusted for inflation (design life 10 years).
iii) Pipe and civil works	4% of original cost after it has been adjusted for inflation (design life 25 years)

- 8) Expansion (2% of production and distribution costs)
- 9) Contingency (8% of total (1) – (8))

The portion of the tariff for major rehabilitation shall be invested to add value and safeguard against depreciation.

At the time of project commissioning the community shall maintain an O & M fund of at least 0.5% of the capital cost or six (6) months of operation and maintenance cost of the Water Supply System, whichever is lower.

### **Tariff Collection**

Tariffs for public standpipes may be collected according to the following:

- (a) Per Household
- (b) Per Adult/Person
- (c) Pay as you fetch
- (d) A combination of the above or some other method

For communities above 5,000 the pay as you fetch method is the most sustainable.

Tariffs shall be collected directly from all government institutions.

### **Tariff Amounts for Individual/Institutional Customers**

- (i) The unit rate of tariff (in  $\text{¢}/\text{m}^3$ ) for individuals and non-commercial institutions shall be between 120 and 130% of the normal tariff charged for standpipe customers. That for commercial entities shall be between 140 and 150% of the normal tariff charged for standpipe customers.

The actual amount to be charged shall be based on the unit rate and the meter reading for the month.

- (ii) Connection Fee shall not exceed the tariff rate for 100  $\text{m}^3$  of water for that connection.
- (iii) Payment of a deposit amount to be set by the WATSANB shall be made upon payment of the Connection Fee.
- (iv) Re-connection fee to be paid by defaulting customers shall not exceed 5% of the Connection Fee.

### **Billing and Customer Complaints**

#### ***Billing***

Bills for individual/institutional connections should be according to the standard format of Community Water and Sanitation Agency

***Customer Complaints***

Each WATSAN Board shall establish a clear procedure for receiving and addressing complaints, which shall be known to the entire community. The WATSAN Board shall respect and comply with these procedures. The entire community shall be notified of any changes in the procedures, when they occur.

## **14 APPENDIX: DRAFT GUIDELINES FOR DRINKING WATER QUALITY**

### **STANDARD AND MONITORING**

#### **Preamble**

The monitoring of drinking Water Quality is a requirement to ensure the safety of potable water.

In the light of the large numbers of point and piped sources of community water supply being constructed under the National Water and Sanitation Programme, it is necessary that the Ministry of Health meets its obligations in the monitoring of the water quality of all such sources through direct or indirect contracting of regional and national level laboratories by Ministry of Health and Sanitation to provide water quality analysis services and to report to the District Council. In particular, water quality monitoring of water supply systems shall be performed at least twice a year after commissioning Water Quality criteria for design is attached.

A National Water Quality Monitoring programme should be: -

- a) Sustainable
- b) Backed by effective legislation at all levels.

It is essential to prevent or control pollution of existing water resources through formulation of sound environmental policies, and legislation to ensure effective watershed management and thereby impact positively on water quality.

Water Quality Monitoring shall consist mainly of:

- 1) Examination of Drinking Water Supplies through sampling and analysis to reveal pollution at the time when the water sample is taken and examined.
- 2) Topographical examination of the locality of the water supply system - Sanitary Surveys which may reveal potential sources of pollution, which may not be discovered by sampling and examination.

#### **Examination of Water Supplies**

The examination and analysis of Water Supplies shall cover three (3) areas of investigation, notably:

- Physico-Chemical
- Bacteriological
- Biological

To carry out these examinations, samples shall be taken and analysed according to standard procedures (SLBS standards).

### **Monitoring Guidelines**

The following are the guidelines for monitoring water quality of Small Towns water supply systems:

1) Water Quality sampling and analysis should be carried out twice annually for each community water supply system. This shall include physico-chemical and bacteriological analysis based on the parameters outlined in the Water Quality Monitoring Form (Appendix 9) for WATSANs once a year.

2) Biological analysis shall be carried out at the intake of systems based on surface waters, and at a frequency to be determined by a qualified Chemist/Bacteriologist at the time of commissioning of the Water Source. The frequency shall not be less than two times a year. Where sanitary surveys reveal a necessity for more frequent examination, this should be carried out.

3) At production plant level, bacteriological and physico-chemical analysis should be made at least once a month for groundwater supplies and once a week for surface water based supplies.

4) Two people per community shall be trained to carry out sanitary surveys. These shall normally be the caretakers of the WATSAN committees and or the operators employed by the WATSANs. They shall record their findings in a standard format to be provided them when they are first trained, and shall send any negative reports through their WATSANs/WSDB to the District Councils/SALWACO regional office (where necessary) for action.

5) Water Quality Sampling and Analysis services shall be performed by recognised institutions, notably MOHS and University of Sierra Leone laboratories and paid for by each community through tariffs.

These institutions shall send copies of reports of annual physico-chemical bacteriological and biological analyses to the District Council for study and

action. A special report shall be made on doubtful sampling results and forwarded to the SALWACO. Regional Water and Sanitation Engineers of the SALWACO shall be required to take relevant action. The final responsibility for action on results of Water Quality Reports lies with the MOHS.

**DRAFT WATER QUALITY CRITERIA**

**Basic Parameters**

<b>Parameter</b>	<b>Units</b>	<b>Proposed</b>
Appearance (Odour & Taste)		Must not be objectionable to most consumers
Colour Hazen (True)	TCU	0 - 15.0
Turbidity	NTU	0 - 5.0
Total Suspended Solids	mg/l	0
Total Dissolved Solids	mg/l	1000
Conductivity	mS/cm	400
PH		6.5 - 8.5
Total Hardness	mg/l	0 - 500
Calcium (Ca)	mg/l	0 - 500
Iron (Fe)	mg/l	0 - 0.3
Manganese (Mn)	mg/l	0 - 0.1
Chloride (Cl)	mg/l	0 - 250
Fluoride (F)	mg/l	0 - 1.5
Nitrite (NO <sub>2</sub> )	mg/l	0 - 3.0
Nitrate (NO <sub>3</sub> )	mg/l	0 - 10.0
Ammonia (NH <sub>3</sub> )	mg/l	0 - 0.5
Sulphate (SO <sub>4</sub> )	mg/l	0 - 250
MPN (Total Coliform/1000ml)		0 - 10.0 (Untreated Supplies)
MPN (Faecal Coliform/100ml)		0

**Supplementary Parameters**

<b>Parameter</b>	<b>Units</b>	<b>Proposed</b>
Lead (Pb)	mg/l	0 - 0.1
Aluminium (Al)	mg/l	0 - 0.2
Sodium (Na)	mg/l	0 - 200
Zinc (Zn)	mg/l	0 - 3
Copper (Cu)	mg/l	0 - 1
Viruses		negligible

**Surface Water - Biological (Parasitological) Quality**

<b>Parameter</b>	<b>Units</b>	<b>Proposed</b>
Pathogenic Protozoa		0
Helminths		0
Free-living organisms		0

**SAMPLE CONSUMPTION CALCULATION**

**EXAMPLE**

Kojo-Krom requires a water supply system. A socio-economist/demographer has undertaken feasibility studies and provided the following information. What is the water demand of the community ten years from today?

Current Population: 10,000

Growth Rate: 2.5%

Industrial and Commercial Demand: 15% of Average Domestic Daily Demand

From the level of urbanization in the town, 80% of the population are expected to use water from standpipes and 20% from house connections.

**SOLUTION**

Current Population	=	10,000
Design Population	= $10,000 \times (1 + 0.025)^{10}$	= 12,800
Daily Domestic Demand	= $12,800 \times [(60 \times 0.2) + (20 \times 0.8)]$	= 358,400 lpd
Daily Inst./Commercial Demand	= $0.15 \times 358,400$	= 53,760 lpd
Losses	= $0.1 \times (358,400 + 53,760)$	= 41,216 lpd
Total Daily Demand	= $358,400 + 53,760 + 41,216$	= 453,376 lpd
Peak Daily Demand	= $453,376 \times 1.2$	= 544,051 lpd
		= 544.1 m <sup>3</sup> /day

## **15 APPENDIX: SAMPLE MEMORANDUM OF UNDERSTANDING BETWEEN DISTRICT COUNCIL AND WATER WATSANS ON THE PAYMENT OF WATER BILLS BY PUBLIC INSTITUTIONS**

### **PREAMBLE**

**Whereas** the ...District Council and the ...Community Water and Sanitation Development WATSANS have entered into a Management Contract dated ... with ...Company for the Operation and Maintenance of the ...Water System within the jurisdiction of the Council.

### **AND**

**Whereas** the Council and WATSANS have covenanted not to interfere with the operations of the Operator

### **AND**

**Whereas** Clause 24.1(b) of the said Management Contract provide as follows:  
“Notwithstanding provisions in this Contract, the WATSANS shall not interfere with the day to day operations of the Operator. In particular the WATSANS shall not:

(b) Issue instructions to the Operator or attempt to influence an Operator’s decision regarding the connection or disconnection of a customer to the water supply system or any lawful action taken by the Operator regarding non-payment by a customer except where the defaulting customer is one of these institutions: the Security Services, Public Schools, and hospitals. In such a situation the WATSANS shall endeavour to ensure payment by these institutions or authorise the Operator to deduct such monies from funds payable to the WATSANS by the Operator

### **NOW THEREFORE**

**THIS AGREEMENT** is made **BETWEEN** the ...District Council (Hereinafter called “The Council) and the ...Water and Sanitation Committees or Boards (Hereinafter called “The WATSANS”) of the one part **AND** ...Company Limited (Hereinafter called “The Operator”) of the other part as follows:

1. The Operator shall not disconnect any of the institutions provided Clause 24.1(b) of the Head Contract or any other institutions provided by the Council and the WATSANS as sensitive institutions within the service area.
2. Where such institutions default or are incapable of paying their bills the Operator shall submit to and demand same from the Council and the

WATSANs and the Council and the WATSANs shall settle the bills within ...days.

3. After the expiration of the ...days, the Operator shall deduct the amount owed from any money payable to the Council or the WATSANs.
4. That in all event the Council and the WATSANs shall endeavour to ensure prompt payment of bills by institutional consumers without prejudice to Clauses 2 and 3 of this Agreement.

**IN WITNESS WHEREOF** the Parties Hereto have set their Hands and Seals on the day and year first above written.

**SIGNED AND SEALED**

For the Council by:

In the presence of:

**SIGNED AND SEALED**

For the WATSANs by:

In the presence of:

## **16 APPENDIX : DRAFT GUIDELINES FOR HAND PUMP MAINTENANCE AND SPARE PARTS PROCUREMENT**

During the IDWSS, a number of Donors and NGOs assisted the GOSL to construct water points equipped with hand pumps.

About 600 water points financed by EU in the Northern province were fitted with PB Mark II hand pumps from Germany. Another 610 drilled wells fitted with Kardia handpumps from Germany were financed in the Bo/Pujehun Districts by KFW/GTZ. JICA also financed 110 drilled wells in the Northern Province. They were fitted with hand pumps from Japan.

To reduce the number of hand pumps and make the procurement, distribution and sale of hand pumps and spares parts a viable business for the private sector, the following guidelines shall be followed: -

- i) The upfront contribution to capital cost by beneficiary communities shall be used to procure a pump together with fast moving spare parts to last at least two years.
- ii) For operation and maintenance, beneficiaries will pay a monthly tariff per household to be determined by the guidelines for setting tariffs.
- iii) The pump maintenance component of the tariff shall be paid into a revolving account to be operated by the WATSANS to procure spare parts.
- iv) The pumps to be installed shall be selected from among one of the three pumps – PB Mark II, Kardia and Inkar.
- v) In each community WATSANS shall select two people (one male and one female) to be trained as Village Pump Caretakers.
- vi) The Village Pump Caretakers will be provided with basic tools for maintenance after their training.
- vii) UNICEF and Donors will assist a suitable private sector supplier in a District to set up a spare parts shop. The modalities for financing the stocks will be agreed among the DCs, UNICEF, Donors and the Private Supplier.
- viii) Spare parts purchased from the shop shall be paid into a revolving account and used to replenish stocks.

## 17 APPENDIX: DRAFT MONITORING AND EVALUATION: SAMPLE FORMATS FOR REPORTING ON OPERATION of COMMUNITY WATER SUPPLY SYSTEMS

**(can be adapted)**

COMMUNITY: .....DISTRICT  
.....

PERIOD OF OPERATION: ..... (Month/year)

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### 1. TECHNICAL

#### 1.1 Water production

Source	Prod. (m <sup>3</sup> /month)	Target (m <sup>3</sup> /month)	Total pumping (hrs/month)	Remarks
Borehole No 1				
Borehole No 2				
Other source(s)				
<i>Total</i>				

#### 1.2. Connections

Type	In service	Out of service	New
Stand post (No.)			
House connection (No.)			
Industrial and commercial connections (No.)			

#### 1.3. Metering

Type	Metered	Un metered
Stand post (No.)		
House connection (No.)		
Industrial and commercial connections (No.)		

#### 1.4 Water quality sampling

Sampling	Source/Bore holes	Distribution	Remarks
Target for sampling			
Samples collected			
% Achieved			

#### 1.5 Maintenance

Description of Maintenance activity	Planned/Unplanned	Remarks

**2.0 FINANCIAL**

**2.1 General**

Report any changes over the previous month in the Remarks column)

<b>Parameter</b>	<b>Amount</b>	<b>Unit</b>	<b>Remarks</b>
Tariff at standpipe per 18 l bucket		Leone	
Vendors commission		%	
Tariff for private connection for 0-...m3		Leone / m <sup>3</sup>	
Tariff for private connection for ..... (indicate if structure varies)		Leone / m <sup>3</sup>	
Connection fee		Leone	
Meter fee		Leone	
Disconnection fee		Leone	
Other (specify)		Leone	

**2.2 Income**

<b>Income source</b>	<b>Active No. within period</b>	<b>Amount billed (Leone)</b>	<b>Amount Collected (Leone)</b>
Standpipe			
Private connection			
New connection			
Disconnection			
Meter fee			
<i>Deposits</i>			
<i>Others, specify</i>			
<b>Total</b>			

**2.3 Expenditure**

<b>Item</b>	<b>Budgeted (Leone)</b>	<b>Actual Amount (Leone)</b>	<b>Variance (Leone)</b>
Salaries and wages			
Electricity			
Vendors commission			
Administration			
Transport			
Maintenance and renewals			
<b>Other, specify</b>			
<b>Total</b>			

**2.4 Payments/Lodgements into various accounts**

<b>Type of account</b>	<b>Year to date</b>	<b>Current month</b>	<b>Cum. Payments</b>
Asset Replacement account			
Sanitation account			
Other			

**3.0 CUSTOMER AND ORGANISATIONAL**

**3.1 Customer complaints**

Description of complaint	No of complaints	Days to resolve complaints

**3.2 Human resources report**

Description	No of staff
Management	
Operations	
Others (security, etc )	
<b>Total</b>	

**3.3 General remarks**

.....

.....

.....

**4.0 SUMMARY (200.... year to date)**

Item	Cumulative to end of last month	Current month	Cumulative up to current month (period)
Revenue			
Expenditure			
Net Revenue (Expend.)			

**FOR ANNUAL REPORTS (WATER WATSANSS AND PRIVATE OPERATORS)**

The annual report should be a summary of all the monthly operations. However, a few other things should be added. These are indicated in the check list below:

Checklist for the annual report

**A: Efficiency, Coverage, accessibility**

*Have you indicated?*

- the target for the various parameters (billing, collection, production etc.) and whether these are being met?
- population not covered i.e. population that is located more than 200 meters from a safe source?
- water availability – continuity of service?
- planned and achieved capital expenditures?

**B: Community relations**

*Have you discussed/reported on?*

- consultations with the community – meetings, public forums, tariff adjustments, complaints?
- any agitations from any section or members of the community against the WATSANs Board, operator etc. and how these were resolved?
- any serious disease outbreaks e.g. cholera, guinea worm etc. which were directly related to water supply?

**C: Monitoring**

*Have you reported on?*

- Visits made to the community (water supply system) by officials of the District Council, SALWACO, other?
- Have you had a technical audit of the water facilities carried out (every 2 years) – to determine the use of the assets, borehole yield, etc.?

**FOR ANNUAL REPORTS (DISTRICT COUNCIL AND SALWACO)**

- The reports submitted should be studied in great detail. These should always be acknowledged so that the WATSAN Board or the operator knows that they are not wasting their energies and resources submitting these reports.
- Comments and any follow-up actions should be quickly communicated to the WATSAN Board.
- The Dc should not hesitate to send a financial audit team to do periodic checks to check on the numbers submitted
- SALWACO should institute periodic checks on water quality and should immediately follow-up where there are warning signals
- It will be appropriate for representatives of the DC and SALWACO to sit in public forums when reports on stewardship and operations of the private operator are being presented.
- It will be a good incentive for the DC/SALWACO to institute annual award schemes for *the Best Water WATSANs and Best Operator* (under clearly defined criteria)

