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LIBERIA

MONROVIA EXPANSION AND REHABILITATION OF THREE COUNTY CAPITALS WATER SUPPLY AND SANITATION PROJECT

APPRAISAL REPORT

AFRICAN WATER FACILITY

December 2007

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CURRENCY

Currency Used	:	United States of America Dollar (USD)
1 EUR	:	USD 1.36

LIST OF ABBREVIATIONS AND ACRONYMS.

ADB(F)	African Development Bank (Fund)
AWF	African Water Facility
DFID	Department for International Development
EC	European Commission
GOL	Government of Liberia
KFW	Kreditanstalt fur Wiederaufbu
LWSC	Liberia Water and Sewerage Corporation
MLME	Ministry of Land, Mines and Energy
PPF	Project Preparation Facility
RWSSP	Rural Water Supply and Sanitation Program
UA	Unit of Account
UK	United Kingdom
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USD	United States Dollar
WATSAN	Water Supply and Sanitation

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Logical Framework

HIERARCHY of OBJECTIVES,	EXPECTED RESULTS	REACH BENEFICIARIES	PERFORMANCE INDICATORS, SOURCE, PERIODICITY	INDICATIVE TARGETS and TIMEFRAME	RISKS , MITIGATION MEASURES
GOAL : To increase accessibility to safe drinking water supply and basic sanitation facilities	**IMPACT:** • Improved water and sanitation services • Increased productivity of population in the four towns	• The population of the four towns • Water service providers	**Indicators**: %of population served with WSS services **Source**: Baseline data collected under the study and Government statistical bulletins and economic reports.	- Coverage of safe water from current 22% and basic sanitation from current 15% increased to 45% by year 2010 and to 100% by year 2025. Achieving the National MDG target for 2010	• Continued government support and priority for WSS sector. • Commitment of all stakeholders to the project objectives
OBJECTIVES: To prepare economically and technically sound priority project for the Monrovia and three towns and mobilize adequate resources for implementation.	**OUTCOMES:** • Adequate resources mobilized based on the reports, designs and documents validated by the Government of Liberia, for reliable and affordable WSS services to the Monrovia and 3 county towns population.	• The population at large • Water service providers • Water related institutions in the country • Water professionals	**Indicators**: % of resources mobilized/resources requirements **Source**: Donors meeting report and amounts pledged. Progress reports. **Periodicity**: Quarterly & Annual review	All feasibility , design and tender document prepared by the end of February 2009	Consultant may not delivery good quality reports on time Closer supervision by PIU
ACTIVITIES • Assessment of the existing conditions in the project areas • Conduct feasibility study • Conduct geotechnical investigations • Conduct water quality studies • Undertake detail design, tender documents and cost estimates • Organize 3 workshops and a Resource Mobilization Conference	**OUTPUTS** • Feasibility report • Detail design and engineering report • Tender documents and cost estimates • Financing plan • Workshop reports • Resources Mobilization Conference report on amounts pledged by donors	• Consultants • L:WSC Staff • Other service providers	**Indicators**: • Approval of grant • Engagement of Consultants ; • Geotechnical investigations • Water quality monitoring **Source**: Project reports Periodicity: quarterly	Grant approval Jan 08 Consultant mobilization – June 08 -Geotechnical investigation – Sept -07 WQ monitoring-July-Oct 08	Government provides its financial , human resources and logistical requirements in a timely manner

EXECUTIVE SUMMARY

1. The purpose of the Water Supply and Sanitation for Monrovia and the three county capitals Project is to a) study economically, technically, environmentally and socially viable water supply and sanitation systems to meet 2025 demands in Monrovia and three county capitals of Kakata, Zwedru and Buchanan, where the Liberia Water and Sewerage Corporation is responsible for services production, and b) develop water sources, abstraction, water conveyance and transmission, water treatment facilities, water distribution network, and sanitation facilities in Metropolitan Monrovia, Kakata, Zwedru and Buchanan as well as efficient water metering and billing systems utilizing appropriate, affordable and least cost technology, and c) mobilize adequate resources for LWSC to implement the expansion and rehabilitation of the WSS systems.

2. The project is to undertake three stage studies consisting of: Stage 1: Feasibility study; Stage 2: Detailed designs for the study area WSS systems, engineering and preparation of tender documents; and Stage 3: Resource Mobilization.

3. The project will contribute towards alleviation of poverty in the study areas through the provision of clean and affordable and sustainable water and sanitation services and also supports in promoting more efficient use of available WSS services. The project is consistent with the country's MDGs Action Plan for water and sanitation, the Interim Poverty Reduction Strategy (IPRS) and in line with the Government policy of rehabilitating infrastructure and utilities for urban dwellers in Liberia on priority basis. Monrovia, Kakata, Zwedru and Buchanan have been selected for the study, because their WSS infrastructure needs urgent rehabilitation, replacements and extensions, since during the civil war infrastructure has not been properly maintained, and in addition, suffered severe damages.

4. The outcomes of the project will consist of adequate resources mobilized based on proposals and designs for water supply and sanitation facilities, which will, when implemented, provide reliable services for the people in Monrovia (1,500,000 people) , Kakata (25,000 people), Zwedru (10,000 people) and Buchanan (35,000 people). This in turn will have a multiplier effect on health and productivity of the people, and will subsequently support poverty reduction efforts on the national level.

5. The project outputs include but not limited to the following:

- Feasibility study comprising of a thorough evaluation of alternative schemes for the various units and operations of the proposed investment project.
- Detailed designs for the study area WSS systems and tender documents with engineering analysis ,designs , construction drawings, specifications ; bills of quantities, conditions of tender and contract documents along with detailed cost estimates; and
- Donors' meeting for mobilizing resources for the investment project. The donors' meeting will be organized after finalization of the study in order to solicit funding for the proposed investment project.

6. The estimated cost of the project, net of taxes and duties, is Euro 1.6 million, of which Euro 1.216 million is in foreign exchange and the remaining 0.384 million is in local cost. The costs are based on recent studies in Liberia and other countries in the region. A provision of about 8% of the study's base cost has been considered to cover physical contingency. AWF will finance 95 % of the project while remaining 5 % will be a Government's in kind contribution in the form of office accommodation.

7. In order to successfully implement the project, the Steering Committee which has already been constituted for the Monrovia Water Supply and Sanitation Immediate Rehabilitation Program will also guide this proposed study. The Steering Committee is chaired by the Minister of Public Works or his representative and consists of representatives of the Ministers of Lands, Mines and Energy, Finance, Managing Director of LWSC, Member of Engineering Society, a local NGO, a representative from the private sector and is hosted by the LWSC/PT, serving as a secretariat. The role of the Committee is to monitor, and provide policy and general managerial guidance and advocacy during the project execution. The Committee will sit every quarter to review implementation plans, project progress and any problems encountered, in order to offer advice and suggestions to enhance smooth implementation of the project.

8. The LWSC as the Executing Agency will be responsible for project implementation. The Project Team (PT) set up for Monrovia Water Supply and Sanitation Immediate Rehabilitation Project will also be responsible for the study. The PT comprises of the Deputy Managing Director for Technical Services of LWSC, the Study Manager assisted by Technical Services Manager and Chief Accountant. The PT will be responsible to coordinate all the day-to-day business of the project monitoring and management.

9. The total implementation period of the project will be 16 months after Grant approval. The Consultant shall complete all work within a maximum period of 11 months from the receipt of notice to proceed including mobilization period and the time required for review and approval of the submissions.

10. Procurement arrangement for the project will be through shortlist at international level. LWSC shall prepare a shortlist of qualified and experienced consultancy firms. The recruitment process including the shortlist of the consultants and evaluation of proposals will be the responsibility of LWSC, which shall forward the shortlist, the required documents, and the results of the evaluation to the Bank for approval. The following documents will be prepared by LWSC for approval by the Bank:

    - Shortlist of consultancy firms;
    - Request For Proposals (RFPs) to the consultants;
    - Proposals evaluation reports; and
    - Contract negotiations and draft contract agreements.

12. It is recommended that a grant not exceeding EUR 1.52 million from the African Water Facility resources be extended to Liberia in order to carry out the study.

13. The opening of a Special Account in a Commercial Bank acceptable to the Bank and the nomination of a Project Coordinator acceptable to the Bank are the conditions for first disbursement.

1 BACKGROUND

1.1 Project Rationale and Origin

1.1.1 Liberia is a West African Country located between longitude $7^0$30' and $11^0$30' west and latitude $4^0$18' and $8^0$30' north. It covers a total surface area of about 111,370 sq. km (about 43,506 square miles). The dry land extent is 96,160 sq. km. The surface water area is 15,050 sq. km. It borders Sierra Leone to the northwest, Guinea to the north, Cote d'Ivoire to the northeast and east, and the Atlantic Ocean to the south and southwest. Its north-south extent is about 465 km and its Atlantic Ocean coastline is about 520 km long. The terrain comprises mostly of flat to rolling coastal plains, rising to rolling plateau and low mountains in the northeast. The coastline is characterized by lagoons, mangrove swamps, and river-deposited sandbars. The country can be divided according to elevation into four main physical regions parallel to the coast: (i) coastal plains up to 100 m; ii) hills from 100 to 300 m; iii) plateaus from 300 to 600 m; and iv) mountainous areas above 600 m. The cultivated area was estimated at 600,000 ha (in 2002), of which arable land covers 380,000 ha, while 220,000 ha are covered by permanent crops.

1.1.2 Liberia's climate is tropical hot-humid. Winters are dry with hot days and cool to cold nights; summers are wet and cloudy with frequent heavy showers. The rainy season lasts from April to November and average annual rainfall is estimated at 2,391 mm, with a spatial variation from 2,000 to 5,000 mm. Although this is much higher than the quantity of water required for crop growth, an acute water deficit is experienced during a 3 to 5 month period, particularly in the uplands.

1.1.3 Liberia is presently divided into fifteen (15) major political subdivisions called Counties. The counties with their capitals are: Bomi (Tubmanburg), Margibi(Kakata), Maryland (Harper), Montserrado (Bensonville), Sinoe (Greenville) Nimba (Sanniquellie), Grand Gedeh (Zwedru), Grand Bassa (Buchanaan), Grand CapeMount (Robertsport), Lofa (Voinjama),Bong (Gbarnga), Gbarpolu (Bopolu), Grand kru (Barclayville), River Cess (Cestos), River Gee (Fishtown). Each of these subdivisions is headed by a superintendent who serves as the vice juror to the President of Liberia. Each superintendent is assisted by an assistant superintendent concerned with the development aspect of the political subdivision. There are sixteen (16) major ethnic groups or tribes in Liberia.

1.1.4 Total population in 2004 was estimated to be about 3.5 million, of which 52 percent were rural inhabitants and 48 percent living in urban, per-urban and small towns' environment. Urban areas constitute densely populated non-agricultural based economy with population in excess of 5000; most towns are county capitals serving both as political, commercial and business centres. The population distribution pattern in the country is highly uneven, Montserrado county accounts for over 25% of the population, Nimba 15%, Baong and Lofa 12%. The national average population density was 78 inhabitants per square mile in 2002. Counties which exceeded the national population density are Montserrado, Baong and Nimba.

1.1.5 Before the Liberian Civil Crisis, 35% of Liberians had access to safe drinking water supply and 27% to adequate sanitation. Today, it is estimated that only 17% has access to safe drinking water and 7% to adequate sanitation. The capital of the country, Monrovia, had 700,000 inhabitants, which received 18 million gallons a day of pipe borne water supply. Today, the city has 1.5 million inhabitants, but only 1.4 million gallons of pipe borne water supply.

1.1.6 Liberia had GDP per capita of income of USD 191.5 or GDP of USD 380.9 million in 2005. It is one of the poorest countries in the world. More than 80% of the people live below the poverty line, less than one USD per person per day. Liberia also faces the chronic problem of unemployment that reaches 85% at the present time. There is a growing body of evidence that suggests that Child mortality rate is about 194 for males and 198 for females per 1000 live births. Life expectancy at birth is 47.7 years and the crude adult mortality rate is 590 for males and 484 for females per 1000. Adult Literacy rate is 50% for men and only 26% for women. Net elementary school enrolment is 34.7 %. The national health statistics indicated that the access to health services is 69.4%, and the prevalence of HIV/AIDS is 10-12%.

1.1.7 Waterborne diseases, including malaria and worms, are most common among people because of the use of unsafe water sources and inadequate domestic and public sanitation facilities. The sanitation condition is very poor throughout the country, as pit latrines and bush/river serve as the main toilet types, imposing health problems especially where densities of population are high. The problem is further compounded with the looting and destruction of public infrastructure during the prolonged civil war that resulted in massive internal displacement and migration of population. This has been particularly severe in urban settlements like Monrovia, Kakata, Zwedru and Buchanan, where the WSS infrastructures is rendered useless.

1.1.8 The Government of Liberia is committed to address the deteriorating situation of water supply and sanitation facilities all over the country, particularly in urban areas and small towns, where the problems are chronic and pronounced.

1.1.9 Following the GOL request for AWF support for conducting water supply and sanitation study through a letter dated 30 October 2006. The Bank's appraisal mission was undertaken from June 22-July 6, 2007. This report is a result of the mission.

1.2 Sector Priorities

1.2.1 The Liberian Government is committed to address the huge tasks facing the water sector on priority basis, but has very limited resources available for water budget. Water sector institutions are not sufficiently organized at the national and county levels. Only the LWSC provides rudimentary services, even this responsibility is limited to Monrovia. The LWSC has very limited capacity, in terms of qualified manpower, resources, facilities and services, to carry out its present responsibility of providing WSS service. At present manpower numbering 171, most of them are technicians engaged in operational activities and general service works. There are only 15 professionals including two qualified engineers and one hydro-geologist, 4 economists, and 8 accountants.

1.2.2 During the war, the water and sanitation facilities were substantially damaged and are now in sever state of disrepair. At present, Metro Monrovia, which has approximately 1.5 million inhabitants, including the internally displaced, receives only 7,500 m3/day (2 million US gallon/day). The majority of the population in Liberia, mostly clustered in urban and peri-urban surroundings have access to water from unprotected water wells, streams or springs. Sanitation is limited to damaged/failed latrines (household, neighborhood, public and open defecation in most cases). In Monrovia the dilapidated water and sewerage works are almost out of use except for few connections in the central district. As a result of the accumulated problems WSS development is accorded a high priority in the Country Interim Poverty reduction strategy (IPRS).

1.2.3 As a post- conflict country with devastated water infrastructure across the nation, and more pronounced in the urban areas and small towns, the chronic and acute shortage of WSS facilities has resulted in a sporadic outbreak of water related diseases like cholera, culminating in high level of morbidity and heavy burden on health facilities. As such the government gives high priority to the rehabilitation of WSS facilities in the immediate future.

1.3 Problem definition

1.3.1 General

1.3.1.1 Before the civil war, about 45% of the urban population had access to drinking water from improved sources, compared to 23% in the rural population. Eleven urban cities were served with piped water. As a result of civil hostilities, the piped supply of water to urban centers have almost ceased during the years of strife. Unauthorized use of water including theft and leakage was very high as well as the number of illegal connections on the remaining network. In reality, much of the drinking water is delivered by truck to either centralized points of distribution or individual storage tanks. Only small parts of Monrovia currently have piped water supply. The other county centers and small district towns are dependant on neighborhood and family owned hand-dug wells, provided by NGOs like Oxfam, Tear Fund, Concern, ICRC and ESAs like UNDP and UNICEF. Except for Monrovia, most of the towns were not served with conventional sewerage system.

1.3.1.2 Poor Water Service and High Unaccounted-For-Water (UFW): Water supply services are characterized by interruptions and wide fluctuations due to breakdowns and due to long time periods before corrective maintenance and repairs are carried out. The situation is exacerbated by high UFW, amounting to 65-75% of the water production in most of the areas particularly in Monrovia. 80% of the UFW is attributed to leakage and 20% to illegal connections. The high UFW represents a serious constraint on effective service delivery, undermining the limited financial capability of the water utility.

1.3.1.3 Lack of Enabling Environment: Policies and strategies provide the definitive environment in which sustainable development takes place. The absence of policies and strategies in Liberia resulted in stunted and non-sustainable services with minimal benefits. In this transitional stage, activities are focused on implementation of individual projects without the robust enabling environment and planning instruments. The existing institution lack clearly established duties and responsibilities. In addition, there are no coherent coordination mechanisms among different stakeholders; fragmentation and duplication of efforts are common, leading to ambiguities in responsibilities among different entities. There is no water resources ministry and the MLME is now entrusted with water sector regulation. However, the MLME doesn't have fully operational water department, a situation which negatively affects on water resources planning and development. Moreover, LWSC has very little capacity for planning and development and is primarily working as a utility operator, though it has mandates for Water and Sanitation development. In addition, the Authority of Rural Development is being phased out from rural water and sanitation sector, while there is no custodian to take over its responsibilities. The MLME is taking a lead initiative to undertake Water Sector Reform studies incorporating policy, strategy, institutional reforms, capacity building, and investment planning. This initiative has been discussed with the development partners including the ADB, the World Bank, EU and DFID; they have all expressed their willingness to support and complement the initiative, and the MLME requested the AWF to finance it.

1.3.1.4 Human Resources Constraint: The human resources capacity in all organizations, at present, consists of skeletal staffing assigned during the transitional Government mandate. In addition water institutions are poorly resourced. While the situation demands the participation of more engineers and other skilled staff to carry out the reconstruction efforts, the current low salary scale does not attract capable professionals.

1.3.1.5 Low Financial Performance: The current Government budget is very limited amounting to about US$ 200,000 per annum for LWSC. On the other hand high level of arrears has been a chronic problem for a long period of time. This situation is compounded with inadequate tariff and billing and a collection structure with low revenue amounting to 30% of water bills. Under these circumstances, it has been very difficult to operate the systems efficiently and that the weak financial position of LWSC has been aggravated.

1.3.1.6 Monitoring and Evaluation Mechanisms: There is a lack of Monitoring and Evaluation (M&E) mechanism. The Government has also recognized the impact of this shortcoming on sector development and there is a need to develop M&E mechanism on priority basis to be installed in the shortest possible time. This requires work on developing indicators for M&E as well as on the process of information generation, transmission, collection, analysis, storage and dissemination. The Bank through its quarterly supervision missions will support the MLME to put in place M&E mechanisms and practices for the project.

1.3.1.7 Coordination of Donor Interventions: Apart from Donors' own procedures and process for approval, disbursement and procurement, there is a need to set up a mechanism for coordination. The situation is exacerbated by the low Government capacity of implementation, and lack of coordination to utilize common implementation instruments. This is visibly affecting the progress in the much needed rehabilitation of water and sanitation systems in both rural and urban areas. The Bank through its quarterly supervision missions will coordinate with other donors and support the Government to take the lead.

1.3.1.8 Community Participation: At present, there are no well considered plans to engage in community mobilization and promotion efforts aimed at gaining support to current initiatives as well as for dissemination of information. This is especially important for sanitation, which is mostly a household responsibility. Dialogue with the population on design of affordable latrines, maintenance and use is necessary for safeguarding the people's health.

1.3.2 Existing Situation and WATSAN Problems in the Study areas

1.3.2.1 Monrovia

1.3.2.1.1 Metropolitan Monrovia covers 43.2 km, ^{2}constituting 0.07% of the country's total area. Central Monrovia is made up of 9 districts and its environs are made up of 7 districts. The terrain comprises mostly of flat to rolling coastal plains, rising to rolling plateau. The coastline is characterized by lagoons, mangrove swamps, and river-deposited sandbars. Main problems associated with the aquatic environment, are soil erosion, loss of biodiversity, and pollution of coastal waters

from oil residue and raw sewage. Water-borne diseases such as diarrhea, dysentery, cholera and infectious hepatitis are common.

1.3.2.1.2 The Metropolitan Monrovia has a present population of about 1.5 million people; with population density of 34,700 persons/km^2. Monrovia is the administrative and economy capital of Liberia, and Public institutions, commerce and informal sector businesses are the mainstay of the economy in the city. In 1990, Monrovia had 700,000 inhabitants, which received 60,566 m3/day (16 million gallons/day).

1.3.2.1.3 The water service is based on a surface water source system abstracting water from the nearby St Paul's river and undergoing conventional treatment through sedimentation, filtration, and chlorination. After treatment, water is pumped to storage reservoirs, transported by the transmission main, and subsequently distributed to the population through Public stand posts and household connections. Prior to the civil conflict, the average daily water production for the city of Monrovia amounted to 67,651 m3/day (18 MGD). Today, the city has only 9,843 m3/day (2.6 million gallons/day), with frequent interruptions.

1.3.2.1.4 Currently, the Monrovia Water Treatment Plant is functioning 8 hours a day, for about 5 days per week, providing 2 MGD. When Supply from the WTP is interrupted, water supply to Monrovia is augmented through the use of two (2) borehole fitted with submersible pumps. The water treatment plant has a design capacity of 16 million gallons per day with a hydraulic capacity of 24 million gallons per day. At present it is capable of producing only 2MGD and with frequent interruption There are two clear well reservoirs, one is 1 million gallons and the other is 0.5 million gallons.

1.3.2.1.5 There are two main transmission pipe lines (16" and 36"), which are in fairly good condition. The 16" is in operation and the 36" has been tested twice. However, some of the Air Relief Valves, Blowout Valves and Air Gauges need to be replaced or repaired. The distribution network in Monrovia comprises of cast iron, PVC, ductile iron, asbestos cement, and galvanized pipes. At present most of these pipes are out of order especially the galvanized pipes. Due to erosion, most of the pipes are exposed on the surface, which poses danger of uplifting if pressure is increased.

1.3.2.1.6 The existing water borne sewerage system was planned to cover 17% of Monrovia serving major portions of the city down town including Bushrod Island and Sinkor areas. The system comprises 61 Kms of sewers and force mains and 4 pumping stations. The network is connected to a waste stabilization pond, which discharges to the ocean through concrete outfalls. The sewage system covered with overgrowth of weeds and huge accumulation of sludge over the years. As a result, the sewerage network is out of service and the effective capacity of the sewage stabilization ponds has severely been reduced. Similarly, the lagoon covered with overgrowth of weeds and huge accumulation of massive sludge. The outfalls are damaged.

1.3.2.2 The three Towns of Kakata, Zwedru and Buchanan

1.3.2.2.1 The three towns have water supply systems based on groundwater abstraction that were installed in the late seventies and early eighties. At the present time none of them are providing service from the centralized source; all these systems were looted and vandalized during the civil war.

1.3.2.2.2 The boreholes are in poor condition because of the looting and vandalism that was rampant during the civil war. In the past the abstraction capacities of the systems were sufficient to meet the project demands in the design period.

1.3.2.2.3 At present the water services in the towns is provided from nearby streams, and hand dug wells fitted with hand pumps; most were constructed and installed during an emergency relief program in the past 2 years. Many hand pumps appear to be operational, although proper maintenance and operation systems are not in place and services are received free. Most hand pump equipped wells are sunk within residential areas. In addition, there are a large number of traditional open hand dug wells.

1.3.2.3 Buchanan

1.3.2.3.1 Buchanan, the capital of Bassa County, is located in the coastal plain of the Atlantic ocean, located approximately 100 kilometers southeast of Monrovia. The town is situated between the Benson River and the former LAMCO Railway. Today Buchanan is a town with less commercial activities than earlier periods when the mining industry was active in the area. Large number of houses are abandoned or destroyed, with the former inhabitants reportedly living abroad. The town has a fully operational hospital. Based on pre war population data, and recent investigations, the current population of Buchanan is estimated to be about 35,000 inhabitants. The town has an approximate area of 14 km^2, with the population density of 24 capita/hectare, which is very low for an African urban center. The town had port facilities which were constructed in 1961, but most installations are looted and vandalized

1.3.2.3.2 Before the war there were more than 50 elementary schools and five high schools, each with up to 100 pupils. Today all schools have less than 300 pupils and no boarding school is in place because of lack of water infrastructure. The major commercial activities which are concentrated along the main road include shops, supermarkets and market stalls. At present there are no functional industries.

1.3.2.3 Kakata

1.3.2.3.1 Kakata, the capital of Margibi County is located in western Liberia, on the asphalted road from Monrovia to Gbranaga, approximately 80 km northeast of Monrovia. The town accommodates the Booker Washington Institute, the Kakata rural Teachers training institute, and a number of church secondary schools. Rubber production, the near –by Bong mines and subsistence rice farming are important features of Kakata's economy.

1.3.2.3.2 Based on pre-war population data and recent investigations the current population of Kakata is estimated to be about 25,000 inhabitants. The inhabited town area is relatively small i.e. 2 km^2, resulting in a population density of about 130 capita/ha, which is high for Liberian secondary towns.

1.3.2.3.3 Kakata is situated on the crossing of the Monrovia- Gbarnga and Bong mines-l Harbel road and is therefore an important market place. However, along the old road, many residential houses are abandoned or destroyed with the former inhabitants reportedly living abroad. Kakata has the Rennie hospital, which is not functional. The hospital has beds and staff, but there are no doctors, no medicines, or proper equipment.

1.3.2.3.4 The town of Kakata is divided into 17 communities, with Mandingo, /Buzzi, central Kakata 1 and 2 being the most populated ones. These communities are along the tarmac main road numerous small enterprises, businesses and restaurants. Local markets can be found in the town center concentrated on a hill, which is surrounded by large valleys, cultivated by the local population or rice plantation. Kakata is expected to grow fast in the next five years, as it is an important commercial center in the region and closely located to Monrovia.

1.3.2.4 Zwedru

1.3.2.4.1 Zwedru is the capital of grand Gedeh County, situated on a hilly region, covered by rain forest, close to the Ivorian border. Before the war the timber industry was mainstay of the economy in the area. The network of roads leading to Zwedru consists of laterite roads, which are difficult to use during rainy season.

1.3.2.4.2 The roads Zwedru- Greenville and Harper are the main traffic connections, as well as the road to Tapeta, from where the capital Monrovia can be reached via the asphalted road from Ganta and Gbarnga. There is a small but fully operational hospital with support from Medicine San Frontiers (MSF).

1.3.2.4.3 Climatically, the area lies between tropical rain forest and savannas with average annual perception of 2000 mm, and dry seasons between November and May. Zwedru is divided into ten communities. The population is mainly concentrated around the market area. The old town represents a low density and low income area. The commercial area is situated along the Dehsuah Street, which provides the basic supplies to the population. Zwedru has currently 10,000 inhabitants. The town is approximately 2.3 km^2, with the corresponding density of about 50 capita/ha.

1.3.2.4.4 Zwedru is expected to grow in the next couple of years, as the growth will be by densifying existing areas inside the current town limits. There are no industrial installations in the town. The institutional facilities like schools, hospitals, religious missions and other government agencies are scattered all over the town. As the population density is so low, a lot of undeveloped spaces are found in communities.

Characteristics of the water supply systems in Monrovia and the three county towns is presented in annex 2. Based on the above, and considering the water requirement of small towns to be about 50 l/c/d, and assuming acceptable functionality of the systems with little O&M problems, the following picture is emerging about the water supply coverage then and now: Monrovia 48, Kakata 64, Zwedru 75, and Buchanan 68 L/c/d respectively. The coverage figures can be summarized as follows :

Water Supply Coverage (%)

No		Prewar	Present
1	Monrovia	96	17
2	Kakata	100	nil
3	Zwedru	100	nil
4	Buchanan	100	nil

1.4 Beneficiaries and Stakeholders

1.4.1 The ultimate beneficiaries are the residents of Metropolitan Monrovia and the three county towns of Kakata, Zwedru and Buchanan, equivalent to about 1.57 million people, majority of whom are poor. Benefits accrued will be primarily in terms of better health, improved productivity of the

working population, also reduction of the burden on health facilities and decrease in the incidence of communicable and water related diseases.

1.4.1.3 The direct beneficiaries are the LWSC/MLME through provision of technical assistance and capacity building and as well as the consultants who will be involved in project design.

2 THE PROJECT

2.1 Purpose

The purpose of the Water Supply and Sanitation Project for Monrovia expansion and the three county capitals rehabilitation is a) to develop economically, technically, environmentally and socially viable water supply and sanitation systems to meet 2025 demands in Monrovia and three county capitals of Kakata, Zwedru and Buchanan, where the Liberia Water and Sewerage Corporation is responsible for services production, and b) to develop water sources, abstraction, water conveyance and transmission, water treatment facilities, water distribution network, and sanitation facilities in Metropolitan Monrovia, Kakata, Zwedru and Buchanan as well as efficient water metering and billing systems utilizing appropriate, affordable and least cost technology.

The study will utilize the existing studies, financed by other donors (the World Bank notably). The study will be executed in three (3) stages consisting of Stage1: Feasibility Study; Stage 2: Detailed Designs for the study area WSS systems, Engineering and Preparation of Tender Documents; and Stage 3: Resources Mobilization, through innovative strategies including advocacy and Donors' conference.

The programme objective is to rehabilitate the Monrovia water and sanitation infrastructure up to 50% and above of pre-war capacity. The programme will also build the immediate capacity of the LWSC to ensure sustainability of the provided facilities and assist the Government in its effort to undertake the necessary reform of the sector including policy formulation, legislation, and capacity building. AfDB, DFID, WB, EC and Government

2.2 Impacts

The proposed investment project resulting from the study will contribute towards alleviation of poverty in the study areas through the provision of clean and sustainable water and sanitation services. The study is consistent with the country's MDGs for water and sanitation, the Interim Poverty Reduction Strategy (IPRS) and in line with the Government policy of rehabilitating infrastructure and utilities for urban dwellers in Liberia on priority basis. LWSC is poorly resourced. With the subsequent investment project from the study, participation of more engineers and other skilled staff to carry out the reconstruction efforts will be enhanced as a result of increased revenues.

2.3 Outcomes

The main outcome of the study is to enable an improved environment for the capital investments, and to mobilize adequate resources for financing water supply and sanitation facilities, that are viable, affordable, and reliable for the people in Monrovia and Kakata, Zwedru and Buchanan.

This in turn will have a multiplier effect on health and productivity of the people and will subsequently support poverty reduction efforts at the national level.

The resultant project from the study will therefore contribute to:

- The achievement of the water MDG's by increasing the access to water from 17 % to 45 % in 2015.
- The achievement of the MDG's related to sanitation by increasing the access to sanitation from 7 % to 30 % in 2015.

2.4 Outputs

The Project outputs include the following:

- Feasibility study with a thorough evaluation of alternative schemes for the various units and operations of the proposed project.
- Adequate solutions for sustainable WSS services.
- Detailed Designs for the study area WSS systems and Tender Documents with engineering designs , construction drawings, specifications, bills of quantities, conditions of tender and contract documents along with details cost estimates;
- A financing plan submitted to and adequate funds pledged by a donor's conference.

2.5 Activities

The Monrovia expansion and 3 County towns rehabilitation Study

This study is the main activity of the Project; it will be conducted by an international consultancy firm through 3 stages as described as following:

Stage 1: Feasibility Study

2.5.1. The feasibility study shall be prepared on the basis of data collection, review and analysis, field investigations and surveys. The study shall make use of all relevant information and data made available from previous study reports, including the study financed by the WB for 3 towns, and carry out additional surveys and studies where necessary for the preparation of the preparation of the new study and various designs. In carrying out this study, the emphasis will be given to population forecast and water supply and demand scenarios, with due recognition to the influx of internally displaced people of the four study areas. A launching workshop will be organized after submission of the inception report one month after commencement of the consultancy.

2.5.2 Special attention shall also be given to conducting proper hydrological and hydro geological field investigations in the study areas to assess and identify alternative water sources and their possible utilization, as main or complementary sources, including surface water, groundwater, as well as rainwater harvesting at household levels.

2.5.3 The feasibility study will identify priority areas of intervention for rehabilitation in the county towns and expansion in Monrovia to satisfy water demand for the year 2025. Preliminary designs of the recommended alternative will be prepared including hydraulic profiles, flow processes, treatment

facilities, physical location of plants, structure and pipe lines, soil investigations, topographical surveys and hydrological and geological investigations in order to define the magnitude and scope, and enable the preparation of the final engineering designs and contract documents. The feasibility study is intended to determine objectively the technical soundness, economic, environmental, social and financial viability of the recommended project. It will also determine and confirm that the proposed facilities represent the least cost solutions. The feasibility study will be reviewed and validated in a national workshop.

Stage 2: Detailed Designs and Tender Documents

2.5..4 The detailed designs and tender documents of the proposed study shall include detailed engineering analysis and designs, construction drawings, specifications, bills of quantities, conditions of tender and contract documents and detailed cost estimates. They will be validated in a national workshop.

Stage 3: Resources Mobilization

2.5.5 A donors' conference will be organized after finalization of the study in order to solicit funding for the subsequent project.

2.5.6 Training: The Consultant will provide a training expert on conducting WATSAN feasibility studies, detailed designs and elaborating tender documents. 3 staff of MLME and 3 staff of LWSC will be trained during 3 weeks, as per 1 week on each above mentioned area. This will forge the capacity of both MLME and LWSC to prepare and procure further WATSAN projects.

2.5.7 The details on the Terms of Reference (TOR) are presented in Annex 6.

2.6 Risks and Assumptions

The possible main risk lies in the managerial, technical and administrative capacity of LWSC with regard to the timely implementation of urban WSS system study. The risk may be in slow down and/or inadequacy in the processing of procurement, financial transaction and implementation activities. The risk will be mitigated by the use of the existing Project Team (PT), further strengthening it, and by the use of Steering Committee to coordinate various sector activities and inputs. The Steering Committee will also provide a broad based guidance and support for the implementation of the study.

2.7 Costs and Financing

2.7.1 The estimated cost of the project, net of taxes and duties, is Euro 1.6 million, of which Euro 1.216 million is in foreign exchange and the remaining 0.384 million is in local currency cost. The costs are based on recent studies in Liberia and other countries in the region. A provision of about 8% of the study's base cost has been considered to cover contingency. A detailed breakdown of the costs is given in Annex 3 and summarized in Table 1 below. The study cost is organized such that consultancy services consist of one study contract including staffing, office, provision for necessary investigations and surveys (hydrology, hydrogeology and water monitoring), workshops and training sessions.

Table 1: Project Cost

Description	Unit	Quant.	Total	FC	LC
A. Key Staff	**m/m**	**52**	**739 000**	**591 200**	**147 800**
B. Support Staff	**m/m**	**114**	**45 060**	**36 048**	**9 012**
C.Reimbursable / Miscellaneous			**534 310**	**427 448**	**106 862**
TOTAL CONSULTANCY SERVICES (A+B+C)			**1 318 370**	**1 054 696**	**263 674**
Project management			**165 400**	**68 320**	**97 080**
Base Cost (A+B+C+D)			**1 483 770**	**1 123 016**	**360 754**
Contingencies	**8%**		**116 230**	**92 984**	**23 246**
TOTAL			**1 600 000**	**1 216 000**	**384 000**
				76,00%	24,00%

2.7.2 AWF will finance 95 % of the project costs covering the costs of the study activities, and the Government of Liberia will contribute 5 % in form of office accommodation. The proposed financing plan is presented in Table 3.

Table 3: Financing Plan

Description	Unit	Qty(F+D)	Total	AWF	GoL
A. Key Staff	**m/m**	**52**	**739 000**	**739 000**	
B. Support Staff	**m/m**	**114**	**45 060**	**45 060**	
C.Reimbursable / Miscellaneous			**534 310**	**534 310**	
TOTAL CONSULTANCY SERVICES (A+B+C)			**1 318 370**	**1 318 370**	
Project management			**165 400**	**85 400**	**80 000**
Base Cost (A+B+C+D)			**1 483 770**	**1 403 770**	**80 000**
Contingencies	**8%**		**116 230**	**116 230**	
TOTAL			**1 600 000**	**1 520 000**	**80 000**
				95,00%	5,00%

2.8 Justification for AWF Financing

The project is considered to be under the AWF operational focus areas of providing support for improved environment for sustainable potable water and sanitation facilities in the study areas. The provision of safe drinking water and basic sanitation will alleviate the problem of epidemics spreading in the study areas. The proposed study will ensure capital investment project quality and enhance viability, and will enable the GOL through organization of a donor's conference to mobilize appropriate resources needed to achieve the national objective in line with the MDGs.

3 PROJECT IMPLEMENTATION

3.1 The Recipient/Executing Agency

3.1.1 The Ministry of Finance is the grant recipient. The Ministry of Lands, Mines and Energy (MLME) is the sector ministry responsible for water and sanitation sector policy, regulation and overall planning. Under the auspices of the MLME, the management and implementation of the water supply and sewerage operations are the responsibility of the Liberia Water and Sewer Corporation (LWSC). The LWSC has gathered and is building steady experience in undertaking development

projects financed by international financial institutions. It will be the Executing Agency for the study. The organization chart of LWSC is given in Annex 4.

3.2 Implementation Arrangements

3.2.1 The LWSC as the Executing Agency shall be responsible for project implementation. The Project Team (PT) set up under the LWSC for Monrovia Water Supply and Sanitation Rehabilitation Program will also be responsible for the study implementation. It should be noted that the Deputy Managing Director for Technical Services LWSC is the Project Manager assisted by Technical Services Manager and Chief Accountant. The PT shall be responsible to coordinate all the day-to-day business of the study monitoring and management. The PT shall be supported by Technical Assistance (TA) provided under the Monrovia Water Supply and Sanitation Program during the entire implementation period. This will be in the form of provision of three (3) experts vis a vis: (i) Water and Sanitation Expert, (ii) Procurement Specialist and (iii) Financial Management Specialist.

3.2.2 A consulting firm will be recruited to perform the study. In order to successfully implement the project, the Steering Committee for Monrovia Water Supply and Sanitation Rehabilitation Program will also guide the study. The steering committee is consists of the Ministers of Lands, Mines and Energy, Finance or their representatives, Managing Director of LWSC, Member of Engineering Society, Local NGO, Representative from Private Sector and is hosted by the LWSC, serving as a secretariat. The role of the Committee is to give advocacy and provide policy and general managerial guidance during the study execution. The Committee will review implementation plans, study progress and any problems encountered, in order to offer advice and suggestions to enhance smooth implementation of the study. The Committee will also review and validate the TOR for the additional studies (hydrology, hydrogeology, water monitoring) before execution by the Consultant, as well as LWSC staff trainings to be conducted by the Consultant.

3.3 Implementation Schedule

3.3.1 The total implementation period of the Project will be 16 months after Grant approval. The Consultant shall complete all work within a maximum period of 10 months from the receipt of Notice to proceed including mobilization period and the time required for review and approval of the submissions. The details of the proposed implementation schedule are given in Annex 5. Target dates for key activities by calendar months are shown in Table 4 below:

Table 4: Implementation Schedule

No	Activity	Time in Months	Responsible Agency
	AWF/ President for Grant Approval	S	AWF
	Grant Signature	S+1	AWF/GOL
	Submission of Shortlist of Consultants and RFP	S+1.0	LWSC
	Approval of shortlist of Consultants and RFP	S+1.5	AWF
	Submission of Proposals	S+3	Consultants
	Approval of Evaluation of Proposals	S+4	LWSC/AWF
	Negotiation and Award of Contract	S+4	LWSC
	Mobilization of Consultants	S+5	Consultants

No	Activity	Time in Months	Responsible Agency
	Reports		
	Inception Report	S+6	Consultants
	1st Workshop	S+7	Consultants/LWSC
	Feasibility Study Report	S+11	Consultants/LWSC
	Environmental and Social Impact Assessment Report	S+11	Consultants/LWSC
	2nd Workshop	S+12	Consultants/ AWF/LWSC
	Detailed Designs Report and Tender Documents	S+15	Consultants/LWSC
	Donors Conference	S+16	Consultants /MLME
	Progress Reports	Quarterly	Consultants/LWSC

3.4 Procurement

3.4.1 Procurement arrangement for the study is summarized in Table 5.

Table 5: Procurement Arrangement (EUR million)

Category	ICB	NCB	Others	International Short List	Total
Consultancy Services Study				(1.43)[1] 1.43	(1.43) 1.43
Project Management			(0.09) 0.17		(0.09) 0.17
Total			(0.09) 0.17	(1.43) 1.43	(1.52) 1.6

1) Note: Figures in the parenthesis are the AFW contributions.

3.4.2 The procurement of the consultancy services shall be through competition among short-listed of qualified international consulting firms according to the ADF Rules of Procedure for the Use of Consultants using the Bank's Standard Request for Proposal (RFPs). The selection of the consulting firm will be based on technical quality of proposals with price consideration.

3.4.3 LWSC shall prepare a shortlist of qualified and experienced international consultancy firms. The recruitment process will be the responsibility of LWSC including the shortlist of the consultants and evaluation of proposals, which will be forwarded to the Bank for approval. The following documents will be prepared by LWSC for approval by the Bank.

- Shortlist of Consultants;
- Request For Proposals (RFPs);
- Proposals evaluation reports; and
- Contract negotiations and draft contract agreements.

3.5 Disbursement Arrangements and Expenditure Schedule

3.5.1 The AWF funds will be disbursed using the Special Account method of disbursement. The LWSC will open a Special Account denominated in foreign currency in a bank acceptable to the AWF. The operation of the account will be the sole responsibility of LWSC. Disbursements of funds will be made on revolving method basis whereby funds will be deposited in the Special Account, and replenished periodically based on the reports on previous expenditures and work planned for the following period. A disbursement schedule based on the activity implementation schedule is presented in Table 6 below.

Table 6: Disbursement Schedule

Source of Financing	**'000 EUR**			
	1st Tranche	**2nd Tranche**	**3rd Tranche**	**Total**
African Water Facility	0.53	0.53	0.46	1.52

3.5.2 Payments will be made to the Consultant based on the wok flow and performance with respect to terms of reference (TOR) of the assignment as shown in Table 7 below:

Table 7: Payment Schedule

	Key Submission	Time from the commencement Date	From the Projet start Months	Payment	Maximum Amount
i)	Down Payment upon submission of Bank Guarantee	At the commencement	S+5	20%	0.286
ii)	Submission of Inception Report	After 2 months	S+7	15%	0.215
iii)	Acceptance of Feasibility Study Report	After 9 months	S+13	35%	0.5
iv)	Acceptance of Detailed Designs Report and Tender Documents and receipt of the Donors Conference Report	After 13 months	S+16	30%	0.429

3.6 Accounting and Audit Arrangements

The AWF will require that a statement of expenditure and supporting documents review be performed and certify by the independent auditor at predetermined intervals to ensure that funds have been utilized in line with the grant agreement. The cost of such audit shall be paid from the AWF operation budget, not from this grant. To expedite the implementation of the study, AWF will recruit and retain an auditor to perform ex post evaluation of supporting documents review and audit the project.

3.7 Monitoring Evaluation and Reporting Arrangement

3.7.1 The plan for monitoring of this project is to check, whether the anticipated activities have taken place, whether the outputs have been delivered with the required quality, and whether the expenditures are in line with the budget. The LF matrix included in this report shall serve as a basis for the result based assessment of the outcomes of the study during implementation monitoring and supervision, and after the completion. AWF's supervision of the study will include regular correspondence with the Recipient, as well as review of the Recipient's Quarterly Progress Reports

(QPR). AWF will consider at any time, as the need may arise, to undertaking field supervision missions.

4 EFFECTIVENESS, EFFICIENCY AND SUSTAINABILITY

4.1 The Steering Committee (SC) will enable effective monitoring, supervision, and provide the requisite policy direction to ensure ownership of all stakeholders who will be involved in the study execution.

4.2 The PT and the Technical Assistance attached with the Monrovia Water Supply and Sanitation Rehabilitation Program will ensure high level professional inputs and provide collective decision making at the implementation level. The institutional structure for study execution will ensure that the PT will have the full authority and autonomy to act without any bureaucratic hindrance and/or interference by other institutions, while on the other hand ensuring coordination and linkages with them through the Steering committee.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

5.1.1 The availability of potable water and sanitation facilities in the project areas is presently limited and this is hampering the economic activities in these areas. The continued lack of water in these areas jeopardizes the peace process currently in place. The non availability of the water and basic sanitation facilities has also been the cause of constant outbreaks of water borne and water related epidemics such as Cholera, Meningitis, Diarrhea and Typhoid Fever with a number of deaths reported. The provision of safe drinking water and basic sanitation will alleviate the problem of epidemics spreading in the study areas.

5.1.2 The study will lead to a project thus helping in reducing poverty, which complies with the Government Strategy for Poverty Reduction. It is also in line with the Bank's Group's policy on Integrated Water Resources Management (IWRM) policy. The study will also support the Bank's water supply and sanitation guidelines towards decentralization, community participation, and cost-recovery principles.

.5.1.3 The proposed project constitutes a major component in the Government's efforts to improve the water supply and sanitation situation and complements the ongoing development activities in Liberia for the attainment of the MDGs. The feasibility study, detailed design and preparation of tender documents will result in an economically and technically sound water supply and sanitation project highly prioritized for Monrovia and rehabilitation of the three county capitals to meet the needs of the population up to year 2025. The project is in line with the Joint ADB/World Bank Interim Strategy Note approved by the Board of Directors on 5 September 2007.

6.2 Recommendations and Conditions

6.2.1 In light of foregoing, it is recommended that a grant not exceeding EUR 1.52 million from the African Water Facility resources be extended to Liberia in order to carry out the study described in the TOR hereto attached.

6.2.2 Establishment of a special account in a commercial bank acceptable to the AWF shall be a condition for first disbursement, as well as the nomination of the project coordinator acceptable to the AWF.

ANNEX 1

MONROVIA EXPANSION AND REHABILITATION OF THREE TOWNS WATER SUPPLY AND SANITATION PROJECT

MAP OF LIBERIA WITH LOCATION OF STUDY AREAS

ANNEX 2

MONROVIA EXPANSION AND REHABILITATION OF THREE TOWNS WATER SUPPLY AND SANITATION PROJECT

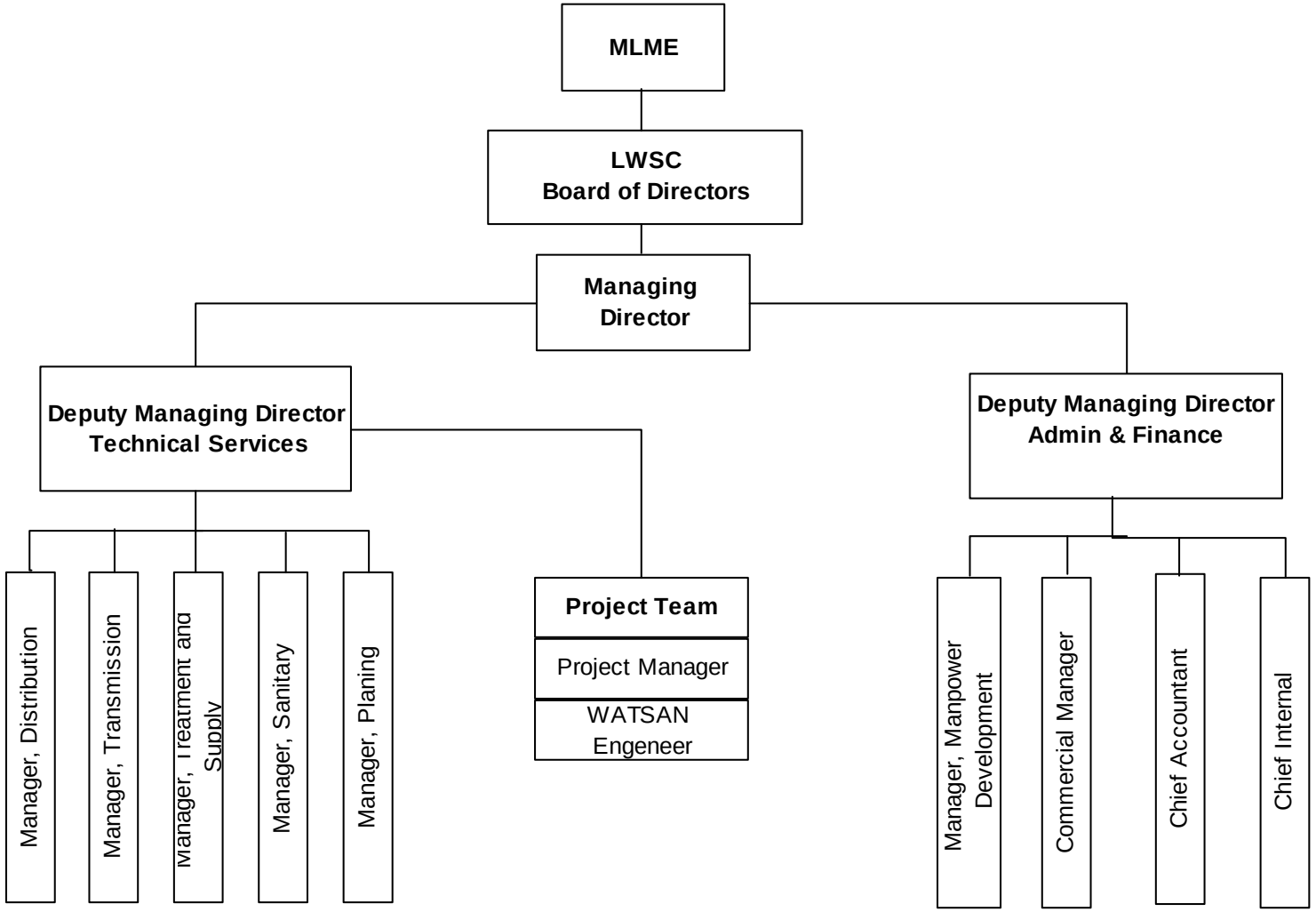
CHARACTERISTICS OF THE WATER FACILITIES IN MONROVIA AND THE THREE TOWNS

No	Description	Unit	Monrovia	Buchanan	Kakata	Zwedru
1	Population (2005)	No	1.5 million	35,000	25,000	12,000
2	Water Source					
2.1	Water source	Type	St Paul river	Groundwater	Groundwater	Groundwater
2.2	Source capacity	m3/d	72,000	2400	1600	900
		MGD	18	0.6	0.4	0.2
2.3	Condition of facility	NA	Looted partly functional	looted	Looted	Partly in use
3	Water Production					
3.15	Production Facility	Type	Treatment plant	Wells	Wells	Wells
3.2	Year of installation	year	1968	1979	1981	1979
3.3	WTP Design Capacity	m3/d	72,000	2400	1600	900
		MGD	18	0.6	0.4	0.2
3.4	Condition of facility	N/A	Partial use	looted	Looted	Looted
4	Storage					
4.1	Storage Facility	Type	Ground reservoir	Water tower	Water tower	Water tower
4.2	Capacity of Storage	m3	4000 +2000	600	450	300
		MG	1+ 0.5	0.6	0.12	0.08
4.3	Condition of Facility	N/A	Poor	Good	Good	Good
5	Distribution					
5.1	Distribution Network	type	CI, GS, PVC	PVC	PVC	PVC
5.2	Year of installation	year	1968	1980	1982	1980
5.3	Length of network (Estimated)	km	Over 200	16	10	15
5.4	NO of connections	no	450 + 150	30	20	20
5.5	Number of estim. PSP	no	22	100	20	20
5.6	Condition of Network		Partial use	Not serviceable	Not serviceable	Not serviceable

ANNEX 3

MONROVIA EXPANSION AND REHABILITATION OF THREE TOWNS WATER SUPPLY AND SANITATION PROJECT

LWSC AND PROJECT MANAGEMENT ORGANIZATION CHART



ANNEX4

MONROVIA EXPANSION AND REHABILITATION OF THREE TOWNS WATER SUPPLY AND SANITATION PROJECT

IMPLEMENTATION SCHEDULE

Activity	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Grant Processing																		
Approval by the President																		
Grant Signature																		
Consultancy Services						1	2	3	4	5	6	7	8	9	10	11		
Preparation of Shortlist of Consultants and RFP and Issuing																		
Submission of Bids by Consultants																		
Evaluation of Proposals																		
Negotiation and Award																		
Consultant Mobilization																		
Draft Feasibility Study																		
Approval of Feasibility Study						W1						W2						
Detailed Design and Tender Documents																		
Approval of Designs and Tender Documents															W3			
Resource Mobilization (Donors Conference)																DC		
Reports																		
Inception Report																		
Progress Reports																		
Feasibility reports																		
Design report																		

ANNEX 5

MONROVIA EXPANSION AND REHABILITATION OF THREE TOWNS WATER SUPPLY AND SANITATION PROJECT
COST ESTIMATES

Description									
	Unit	Qty(F+D)	Unit Cost	Total	FC	LC	Total	AWF	GoL
A. Key Staff									
Project Manager- Water Engineer	m/m	11	16 000	176 000	140 800	35 200	176 000	176 000	
Water and Sanitation Engineer	m/m	10	15 000	150 000	120 000	30 000	150 000	150 000	
Water Resources Engineer	m/m	5	15 000	75 000	60 000	15 000	75 000	75 000	
Environmentalist	m/m	2	13 000	26 000	20 800	5 200	26 000	26 000	
Financial Analyst	m/m	4	13 000	52 000	41 600	10 400	52 000	52 000	
Socio-economist/Gender Specialist	m/m	2	13 000	26 000	20 800	5 200	26 000	26 000	
Institutional Specialist	m/m	2	13 000	26 000	20 800	5 200	26 000	26 000	
WSS Strategist	m/m	3	13 000	39 000	31 200	7 800	39 000	39 000	
Geo-Tech/Struct. Engineer	m/m	2	13 000	26 000	20 800	5 200	26 000	26 000	
Electro-Mechanical Engineer	m/m	2	13 000	26 000	20 800	5 200	26 000	26 000	
Contract Engineer	m/m	3	13 000	39 000	31 200	7 800	39 000	39 000	
Hydrogeologist	m/m	4	13 000	52 000	41 600	10 400	52 000	52 000	
Hydrologist	m/m	2	13 000	26 000	20 800	5 200	26 000	26 000	
Sub-total A		**52**		**739 000**	**591 200**	**147 800**	**739 000**	**739 000**	
B. Support Staff									
Surveyors (4 number)	m/m	12	880	10 560	8 448	2 112	10 560	10 560	
Draughtsman (4 number)	m/m	12	850	10 200	8 160	2 040	10 200	10 200	
Secretary (3 number)	m/m	30	370	11 100	8 880	2 220	11 100	11 100	
Office Assistant (3 Number)	m/m	30	300	9 000	7 200	1 800	9 000	9 000	
Drivers (3 number)	m/m	30	140	4 200	3 360	840	4 200	4 200	
Sub-total B		**114**		**45 060**	**36 048**	**9 012**	**45 060**	**45 060**	
C.Reimbursable / Miscellaneous									
International Travel	unit	18	2 400	43 200	34 560	8 640	43 200	43 200	
Perdiem allowances	day	1560	93	145 080	116 064	29 016	145 080	145 080	
Office Rental	month	10	4 500	45 000	36 000	9 000	45 000	45 000	
Office expenses	month	10	1 000	10 000	8 000	2 000	10 000	10 000	
Office Furniture and Equipment	LS	NA	18 000	18 000	14 400	3 600	18 000	18 000	
Local transport	month	10	3 300	33 000	26 400	6 600	33 000	33 000	
Report production	LS	NA	5 500	5 500	4 400	1 100	5 500	5 500	
Groundwater and Geotechnical Investigations	LS	NA	184 000	184 000	147 200	36 800	184 000	184 000	
Water Quality monitoring	LS	NA	9 000	9 000	7 200	1 800	9 000	9 000	
Workshop	No.	3	6 000	18 000	14 400	3 600	18 000	18 000	
Staff Training (6 persons - 3 weeks) *	LS	1	0	23 530	18 824	4 706	23 530	23 530	
Sub-Total C				**534 310**	**427 448**	**106 862**	**534 310**	**534 310**	
TOTAL CONSULTANCY SERVICES (A+B+C)				**1 318 370**	**1 054 696**	**263 674**	**1 318 370**	**1 318 370**	
Project management									
Project Management Costs*	Month	16	4400	70400	56320	14080	70400	70400	
Accommodation	Month	16	5 000	80 000		80 000	80 000		80 000
Donors Conference	unit	1	15 000	15 000	12 000	3 000	15 000	15 000	
Sub-Total D				**165 400**	**68 320**	**97 080**	**165 400**	**85 400**	**80 000**
Base Cost (A+B+C+D)				**1 483 770**	**1 123 016**	**360 754**	**1 483 770**	**1 403 770**	**80 000**
Contingencies	8%			116 230	92 984	23 246	116 230	116 230	
				1 600 000	**1 216 000**	**384 000**	**1 600 000**	**1 520 000**	**80 000**
TOTAL					76,00%	24,00%		95,00%	5,00%

* See details below

Details of Training and Project Management costs

Description	Training - 3 weeks for 3 MLME and 3 LWSC staff								
	Unit	Qty(F+D)	Unit Cost	Total	FC	LC	Total	AWF	GoL
Trainer	month	1	13 000	13 000	13 000		13 000	13 000	
Perdiem trainer	day	10	93	930		930	930	930	
Air ticket	unit	1	2 400	2 400	2 400		2 400	2 400	
Training Material	LS	6	150	900	720	180	900	900	
Per diem 6 staff	unit	90	70	6 300		6 300	6 300	6 300	
Total cost Staff Training	**LS**	**1**		**23 530**	**18 824**	**4 706**	**23 530**	**23 530**	

Description	PROJECT MANAGEMENT COSTS								
	Unit	Qty(F+D)	Unit Cost	Total	FC	LC	Total	AWF	GoL
Project manager	month	16	800	12 800		12 800	12 800	12 800	
WASTSAN Engeneer	month	16	600	9 600		9 600	9 600	9 600	
Project Accountant	month	16	450	7 200		7 200	7 200	7 200	
Secretary	month	16	200	3 200		3 200	3 200	3 200	
Driver/Messenger	month	16	150	2 400		2 400	2 400	2 400	
Office running costs, consumables	LS	16	1 500	24 000	12 000	12 000	24 000	24 000	
Per diem	unit	160	70	11 200		11 200	11 200	11 200	
Total project management costs	1			70 400	56 320	14 080	70 400	70 400	
Total project management costs	**Month**	**16**	**4 400**	**70 400**	**56 320**	**14 080**	**70 400**	**70 400**	

Cost Preparation Phase

Description	PREPARATION PHASE (5 MONTHS)								
	Unit	Qty(F+D)	Unit Cost	Total	FC	LC	Total	AWF	GoL
A. Key Staff									
Project Manager- Water Engineer	m/m	0,5	16 000	8 000	6 400	1 600	8 000	8 000	
Sub-total A		**0,5**		**8 000**	**6 400**	**1 600**	**8 000**	**8 000**	
B. Support Staff									
Sub-total B		**0**		**0**	**0**	**0**	**0**	**0**	
C.Reimbursable / Miscellaneous									
International Travel	unit	1	2 400	2 400	1 920	480	2 400	2 400	
Perdiem allowances	day	15	93	1 395	1 116	279	1 395	1 395	
Office Furniture and Equipment	LS	NA	18 000	18 000	14 400	3 600	18 000	18 000	
Sub-Total C				**21 795**	**17 436**	**4 359**	**21 795**	**21 795**	
TOTAL CONSULTANCY SERVICES (A+B+C)				**29 795**	**23 836**	**5 959**	**29 795**	**29 795**	
Project management									
Project Management Costs*	Month	5	4400	22000	17 600	4 400	22 000	22 000	
Accommodation	Month	5	5 000	25 000		25 000	25 000		25 000
Sub-Total D				**47 000**	**17 600**	**29 400**	**47 000**	**22 000**	**25 000**
Base Cost (A+B+C+D)				**76 795**	**41 436**	**35 359**	**76 795**	**51 795**	**25 000**
Contingencies	7%			5 376	4 301	1 075	5 376	5 376	
				82 171	**45 737**	**36 434**	**82 171**	**57 171**	**25 000**
TOTAL					55,66%	44,34%		69,58%	30,42%

Cost Phase 1 – Feasibility Study

Description	PHASE 1 (7 MONTHS) FEASIBILITY STUDY								
	Unit	Qty(F+D)	Unit Cost	Total	FC	LC	Total	AWF	GoL
A. Key Staff									
Project Manager- Water Engineer	m/m	7	16 000	112 000	89 600	22 400	112 000	112 000	
Water and Sanitation Engineer	m/m	7	15 000	105 000	84 000	21 000	105 000	105 000	
Water Resources Engineer	m/m	5	15 000	75 000	60 000	15 000	75 000	75 000	
Environmentalist	m/m	2	13 000	26 000	20 800	5 200	26 000	26 000	
Financial Analyst	m/m	4	13 000	52 000	41 600	10 400	52 000	52 000	
Socio-economist/Gender Specialist	m/m	2	13 000	26 000	20 800	5 200	26 000	26 000	
Institutional Specialist	m/m	2	13 000	26 000	20 800	5 200	26 000	26 000	
WSS Strategist	m/m	3	13 000	39 000	31 200	7 800	39 000	39 000	
Geo-Tech/Struct. Engineer	m/m	1	13 000	13 000	10 400	2 600	13 000	13 000	
Electro-Mechanical Engineer	m/m	1	13 000	13 000	10 400	2 600	13 000	13 000	
Hydrogeologist	m/m	4	13 000	52 000	41 600	10 400	52 000	52 000	
Hydrologist	m/m	2	13 000	26 000	20 800	5 200	26 000	26 000	
Sub-total A		**40**		**565 000**	**452 000**	**113 000**	**565 000**	**565 000**	
B. Support Staff									
Surveyors (4 number)	m/m	12	880	10 560	8 448	2 112	10 560	10 560	
Draughtsman (4 number)	m/m	12	850	10 200	8 160	2 040	10 200	10 200	
Secretary (3 number)	m/m	21	370	7 770	6 216	1 554	7 770	7 770	
Office Assistant (3 Number)	m/m	21	300	6 300	5 040	1 260	6 300	6 300	
Drivers (3 number)	m/m	21	140	2 940	2 352	588	2 940	2 940	
Sub-total B		**87**		**37 770**	**30 216**	**7 554**	**37 770**	**37 770**	
C.Reimbursable / Miscellaneous									
International Travel	unit	11	2 400	26 400	21 120	5 280	26 400	26 400	
Perdiem allowances	day	1200	93	111 600	89 280	22 320	111 600	111 600	
Office Rental	month	7	4 500	31 500	25 200	6 300	31 500	31 500	
Office expenses	month	7	1 000	7 000	5 600	1 400	7 000	7 000	
Local transport	month	7	3 300	23 100	18 480	4 620	23 100	23 100	
Report production	LS	NA	5 500	5 500	4 400	1 100	5 500	5 500	
Groundwater and Geotechnical Investigations	LS	NA	184 000	184 000	147 200	36 800	184 000	184 000	
Water Quality monitoring	LS	NA	9 000	9 000	7 200	1 800	9 000	9 000	
Workshop	No.	2	6 000	12 000	9 600	2 400	12 000	12 000	
Staff Training (6 persons - 3 weeks) *	LS	1	0	23 530	18 824	4 706	23 530	23 530	
Sub-Total C				**433 630**	**346 904**	**86 726**	**433 630**	**433 630**	
TOTAL CONSULTANCY SERVICES (A+B+C)				**1 036 400**	**829 120**	**207 280**	**1 036 400**	**1 036 400**	
Project management									
Project Management Costs*	Month	7	4400	30800	24 640	6 160	30 800	30 800	
Accommodation	Month	7	5 000	35 000		35 000	35 000		35 000
Sub-Total D				**65 800**	**24 640**	**41 160**	**65 800**	**30 800**	**35 000**
Base Cost (A+B+C+D)				**1 102 200**	**853 760**	**248 440**	**1 102 200**	**1 067 200**	**35 000**
Contingencies	8%			88 176	70 541	17 635	88 176	88 176	
				1 190 376	**924 301**	**266 075**	**1 190 376**	**1 155 376**	**35 000**
TOTAL					77,65%	22,35%		97,06%	2,94%

Cost Phase 2 – Detail designs and Tender documents

Description	PHASE 2 DETAILED DESIGN (3 MONTHS)								
	Unit	Qty(F+D)	Unit Cost	Total	FC	LC	Total	AWF	GoL
A. Key Staff									
Project Manager- Water Engineer	m/m	3	16 000	48 000	38 400	9 600	48 000	48 000	
Water and Sanitation Engineer	m/m	3	15 000	45 000	36 000	9 000	45 000	45 000	
Geo-Tech/Struct. Engineer	m/m	1	13 000	13 000	10 400	2 600	13 000	13 000	
Electro-Mechanical Engineer	m/m	1	13 000	13 000	10 400	2 600	13 000	13 000	
Contract Engineer	m/m	3	13 000	39 000	31 200	7 800	39 000	39 000	
Sub-total A		**11**		**158 000**	**126 400**	**31 600**	**158 000**	**158 000**	
B. Support Staff									
Secretary (3 number)	m/m	9	370	3 330	2 664	666	3 330	3 330	
Office Assistant (3 Number)	m/m	9	300	2 700	2 160	540	2 700	2 700	
Drivers (3 number)	m/m	9	140	1 260	1 008	252	1 260	1 260	
Sub-total B		**27**		**7 290**	**5 832**	**1 458**	**7 290**	**7 290**	
C.Reimbursable / Miscellaneous									
International Travel	unit	5	2 400	12 000	9 600	2 400	12 000	12 000	
Perdiem allowances	day	330	93	30 690	24 552	6 138	30 690	30 690	
Office Rental	month	3	4 500	13 500	10 800	2 700	13 500	13 500	
Office expenses	month	3	1 000	3 000	2 400	600	3 000	3 000	
Local transport	month	3	3 300	9 900	7 920	1 980	9 900	9 900	
Workshop	No.	1	6 000	6 000	4 800	1 200	6 000	6 000	
Sub-Total C				**75 090**	**60 072**	**15 018**	**75 090**	**75 090**	
TOTAL CONSULTANCY SERVICES (A+B+C)				**240 380**	**192 304**	**48 076**	**240 380**	**240 380**	
Project management									
Project Management Costs*	Month	3	4400	13200	10 560	2 640	13 200	13 200	
Accommodation	Month	3	5 000	15 000		15 000	15 000		15 000
Sub-Total D				**28 200**	**10 560**	**17 640**	**28 200**	**13 200**	**15 000**
Base Cost (A+B+C+D)				**268 580**	**202 864**	**65 716**	**268 580**	**253 580**	**15 000**
Contingencies	7%			18 801	15 040	3 760	18 801	18 801	
				287 381	**217 904**	**69 476**	**287 381**	**272 381**	**15 000**
TOTAL					75,82%	24,18%		94,78%	5,22%

Cost Phase 3 – Resource Mobilization Conference

Description	PHASE 3 DONORS CONFERENCE (1 MONTHS)								
	Unit	Qty(F+D)	Unit Cost	Total	FC	LC	Total	AWF	GoL
A. Key Staff									
Project Manager- Water Engineer	m/m	0,5	16 000	8 000	6 400	1 600	8 000	8 000	
Sub-total A		**0,5**		**8 000**	**6 400**	**1 600**	**8 000**	**8 000**	
B. Support Staff									
Sub-total B		**0**		**0**	**0**	**0**	**0**	**0**	
C.Reimbursable / Miscellaneous									
International Travel	unit	1	2 400	2 400	1 920	480	2 400	2 400	
Perdiem allowances	day	15	93	1 395	1 116	279	1 395	1 395	
Sub-Total C				**3 795**	**3 036**	**759**	**3 795**	**3 795**	
TOTAL CONSULTANCY SERVICES (A+B+C)				**11 795**	**9 436**	**2 359**	**11 795**	**11 795**	
Project management									
Project Management Costs*	Month	1	4400	4400	3520	880	4400	4400	
Accommodation	Month	1	5 000	5 000		5 000	5 000		5 000
Donors Conference	unit	1	15 000	15 000	12 000	3 000	15 000	15 000	
Sub-Total D				**24 400**	**15 520**	**8 880**	**24 400**	**19 400**	**5 000**
Base Cost (A+B+C+D)				**36 195**	**24 956**	**11 239**	**36 195**	**31 195**	**5 000**
Contingencies	11%			3 878	3 102	776	3 878	3 878	
				40 073	**28 058**	**12 015**	**40 073**	**35 073**	**5 000**
TOTAL					70,02%	29,98%		87,52%	12,48%

ANNEX 5

MONROVIA EXPANSION AND REHABILITATION OF THREE TOWNS WATER SUPPLY AND SANITATION PROJECT

STUDY TERMS OF REFERENCE

1. BACKGROUND

1.1 Study Rationale and Origin

1.1.1 Liberia is a West African Country located between longitude $7^0$30' and $11^0$30' west and latitude $4^0$18' and $8^0$30' north. It covers a total surface area of about 111,370 sq. km (about 43,506 square miles). The dry land extent is 96,160 sq. km or 37,570 sq. miles. The surface water area is 15,050 sq. km. It borders Sierra Leone to the northwest, Guinea to the north, Cote d'Ivoire to the northeast and east, and the Atlantic Ocean to the south and southwest. Its north-south extent is about 465 km and its Atlantic Ocean coastline is about 520 km long. The terrain comprises mostly of flat to rolling coastal plains, rising to rolling plateau and low mountains in the northeast. The coastline is characterized by lagoons, mangrove swamps, and river-deposited sandbars. The country can be divided according to elevation into four main physical regions parallel to the coast: (i) coastal plains up to 100 m; ii) hills from 100 to 300 m; iii) plateaus from 300 to 600 m; and iv) mountainous areas above 600 m. In 2002, the cultivated area was estimated at 600,000 ha, of which arable land covers 380,000 ha, while 220,000 ha are covered by permanent crops.

1.1.2 Liberia's climate is tropical hot-humid. Winters are dry with hot days and cool to cold nights; summers are wet and cloudy with frequent heavy showers. The rainy season lasts from April to November and average annual rainfall is estimated at 2,391 mm, with a spatial variation from 2,000 to 5,000 mm. Although this is much higher than the quantity of water required for crop growth, an acute water deficit is experienced during a 3 to 5 month period, particularly in the uplands.

1.1.3 Liberia is presently divided into fifteen (15) major political subdivisions called Counties. The counties with their capitals are listed hereunder: Bomi (Tubmanburg), Margibi(Kakata), Maryland (Harper), Montserrado (Bensonville), Sinoe (Greenville) Nimba (Sanniquellie), Grand Gedeh (Zwedru), Grand Bassa (Buchanaan), Grand CapeMount (Robertsport), Lofa (Voinjama),Bong (Gbarnga), Gbarpolu (Bopolu), Grand kru (Barclayville), River Cess (Cestos), River Gee (Fishtown). Each of these subdivisions is headed by a superintendent who serves as the vice juror to the President of Liberia. Each superintendent is assisted by an assistant superintendent for development, concerned with the development aspect of the political subdivision. There are sixteen (16) major ethnic groupings in Liberia. These ethnic groupings are referred to as tribes.

1.1.4 Total population in 2004 was estimated to be about 3.5 million, of which 52 percent were rural inhabitants and 48 percent living in urban, per-urban and small towns' environment. Urban areas constitute densely populated non-agricultural based economy with population in excess of 5000; most towns are country capitals serving both as political centres and centres for commerce and business. The population distribution pattern in the country is highly uneven, Montserrado county accounts for over 25% of the population, Nimba 15%, Baong and Lofa 12% The national average population density in 2002 was 78 inhabitants per square mile., Counties which exceeded the national population density are Montserrado, Baong and Nimba .

1.1.5 Before the Liberian Civil Crisis, 35% of Liberians had access to safe drinking water supply and 27% to adequate sanitation. Today, only 17% has access to safe drinking water and 7% to adequate sanitation. In 1990, Monrovia had 700,000 inhabitants, which received 18 million gallons of pipe borne water supply. Today, the city has 1.5 inhabitants but only 1.4 million gallons of pipe borne water supply.

1.1.6 Liberia, had GDP per capita of per capita income of USD 191.5 in 2005 on a GDP of USD 380.9 million; it is one of the poorest countries in the World. A large number of people, more than 80% live below the poverty line, poverty line is defined as an income level of less than one USD per person per day. Liberia also faces the chronic problem of unemployment that reaches 85% at the present time.. There is a growing body of evidence that suggests that Child mortality rate is about 194 for males and198 for females per 1000 live births. Life expectancy at birth is -47.7 years and the crude adult mortality rate is 590 for males and 484 for females per 1000. Adult Literacy rate is 50% for men and only 26% for women. Net Elementary school enrolment is 34.7 %. The national health statistics indicated that the access to health services is 69.4%, and the prevalence of HIV/AIDS is 10-12%.

1.1.7 Waterborne diseases, including malaria and worms, are most common among people because of the use of unsafe water sources and inadequate domestic and public sanitation facilities. The sanitation system is very poor throughout the country, as pit latrines and bush/river serve as the main toilet types, imposing health problems especially where densities of population are high. The problem is further compounded with the looting and destruction of public infrastructure and private property during the prolonged civil war that resulted in massive internal displacement and migration of population. This has been particularly severe in urban settlements like Monrovia, Kakata, Zwedru and Buchanan, where the WSS infrastructures are rendered useless.

1.1.8 The Government of Liberia is very keen to address the deteriorating situation of water supply and sanitation facilities all over the county, of which the problems are chronic and pronounced in urban areas and small towns, where the majority of the population including the internally displaced live and work.

1.1.9 In response to the request of the GOL the ADB fielded a mission in May 2007, to discus the problems and asses the situation on the ground. This Appraisal report for initiating a fast track study for Expansion of Monrovia WSS systems and study for the three towns of Kakata, Zwedru and Buchanan, is the outcome of a second Bank mission in June 2007.

1.2 Objectives of the Study

The purpose of the Water Supply and Sanitation Study for Monrovia and the three county capitals is a) to develop economically, technically, environmentally and socially viable water supply and sanitation systems to meet 2025 demands in Monrovia and three county capitals of Kakata, Zwedru and Buchanan, where the Liberia Water and Sewerage Corporation is responsible for services production, and b) to develop water sources, abstraction, water conveyance and transmission, water treatment facilities, water distribution network, and sanitation facilities in Metropolitan Monrovia, Kakata, Zwedru and Buchanan as well as efficient water metering and billing systems utilizing appropriate, affordable and least cost technology.

The study consists of three stage studies as follows: Stage 1: Feasibility study; Stage 2: Detailed designs for the study area WSS systems, engineering and preparation of tender documents; and Stage 3: Resource Mobilization.

2. STUDY AREAS

2.1 Monrovia

2.1.1 The study will cover Metropolitan Monrovia, which has a present population of about 1.5 million people; with population density of 70,000 persons/$km^{2,}$ Monrovia is the administrative and economy capital of Liberia, and Public institutions, commerce and informal sector businesses are the mainstay of the economy in the city. In 1990, Monrovia had 700,000 inhabitants, which received 60,566 m3/day (16 million gallons/day). Today, the city has only 9,842 m3/day (2.6 million gallons/day), with frequent interruptions. The sewage facilities were, covered with overgrowth of weeds and huge accumulation of sludge over the years. As a result, the sewerage network is out of service and the effective capacity of the sewage lagoon has severely been reduced.

2.1.2 Metropolitan Monrovia covers 43.2 km^2 constituting 0.07% of the country's total area. Central Monrovia is made up of 9 districts and its environs are made up of 7 districts. The terrain comprises mostly of flat to rolling coastal plains, rising to rolling plateau. The coastline is characterized by lagoons, mangrove swamps, and river-deposited sandbars. Main problems associated with the aquatic environment, are soil erosion, loss of biodiversity, and pollution of coastal waters from oil residue and raw sewage. Water-borne diseases such as diarrhea, dysentery, cholera and infectious hepatitis are common.

2.1.3 The immediate beneficiaries from the improved water supply systems will be the entire population of Monrovia, (1.5 million people), majority of whom are poor. The other beneficiaries are the LWSC/MLME through provision of technical assistance and capacity building and consultants/contractors who will be involved in project implementation.

2.2 Buchanan

2.2.1 Buchannan, the capital of Bassa County, is located in the coastal plain of the Atlantic Ocean, located approximately 100 kilometres southeast Monrovia. The town is situated between the Benson River and the former LAMCO Railway Today Buchanan is a town with less commercial activities than earlier periods when the mining industry was active in the area. Large number of houses are abandoned or destroyed, with the former inhabitants reportedly living abroad. The town has a fully operational hospital, based on pre war population data, and recent investigations, the current population of Buchanan is estimated to be about 35,000 inhabitants. The town has an approximate area of 14 KM^2, with the population density of 24 capita /hectare, which is very low for an African urban center. The town had port facilities which was constructed in 1961, but most installation are looted and vandalized

2.2.2 Before the war there were more than 50 elementary schools and five high schools, with up to 100 pupils. Today there are no major institutional any more. All actual schools have less than 300 pupils and no boarding school is in place. The major commercial activities which are concentrated along the main road include shops, supermarkets, market stalls. At present there `are no functional industries.

2.3 Kakata

2.3.1 Kakata, the capital of Margibi County is located in western Liberia, on the asphalted road from Monrovia to Gbranaga, approximately 80 km northeast of Monrovia. The town accommodates the Booker Washington Institute, the Kakata rural Teachers training institute, and a number of church secondary schools. Rubber production, the near –by Bong mines and subsistence rice farming are important features of Kakata's economy.

2.3.2 Based on pre-war population data and recent filed investigations the current population of Kakata is estimated to be about 25,000 inhabitants. The inhabited town area is relatively small ca. 2 km^2, resulting in a population density of about 130 caps/ha, which is high for Liberian secondary towns.

2.3.3 Kakata is situated on the crossing of the Monrovia- Gbarnga and Bong mines-l Harbel road and is therefore an important market place. However, along the old road, many residential houses are abandoned or destroyed. With the former inhabitants reportedly living abroad. Kakata has the Rennie hospital, which is not functional. The hospital has beds and staff, but no doctor, no medicines, or proper equipment.

2.3.4 The town of Kakata is divided into 17 communities, of which Mandingo, /Buzzi, central Kakata 1 and 2 are the most populated ones, along the tarmac main road numerous small enterprises, businesses, restaurants and local markets can be found in the town center is concentrated on a hill, which is surrounded by large valleys, cultivated by the local population or rice plantation. Kakata is expected to grow fasts in the next five years, as it is an important commercial center in the region and closely located to Monrovia.

2.4 Zwedru

2.4.1 Zwedru is the capital of grand Gedeh County, situated on a hilly region, covered by rain forest, close to the Ivorian border. Before the war the timber industry was mainstay of the economy in the area. The network of roads leading to Zwedru consists of laterite roads, which are difficult to use during rainy season.

2.4.2 The roads Zwedru- Greenville and Harper are the main traffic connections, as well as the road to Tapeta, from where the capital Monrovia can be reached via the asphalted road from Ganta and Gbarnga. There is a small but fully operational hospital with support from Medicine san frontiers (MSF)).

2.4.3 Climatically, the area lies between tropical rain forest and savannas with average annual perception of 2000 mm, and dry seasons between November and May. Zwedru is divided into ten communities. The population is mainly concentrated around the market area. The old town represents a low density and low income area. The commercial area is situated along the Dehsuah Street, which provides the basic supplies to the population. Zwedru has currently 10000 inhabitants. The town is approximately 2.3 km^2, with the corresponding density of about 50 capita/ha

2.4.4 Zwedru is expected to grow slowly in the next couple of years, as the growth will be by densifying existing areas inside the current town limits. There are no industrial installations in the town. The institutional facilities like schools, hospitals, religious missions and other government agencies are scattered all over the town. As the population density is so low, a lot of open spaces are found in every community.

3. SCOPE OF SERVICES

Stage 1: Feasibility Study

Development Activities and Existing Facilities

A The study shall collect , collate, review, and analyze existing documents on the water Supply and Sanitation sector of Liberia, Water supply and sanitation situation of the country, on going Government and donor funded initiatives, programs and projects. More specifically analysis shall be made on the overall Enabling Environment of the water Sector in Liberia that includes Policy, Strategy, Legislation and regulation, institutional arrangements, Capacity building investment plans along with constraints, Strengths, Weaknesses, Opportunities and Threats; a SWOT analysis will be carried out as part of this assignment.

B Data shall also be analyzed on national design manuals and standards or the lack of it, including but not limited to design criteria related to water demand and supply, water requirements for different uses, water quality, water transportation, water storages, water structures etc, as presented below,

Design Criteria

1.1 National, Urban and/or Area based standards, specifications and design criteria which are rational, affordable, acceptable, executable and sustainable for the design, installation, implementation, operation, maintenance and inspection of water systems shall be formulated. The chief components and the different standards & design criteria to be developed consist of, codes of standards for:-

- Water supply (disaggregated into urban and/or small towns)
- Sewerage and sanitation (onsite, offsite).
- Water quality management, water conservation and protection.

1.2 In the development of standards different parameters on the different aspects of water use will have to be considered in a range of acceptable qualitative and quantitative values.

1.3 The standards and design criteria are to be based on internationally recognized norms and the socioeconomic, historical, geographical and cultural factors that characterize Liberia and more specifically the project areas. This asks for a blend of what is desired with what is reasonably possible. The following factors comprise some of the important parameters that will have to be further qualified in terms of desirable levels, permissible limits, specifications, minimum and maximum levels etc.

A Water Requirements:-

The rate frequency & amount of water needs are based on disaggregated conditions like urban, small towns, industrial areas residential quarters, climatic zones, level of economy. and include:-

- Consumption rates for drinking, industry, other uses, cattle, institutions, fire fighting and defining the minimum per capita consumption below which the intended benefits may not be derived.

- Environment management water requirements.

B **Service Levels: Including:- (i)** Public stand posts, (ii) Yard connections, (iii) Indoor plumbing, (iv) community bathroom, latrines, (v) Sewerage systems, (vi) Septic tanks, (vii) Hand pumps, (viii) Distribution systems, (ix) On spot uses

C **Types of Service,** specifications, standards & guidelines on the design & installation (including source selection) of:- (i) Shallow wells, (ii) Boreholes, (iii) River, lake intakes, (iv) Reservoirs, (v) Piped systems, (vi) Hand pumps

D **Design Periods: -** For different purposes, appliances & units including: (i) Different types of intakes, (ii) Wells, (iii) Springs, (iv) Galleries, (v) Pumps & electromechanical units, (vi) Piping and other materials, (vii) Distribution systems, (viii) Reservoirs, (ix) Treatment plants, (x) dams & other structures, (xi) Canals

E **Pressure**

- Minimum and maximum pressures at different points at delivery stations, in pipelines, at transition points, for fire fighting and other purposes have to be specified.

- Factors associated with emergency situations like floods, earthquake, and epidemics have to be considered in the design of structure & services.

- Modified standards for poor sections for especially people living in crowded quarters of squatter urban areas (Informal settlements) will also have to be considered.

F **Equipment, Tools, materials and Spare-parts (ETMS):** Standards and Specifications to be developed on the following: (i) Pumps, (ii) Generators, (iii) Other electromechanical equipment, (iv) Tools, (v) Materials, (vi) Water quality management equipment, (vii) Spare-parts

G **Appliances & Fixtures: -** Standards and design criteria to be developed for appliances like, wash basins, toilets, valves, meters, chambers. This will be in terms of:- (i) Specifications, (ii) Cost implications, (iii) Socio-cultural aspects, (iv) Environmental issues, (v) Health issues, (vi) Jointing, (vii) Strength, (viii) Durability, (ix) Support, (x) Service requirements, (xi) Inspection and maintenance, (xii) Capacity, (xii) Safety.

H **Water Supply Systems:-** Standards and design criteria for:- (i) Materials, (ii) Pipes & fitting, (iii) Reservoirs, (iv) Joints, (v) Water quality & preservation of water quality, (vi) Pipe sizing, (vii) Pressures, (viii) Safety, (ix) Water hammer, (x) Working temperatures & pressures, (xi) Accessibility, (xii) Delivery, (xiii) Installation, (xiv) Maintenance & cleaning, (xv) Inspection, (xvi) Testing, (xvii) Commissioning, (xviii) Metering, (xix) Socio cultural considerations, (xx) Wastage & unaccounted for water, (xxi)Losses.

I **Water Quality:-** Standards and criteria for, in terms of health & safety, for: (i) Domestic use, (ii) Industrial use, (iii) Recreational use, n(iv) Effluent, (v) Water bodies, (vi) Socio cultural and religious criteria, (vii) Criteria for source protection, (viii) Criteria for water treatment processes, (ix) Environmental use

J **Structures in WSS:** Standards and design criteria for: (i) Boreholes, (ii) Spring protection, (iii) Shallow wells, (iv) Ponds, (v) Cisterns, (vi) Canals, (vii) Dams, (viii) Reservoirs, (ix) Pit latrines, (x) Cesspools, (xi) Septic tanks

K **Social Cultural:** Standards & criteria for:- (i) Appliance & fixtures, (ii) Water quality, (iii) Location of structures, (iv) Use of materials

L **Environmental Sanitation, Water Safety and Water protection.** The benefits expected from improved WSS facilities cannot be achieved unless the proper care is taken to ensure the safety of water sources, transportation lines, and storage both at home and in reservoirs and other facilities. Towards this the following should be incorporated in the design criteria development process:

- Information and facts on the connection between safe water supplies, environmental sanitation and protection of water sources and outlets
- Develop water protection and conservation guidelines along with enforcing regulatory mechanisms
- Ensure the quality of water supply at any point in the delivery system and in house holds
- Promote safe disposal of waste and sanitation services

M **Construction Management:** Streamlined rules, and procedures shall be developed and implemented for:-

- Project Cycle
- Contract documents preparation, contract negotiations and administration
- Construction quality control, supervision and payment schedules
- Rules for inspection
- framework for recording and reporting of information

1.4 An inventory of all existing water supply and sanitation facilities including water abstraction, treatment pumping storage, transmission distribution and Water quality management shall be meticulously documented, including the situation of all non functioning systems and their state of disrepair. All records, operational data, maps, layouts and drawings of the existing water supply and sanitation facilities shall be collected, compiled and updated. Detailed site investigations to inspect and assess the existing installations of both water supply and sanitation shall be carried out. All available operational data shall be analyzed in order to establish the water quality, capacities and efficiencies of the various units. This shall include hydraulic analysis of the treatment facilities, distribution systems, wells/boreholes, storage reservoirs, etc.

2 Population and Water Demand

2.1 Estimates of present and future population with annual growth rates incorporating the massive influx of internally displaced population into the urban areas of Metropolitan Monrovia and the three study towns shall be worked out in collaboration with the national statistical and Geo-information agency, as well as reference to published data on population increase and change trends. This will include population categories, disaggregated in the central outer and peri-urban areas, settlement pattern, density, growth rate, income, health conditions, analyzed with interpretation of future population size density and settlement patterns covering the project planning horizon of 2025

2.2 Using the population data and the water consumption figures, anticipating increase in consumption due to improved facilities and availability, the current water demand and additional demand upon the completion of the projects for the study areas shall be worked out. The demand shall

be broken down into the various categories of consumptions. These figures shall then be projected over the planning horizon. The same exercise shall be carried out for the sewage flow in Monrovia. The determination of the water consumption should be based on demand and level of services expressed by beneficiaries ensuring that access to the basic water needs is availed to the poor people and communities.

3 Water Resources

3.1 All available data including emerging information from ongoing projects related to both surface and groundwater resources, on the, spatial and temporal variability, quantity, quality, present and planned uses shall be collected. Additional field investigations shall be carried out supplemented with on existing hydro meteorological stations, databanks, hydrogeology databases, activities shall be carried out to take physical measurements random and spot, and hydro geological investigations.

3.2 The surface water, spring and rainwater harvesting sources require a detailed study including data collection and interpretation, hydrological and hydraulic analysis. The data collection will cover meteorological data, rainfall data and stream flow measurements as well as analysis of all related existing studies and reports. The feasibility of these water sources to guarantee a reliable and adequate quantity and quality will be determined. Checking of these requirements will need field surveys together with consultations among the locals about sanitation practices, past droughts and flooding and, a hydrological analysis.

3.3 Groundwater is the main sources of water in the three towns and potential source for Monrovia as well; as such, a potential well field already identified from earlier studies as well as new ones to be assessed during this study, shall be thoroughly analysed for quality, quantity distribution and for sustainable use. In addition feasible mechanisms of management and monitoring of the resource shall be thoroughly studied and established. The recharge of the aquifer systems, as well as the temporal variability of groundwater recharge should be assessed using rainfall data. Thorough field investigations will be carried out, including , but not limited to well logging that will help to crosscheck the geological log built from the cutting analysis and geophysical investigations such as gamma ray or resistively. Also, vertical electrical sounding would be conducted in addition to the utilization of geological and hydrological maps, in order to determine the aquifer geometry. Pumping testing at existing or experimental boreholes sites would also be carried out to estimate the aquifer parameters such as hydraulic conductivity and the storage coefficient. Arial photographs, if these exist, would help in determining the morphological situation, the hard rock geological feature and, the locations for drilling sites.

3.4 The water quality of different sources will be studied and recommendations on appropriate treatment facilities to overcome any problems should be made. For this purpose, the relevant number of water sampling and testing will be carried out. Samples of water will be collected from each source serving the study areas and from other sources identified for use in future. These samples will be transferred for full physical, chemical and bacteriological examinations to a recognized laboratory.

4 Water Supply and Sanitation

4.1 Water supply and demand analysis shall be made to satisfy 2025 year demands both in Monrovia and the three towns. Options of utilizing existing water sources and systems wherever feasible will be carried out. In addition alternative sources shall be investigated to sufficient details to make technical and economic comparisons on the choice of sources and systems. Investigation and analysis shall also be made on type of technology, services levels, use of materials, and incorporating the consensus to be developed from the informed choices of the benefiting communities in the respective towns, for optimal utilization of available water resources on sustainable band reliable basis.

4.2 The choice of technology shall be based on a set of criteria that includes affordability, appropriateness, user friendliness, reliability, efficiency, effectiveness, and ease of operation and maintenance, as well as water quality surveillance, monitoring and control. Technology and service level shall be selected to allow measured steps to improve condition over time.

4.3 For each of the alternatives, cost estimates shall be prepared. The costs shall be broken down into local and foreign costs. The latter shall be net of duties and taxes, which should be shown separately. Physical contingencies and price escalation as well as recurrent costs shall be shown separately in current prices. All alternatives shall be examined and compared in terms of their technical feasibility, financial and economic viability, and their impact on the social and physical environment. The optimum alternative of meeting the water supply and sanitation shall be selected.

4.4 At the feasibility stage, the preliminary designs shall provide adequate details on the proposed project including layout plans, hydraulic profiles and cross-sections of the water sources, reticulation systems and treatment plants. Profiles sections of the trunk and main pipes shall also be presented. For on-site sewerage disposal facilities, dimensioned drawings for typical on-site facility or structure, and where applicable charts for calculation of critical dimensions of the disposal systems shall be prepared. Field surveys and investigations including topographical surveys, hydrological and geological investigations, geotechnical investigations for structural designs and sanitation percolation rate shall be carried out for determination of location and alignment of the various installations, and to allow for more accurate estimates of costs and financial analysis

5 Institutional Analysis

5.1 Review shall be made on the overall policy framework in the context of the Integrated Water Resources Management (IWRM) and provide recommendations on policy enhancement, development of WSS strategy, and Institutional restructuring along with pertinent legislation and Regulation. The work shall incorporate issues on Sector mandates, linkages and coordination vertically, laterally and functionally as well as the expected role of municipal councils in WSS management.

5.2 Review shall be made of the existing Organizational arrangement, cross sectoral coordination and overall performance of the water Sector, dealing with urban, small towns and rural settlements. Institutional arrangements present functions as well strengths and weaknesses shall be investigated on Institutions including, but not limited to LWSC, MLME, MOW, Municipal Authorities, MOH, MOF, Country organizations.

5.3 Review and analyze Private Sector Participation (PSP) options which are available and in the context of LWSC, recommend a feasible option for the running of the Corporation efficiently and effectively.

5.4 Use will be made of the information provided in the pervious studies including the World Bank funded feasibility study for the three towns prepared in 2006. The Consultant shall also examine and review the existing organizational structure of LWSC and evaluate its sufficiency, efficiency and effectiveness for providing adequate services to the public.. Based on his analysis, the Consultant shall propose appropriate organization and management structure, staffing levels and training requirements of LWSC aimed at addressing any deficiencies identified during the assignment. The specific requirements of the study in terms of structure, personnel and training shall be highlighted by the Consultant. The Consultant shall propose the implementation arrangements of the project during its execution and shall specify the number of staff and their expertise who will be required for the execution of the project.

5.5 The **institutional set-up** shall be reviewed as follows:

a) Review the legal and Institutional Framework in which LWSC operates and determine the adequacy and deficiencies.
b) Review the existing organizational structure of Liberia Water and Sewer Corporation (LWSC) and Management and evaluate its sufficiency, efficiency and effectiveness for providing adequate services to the population.
c) Review operating policies and procedures and determine deficiencies and constraints and recommend measures to improve them.
d) Examine Arrears situation of LWSC and recommend means of improving the situation.

6. Financial Analysis

6.1 The Consultant shall prepare detailed financial analysis of LWSC and the Project and determine the financial viability of the Proposed Project.

7. Economic Analysis

7.1 The Consultant shall carry out a detailed economic analysis of the proposed project with the aim of determining its benefits to Liberia. The direct costs and benefits, which will be identified and quantified in the financial analysis, will be converted into their economic values.

8. Social Impact Analysis

8.1 Social Impact Analysis (SIA) is to be based on a mathematical economic model shall be outlined. The methodology to be employed shall quantify externalities and identify segments of society, which will reap the benefits of the project and which, if any, will lose from the implementation of the project. The impacts will be consequently be quantified and measured in monetary terms. The net present value of resource flows worked out for financial and economic will give rise to externalities (social resources flow). The externalities measure the social impact of the project which should be detailed in an annex and summarized.

9. Environmental and Social Impact Assessment (ESIA)

9.1 The assignment of the Consultants is to prepare ESIA with a view of assessing and mitigating the negative impacts that could arise by the implementation of the project in accordance with the Environmental and Social (ESA) policy and format of the Bank. The major points to be considered would generally include:

- Description of the policy, legal and administrative context within which this ESIA is being undertaken and the EAS policy of the ADF and Liberia.
- Description and justification of the proposed project
- Description of the environmental and social conditions

- A thorough assessment of all potential adverse environmental impacts during both construction and operation phases of the proposed additional works, particularly with regard to wastewater disposal. This should also include an assessment of the choice of options

- Recommend feasible and cost-effective measures to prevent or reduce significant impacts to an acceptable level; Estimate the costs of those measures, including the institutional and training requirements to implement them, consider compensation to affected parties, if any, for impacts which cannot be mitigated, and

- Preparation of an environmental and social risk management plan including: an action programme to prevent or reduce negative environmental impacts, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures.

For this purpose, the Consultant shall carry out the following specific tasks:

- Identify and include cost-effective measures to prevent or reduce negative impacts associated with the design proposals;

- Prepare a mitigation program including: activities to prevent or reduce negative environmental/social impacts with due consideration to public awareness on sanitation hygiene;

- Develop a monitoring program, including both compliance and effects monitoring of the project respectively during construction and operation (implementation and performance of the proposed mitigation measures), specifying monitoring procedures and requirements (institutional and budgetary);

- The consultant shall prepare an environmental and social Management plan (ESMP) for the proposed project, details of which is as at the Bank's ESA policy;

- Indicate the modality for execution of the Environmental and Social Management Plan (ESMP);

- Identify institutional needs to implement ESMP; and

- Review the authority and capability of institutions at local, provincial, and national levels and recommend steps to strengthen or expand them so that management and monitoring plans are likely to be implemented. The recommendations may extend to new laws and regulations, new agencies or agency functions, intersectoral arrangements, management procedures and training, staffing, operation and maintenance training, budgeting, and financial support.

With regard to gender issues, the Consultant shall assess solutions envisaged under the project to achieve gender equality; the manner in which women can be involved in the technical and non-technical monitoring of the project implementation; any other aspects considered appropriate by the Consultant (e.g. sanitation awareness campaigns, management of public toilets, etc.).

9.2 Environmental and Social Management Plan (ESMP): In case the proposed project has been allocated environmental category II, only an ESMP will be undertaken for this project. The ESMP shall address the following aspects: Summary of impacts, Description of mitigation measures (including public awareness), description of monitoring program (environmental performance monitoring), Institutional arrangements, Implementation schedule and reporting requirements, and Costs estimates. The Consultant should organize the ESMP according to the following outline: Mitigation management plan, Environmental management and training, Monitoring plan, Inter-agency and public/NGOs involvement. All details will be introduced including mitigating measures (with schedule of implementation, responsible agency, and budget), monitoring plan (with schedule of implementation, responsible agency, and budget), training and other institutional strengthening measures. The Bank's format for an ESMP should be adopted. The ESMP shall be a stand-alone document and the summary of the ESMP shall be included in the ESIA

10. Training

The Consultant will provide a training expert on conducting WATSAN feasibility studies, detailed designs and elaborating tender documents. 3 staff of MLME and 3 staff of LWSC will be trained during 3 weeks, as per 1 week on each above mentioned area. This will forge the capacity of both MLME and LWSC to prepare and procure further WATSAN projects.

Stage 2: Detailed Designs and Tender Documents

1. Detailed designs for the proposed project, based on an acceptable design criteria developed by the consultant and endorsed by the GOL, (details on section -- above) for the project in Monrovia and the three towns shall be prepared to meet 2030 demands. The designs will be underpinned on existing information and emerging data from additional, topographical & geotechnical survey and hydrological and geological investigations carried out during the execution of the study. The salient features and important factors defining the design of the works shall be simplicity of construction, ease of operation and maintenance, affordability, reliability, sustainability, durability, and availability locally of materials and skills.

2. The designs shall include all necessary civil, structural, hydraulic and electro-mechanical processes and elements of the works. All calculations and assumptions shall be clearly documented and presented in the detailed design report. Construction drawings of all elements of the works including reticulation systems and treatment plants shall be, as applicable, prepared giving all dimensions and showing hydraulic profiles, structural details, piping, electrical and mechanical details, equipment, location and any other essential features. In addition, process diagrams showing level of treatment to be achieved at each stage, hydraulic profiles showing conditions for average and peak flows shall be shown for treatment plants. For the pipelines, horizontal and vertical profiles, location of all appurtenances including valves and fittings as well as junctions shall be shown.

3. Bills of quantities and/or schedule of materials as appropriate, based on rigorous and detail quantity takeoffs, shall be prepared followed by detailed cost estimates. The costs shall be broken down into foreign and local costs, and shall be backed up by unit costs for labor, basic materials, clearly showing the source of information. The cost estimates will also allow for escalation of prices, and physical contingencies of each of the two categories. Schedules of expenditure per components and by year also broken down into foreign and local costs shall be prepared.

4. The detail design will incorporate implementation arrangements and schedules, by identifying who will do what where and when as well as the amount of investment necessary, the activities required for procurement as well as the consultative process, including communities. Details of

efficient contracts arrangement with the appropriate packaging, as well as enunciating the roles and responsibilities of the Executing Agency and communities will be required.

5. The final design report will include important features of the design in sufficient detail to allow smooth implementation of the Works, procurement of goods and services. The design report shall be based on the accepted design criteria, a summary of the principal technical considerations that have gone into the design, description of the various components, costs of both capital and recurrent expenditures, implementation schedule, justifications, conclusions and recommendations. The designs shall confirm that the project represents the most technically appropriate and least cost option of meeting sector objectives, and expectations of the beneficiaries.

6. In addition a risk analysis will be carried out comprising identification of factors including weakness, strengths, opportunities and threats with a SWOT analysis and other factors beyond the control of project management that would have an impact on the success of the project at implementation and during operation as well as an estimate of the probability of occurrence and consequences of such factors and recommendation of appropriate mitigating action. A separate detailed TOR and cost estimate for the supervising consultant to ensure smooth implementation of the projects shall be prepared.

7. African Development Bank (ADB) and African Water Facility (AWF) guidelines for the provision of services, works and goods and rules and procedures for engaging consultants as well as for procurement will be utilized. As a result, the tender documents shall be prepared in accordance with the rules, procedures for procurement of the African Development Fund and shall include a summary description of the project works, Instructions to Contractors and Suppliers, Technical Specifications, Contract Drawings and Plans. The drawings shall be to scales, as appropriate, for the intended purposes.

4. REPORT SUBMISSIONS

Mo = Date of contract signature

Inception Report	Mo+1
Progress Reports	Quarterly
Launching Workshop	Mo+1
Feasibility Study Report Environmental and Social Impact Assessment Report	Mo+7
Second Workshop	Mo+7
Detailed Designs Report and Tender Documents	Mo+10
Third Workshop	Mo+10
Donor Conference	Mo+11

5. RESPONSIBILITIES OF THE CONSULTANT AND THE GOVERNMENT

Consultant's Responsibilities

5.1 The Consultant will be fully responsible for the conduct of the Study and will take all necessary steps for smooth implementation of the Study. The Consultant shall exercise all reasonable skill, care and diligence in the performance of services under the Agreement and shall carry out all responsibilities in accordance with recognized professional standards. In the undertaking of the Study, the Consultant shall co-operate fully with the executing agency, LWSC. The Consultant shall also liaise with the counterpart Staff Team to be established as well as with other concerned organizations with a view of collecting new information, ascertaining data, discussing development plans, criteria etc. The Consultant shall take into account relevant comments from LWSC, other relevant Government institutions and the AWF, and shall be responsible for the accuracy of his work, conclusions and recommendations.

Workshops and Donors Conference

The Consultant shall assist the Government to organize 3 workshops and a resources mobilization conference to which all-relevant government agencies, user groups, international and other agencies will be invited. The purpose of the meetings will be to inform those present about the present study, share information, and explain the need to protect water resources from depletion and pollution. The Consultant shall assist in inter-agency co-ordination and public/NGO participation/consultation. In order to ensure acceptability to affected groups, the proposed mitigating measures should be clearly described and justified during the public consultation process.

A launching Workshop will be organized after inception report submission. Two national validation Workshops will be organized after the feasibility study phase (Mo+7) and the detail tender documents phase (M0+10). The Project manager will assist the Government to organize the resources mobilization Conference (Mo+11).

The Consultant shall assist the Government to produce Workshops and Donors Conference reports being available and disseminated maximum 2 weeks after each meeting.

Government's Responsibilities

5.2 The Government shall furnish the Consultant with all available reports on any previous studies, maps and documents pertinent to the proposed work free of charge within a reasonable time.

5.3 The Government shall grant exemption from, or assume liability for the payment of any duties, taxes, royalties or other deductions in respect of salaries, equipment, materials and supplies, which are imported for the purposed work or for personal use and are subsequently re-exported at the end of the assignment. It will also grant the permission to import/re-export reasonable amounts of foreign exchange by the Consultant and members of the Consultant's internationally recruited staff.

4.4 The Government shall facilitate the speedy granting of visas, customs clearance and access to all sites involved in the Study to the Consultant and any of the Consultant's personnel in respect of services to be carried out in Liberia.

4.5 The Government shall assign a project manager and a Water and Sanitation Engineer to the Project Implementation Unit, as well as support staff and equipped office space.

6. ESTIMATED KEY PROFESSIONAL STAFF REQUIREMENTS

The estimated key professional staff requirements are as follows, for a total effort estimated to 52 person/months:

Project Manager
Water and Sanitation Engineer
Environmentalist
Financial Analyst
Socio-economist/Gender Specialist
Institutional Specialist
Geo-Tech/Struct. Engineer
WSS Strategist
Electro-Mechanical Engineer
Contract Engineer
Hydro geologist
Hydrologist