



**AFRICAN DEVELOPMENT
BANK GROUP**

**PROJECT: TRANSFORMING RURAL LIVELIHOODS IN
WESTERN ZAMBIA –NRWSSP PHASE II**

COUNTRY: ZAMBIA

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN SUMMARY

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN SUMMARY

PROJECT TITLE: Transforming Rural Livelihoods in Western Zambia-NRWSSP II

PROGRAM NUMBER: P-ZM-E00-0028

COUNTRY: Zambia

DIVISION: OWAS II

a) Brief description of the project and key environmental and social components

The program ‘Transforming Rural Livelihoods in Western Zambia – NRWSSP Phase II’ aims to provide sustainable access to water supply and sanitation in sixteen (16) rural districts of Western Province namely Kalabo, Mongu, Sesheke, Shangombo, Kaoma, Lukulu, Senanga, Mwandu, Mulobezi, Sioma, Nalolo, Mitete, Luampa, Nkeyema, Limulunga and Sikongo so as to contribute towards poverty alleviation of Zambia’s rural population and also contribute towards achievement of National Vision targets of universal access to water and sanitation services.

The support is part of the broader National Water Supply and Sanitation Program and a continuation of funding from the African Development Bank, the KfW, DANIDA, JICA, UNICEF, among other lenders, for which Phase I is ongoing and coming to a close in December 2014. The proposed program will be implemented over a period of 60 months commencing in 2015.

The project will have four main components namely: (i) Water Supply Infrastructure Development, (ii) Sanitation and Hygiene, (iii) Sector Development activities including Capacity Building and (iv) Program Management.

The water supply component will focus on rehabilitation and new construction of water supply infrastructure. Western Province has one of the lowest access rates for water supply at 49%. It is expected that the support will result in increasing access to 87%. This will entail rehabilitation of 771 boreholes and 472 hand dug wells, construction of 1,231 new boreholes equipped with hand pumps, construction of 10 solar powered water reticulation schemes in the rural district centres and growth points. The program will also undertake construction of 150 manually drilled boreholes equipped with hand pumps to reach the most disadvantaged in the hard to reach locations west of the Zambezi River and construction of 250 hand dug wells equipped with hand pumps. The suitability of point sources for rural water supply varies across Western Province because of factors such as depth of the ground water, the large water level fluctuations in many shallow wells, geology and the occurrence of iron and/or saline groundwater in a number of places. Therefore, a menu of technical options will be promoted, including; (i) manually drilled wells equipped with hand-pump; (ii) boreholes with hand-pump; (iii) boreholes with solar powered submersible pump, storage tank and local reticulation system; (v) hand dug wells equipped with hand pumps, among other low maintenance solutions. Optional additions may include use of an alternative (standard) hand pump with a Polyvinyl Chloride (PVC) plastic/stainless plastic riser, or a compact sand filter to reduce iron and channels/canals to provide irrigated water for domestic crop production.

The sanitation and hygiene component will utilize Community Led Total Sanitation (CLTS) promote Open Defecation Free (ODF) communities, improved household sanitation through sanitation marketing, improved hygiene practice and communal facilities for schools (830), (16) markets and (70) health centres.

Sector development activities will focus on promoting overall sector policies, activities, institutional capacity building and strengthen sector M&E at the national, provincial and district level.

Program Management will make provision for technical support, training, transport and equipment to facilitate smooth and effective program implementation. The component will finance operational and administrative costs as well as technical assistance to the District Councils, Provincial Department of Housing and Infrastructure (P-DHID) and Rural Water Supply and Sanitation Unit (RWSSU) in MLGH.

The objective of the program is to provide sustainable and equitable access to improved water supply and improved sanitation to meet basic needs for improved health and poverty alleviation for Zambia's rural population in Western Province. The program will improve social conditions (e.g., health, education, income generation, empowerment, etc.) and transform communities that are better able to prepare for and respond to a wide range of changing conditions including climate change. The main expected outputs are:

- 745,176 people with access to improved water supply within 500 meters of walking distance through the provision of new and rehabilitation of 2,874 water facilities and 10 solar powered reticulation schemes
- 431,679 people targeted in 16 districts to stop Open Defecation
- 572,658 people sensitized through hygiene education (by gender)
- 83,028 people and pupils benefiting from construction of 900 sanitation units in Schools, health centres and markets.
- 72 schools adopt and practice safe hygiene through awareness campaigns and formation of school committees
- 7000 out patient's access improved sanitation per day through the construction of 70 sanitation units in Health Centres.
- 2874 V-WASHE committees created and trained (+50% women)
- 2874 communities trained in biogas installation and use
- 9 spare parts shops constructed with seed stock spares for water facilities
- 288 Area Pump Menders (APMs) trained (+50% women)
- 60 national, provincial and district staff trained on data collection, quality control, management and gender sensitivity
- 524 APMs trained on data collection process (+50% women)
- Web-based IMS developed and operational
- 16 sanitation demonstration facilities installed
- 16 Bio Digesters constructed in schools

b) Major environmental and social impacts

Positive Impacts: In general, the program will have positive benefits for the rural population. The program will improve health by providing safe, equitable, and sustainable drinking water sources, improving hygienic behaviour and environmental hygiene. The program will in general improve access and use of water points for the target population.

The benefits of the program include a sharp decline in diarrhoea and other water borne diseases (by about 30%) and associated health care costs, improvement of maternal health. Women and girls enjoy dignified sanitation, improved nutrition, fighting HIV/AIDS and dealing with malaria. These benefits will accrue in the form of a gain in productive time due to less time spent on fetching water, health sector and patients costs saved due to less treatment of diarrhoeal diseases, and the value of prevented deaths. Water supply and sanitation have a direct impact on education because:

- time school aged children save from fetching water that is expected to enable them to devote more time to education and
- sanitation facilities allow teenage girls to attend school even during certain periods of the month
- Better health due to clean water supply and sanitation reduces lost school days. In addition, better health reduces lost work days for working-age people and is expected to increase time for income generation.

Negative Impacts: The subprogram components involve mainly new construction and rehabilitation of water points, construction of small scale solar powered water reticulation schemes which is appropriate, low cost technology that do not pose any significant environmental consequences. However, potential adverse environmental and social impacts can occur such as water contamination leading to human health challenges; increased incidence of infectious water-borne diseases such as cholera, non-infectious diseases such as arsenic poisoning, and water-enabled diseases such as malaria, schistosomiasis or bilharzia through:

- ***Contamination of surface and groundwater*** supplies with infectious organisms from human excreta. Contamination may be caused by poorly designed, operated or maintained sanitation facilities.
- ***Infectious diseases*** may also be spread by improper use of wastewater to grow food crops.
- ***Failure to test new sources of water***, especially groundwater, for possible natural or industrial chemical contaminants, such as arsenic, mercury, fluoride and nitrate, can lead to serious health problems.

This can be mitigated by preventing water pollution through design, water testing and hygiene awareness. Adverse impacts to ecosystems Adverse impacts to ecosystems can arise from water diversion, construction or decommissioning activities in or near a watercourse, or from faecal contamination of water. Numerous impacts on ecosystems are possible such as:

- **Construction of water and sanitation facilities in sensitive areas (wetlands, estuaries, etc.)** can destroy flora or fauna or their habitats, leading to loss of biodiversity, reduction of economic productivity and loss of aesthetics and recreational value.

- **Improperly designed water-supply and Sanitation projects** can also deplete fresh water, erode soil from pipe leakage, or create poor drainage at taps. Increased consumption of water can reduce water flows and cause loss of habitat, wetlands and wildlife downstream. Soil erosion may cause sedimentation in receiving waters, which may reduce the capacity of ponds and reservoirs, increase flooding, or substantially alter aquatic ecosystems by changing streambed, lakebed and estuary conditions.
- **Contamination of receiving waters with human excreta** or animal manure can cause nutrient enrichment, depletion of dissolved oxygen and other changes that disturb natural ecosystems and reduce the vigor, abundance, and/or diversity of plants and animals that live in water or on land. Disease-causing microorganisms from excreta may also contaminate fish, creating health hazards.

This can be prevented by proper siting of interventions and avoiding sensitive ecosystems. Depletion of fresh water sources can occur when projects do not adequately assess the quantity of available surface and groundwater (including typical seasonal and annual variations.) Other causes include poor mechanisms for regulating withdrawals and use of water, and insufficient monitoring and maintenance of leaks.

Depletion of surface water sources damages aquatic life, reduces economic productivity, diminishes downstream use, and curtails recreational possibilities.

Overdrawing wells and boreholes can alter groundwater flows; reduce groundwater levels, potentially leading to loss of drinking water sources locally or in downstream or down-hill locations. These losses of source water availability and quality may lead to increased costs if alternative supplies need to be located or if additional treatment is required. Aquifer depletion and falling water tables can also lead to land subsidence (sinking of the land's surface). Both situations would increase the cost of future water supply systems and may strike urban and rural areas. Increased population densities and the lack of facilities can increase the impact in peri-urban areas. In addition, depletion of water resources may lead to poorer water quality, health impacts, and elevated costs of potable water supplies in downstream or down-hill locations.

Other negative impacts include management and disposal of sanitary waste and disposal during operation and increased risk of HIV/AIDs and STDs due to interactions of contractor staff and the local population. In addition, implementation of the program will definitely increase volume of human and motor traffic in the program sites. The increase in human and motor traffic will be aggravated by the transportation of construction materials, water pipes and other equipment required in constructing the program facilities. This is likely to result in a higher risk of accidents and occupational hazards occurring in the area of operation. Factors that may exacerbate this situation are inadequate appropriate working gear for programme workers including the helmets, overalls, boots and gloves. Poor design, operation and/or maintenance of water supply improvements can lead to pools of stagnant water near water points, water pipes and storage tanks. Improper or ineffective practices for disposing of excreta and solid waste can exacerbate this problem. Stagnant water pools form an excellent breeding place for disease vectors (mosquitoes that carry malaria, etc.). They can also increase transmission of water-related diseases, especially when the wet spots are clogged or contaminated with waste or excreta.

Land Acquisition and Resettlement: There will be no displacement of people living in the sub-program areas. However, small parcels of land will be required for the construction of the water points and sanitation facilities and protecting the areas around the water points, while

construction activities could lead to very limited temporal and permanent loss of land and/or crops at sub-programs sites. The communities will select the sites for the facilities. Depending on the type of technology adopted for individual sub-programs, the extent, and likelihood of affecting sensitive areas, an environment and social assessment/review **compliant to Bank's policies and procedures** will be carried out at the design stage of each subprogram. Boreholes will require land measuring approximately 1-2m², and water schemes will require small storage tanks and strips of land for laying distribution pipelines/ channels. The community will contribute land for the facilities as part of their contribution to the Program, in the event that the selected site is on public or community land. It is envisaged that no private land will be encroached on, but if that arises, the program will adopt a willing buyer-willing seller approach to land acquisition. These will be part of the subprogram selection criteria. Screening of all sub programs will be carried out, this will formalize a rapid field investigation to screen on-site whether any environmental and social issues may require specific attention and supplemental Environmental Assessment work. All subprograms (including the (water reticulation schemes) will undergo the screening process in order to avoid any miss in screening potential environmental issues; **and will also be fully compliant with the Bank's policies and procedures.** The District Rural Water Supply and Sanitation Officer based in Mongu and the 15 named districts will duly identify the environment, social issues and other concerns. This will ensure also that the site selection does not cause any involuntary resettlement that would require compensation under AfDB's Policy on Involuntary Resettlement.

Social Impacts: Social impacts are expected to be positive, especially the gender aspects, as women are the key stakeholders for water and sanitation. Increased access to improving access to safe water supply and improved sanitation will lead to more productive livelihoods. Saving time, especially for women and girls, will result in using the time for other beneficial activities and most of which will be in improving livelihood e.g., spare time to go to school; better comfort and better quality of life and domestic hygiene; reduction in water-borne diseases such as dysentery and cholera; and capacity building and training in the community through the formation of Village Water, Sanitation, Hygiene Education committees (V-WASHEs), and resulting enhancement of organizational, financial and technical capacities of communities to better manage their water resources and facilities sustainably.

Construction of water facilities at villages will reduce the long distances to water sources there by giving access to the sick, people with HIV/AIDS, and disabled people as they're unable to cover the distances and end up being depended on other family members. Through the Program special attention will be given to identify the poorest households, and those with elderly, the sick and Female Headed Households to ensure that they have equal access to safe water. The program will help reduce the incidence of water borne diseases and associated high health care costs. The program will also impact positively on the achievement of other MDGs such as reducing extreme poverty and hunger, promoting gender equity and empowerment of women, reducing child mortality, improving maternal health and combating malaria and HIV/AIDS.

Cumulative Impacts: The program will rehabilitate water points such as boreholes and hand dug wells which were constructed in the 80s and 90s and build upon the intervention by DANIDA in the province which saw the development of boreholes. It is expected that there will be significant cumulative impacts as a result of the program. While the intervention by DANIDA had significant impact, access to water supply still remained low and hence Governments decision to

invest in water supply and sanitation with the support of AfDB. In addition, the World Bank funded Strategy Programme for Climate Resilience (SPCR) whose objective is to strengthen Zambia's institutional framework for climate resilience and improve the adaptive capacity of vulnerable communities in the Barotse sub-basin of Western Province will complement the Bank program. It will provide infrastructure initiatives for water management to reduce effects of flooding period, rehabilitate and/or manage canals to provide a more reliable water source for irrigation, reduce the amount of flooded area thus providing more productive land, reduce the amount of time an area is flooded thus allowing for more cropping and provide an easier transport system to access markets. This will significant impacts on the livelihoods of the rural population in the program area.

c) Enhancement and mitigation program

While the program interventions are expected to result in overall environment and public health improvements in Western Province, potential adverse environmental and social impacts can occur if the water supply and sanitation activities are not properly designed, sited, implemented, and maintained. The main potential adverse impacts that may arise from the implementation of the program in Western Province are as follows:

- Human Health Impacts -Water supply and sanitation activities may cause increased incidence of infectious water-borne diseases such as cholera, non-infectious diseases such as arsenic poisoning, and water-enabled diseases such as malaria, schistosomiasis or bilharzia through. The MLGH will ensure that they prevent contamination of surface and groundwater supplies by infectious organisms from human excreta. MLGH will ensure contamination of water sources is prevented through good designs, operation and maintenance of sanitation facilities. MLGH will ensure that new sources of water are tested for quality, especially groundwater, for possible natural or industrial chemical contaminants, such as arsenic, mercury, fluoride and nitrate that can lead to serious health problems.
- Degradation of Ecosystems can arise from water diversion, construction or decommissioning activities in or near a watercourse, or from fecal contamination of water. MLGH will ensure that they prevent construction of water & sanitation facilities in sensitive ecosystem areas (e.g. wetlands, recharge zones, etc.). They will also ensure properly designed water-supply and sanitation projects to prevent depletion of fresh water, erode soil from pipe leakages, or prevent poor drainage at taps. (iii) Depletion of Water Resources can occur when projects do not adequately assess the quantity of available surface and groundwater (including typical seasonal and annual variations.) Other causes include poor mechanisms for regulating withdrawals and use of water, and insufficient monitoring and maintenance of leaks. The MLGH will ensure that they prevent depletion of surface water sources which may damage aquatic life, reduces economic productivity, diminishes downstream use, and curtails recreational possibilities. They will prevent overdrawing of wells and boreholes to prevent alteration of groundwater flow regimes or change groundwater levels leading to loss of drinking water sources locally or in downstream locations.

General environmental protection measures to be taken during planning, design and at any construction work site shall include:

- (a) understanding of the geology, soils, population, and groundwater potential of the project site,

- (b) Survey for, and avoid, wetlands, streams or other ecologically sensitive sites in the project area, identify nearby areas that contain endangered species and get professional assessment of species' sensitivity to construction, assessment of their vulnerability to project intervention if need be, changes to location &/or design are made,
- (c) To minimize the effect of dust on the environment resulting from earth mixing sites, vibrating equipment, construction related traffic on temporary or existing access roads, etc. to ensure safety, health and the protection of workers and communities living in the vicinity of work sites and access roads.
- (d) Ensure that noise levels emanating from machinery, vehicles and noisy construction activities (e.g. excavation, drilling) comply with Zambian standards and are generally kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities.
- (e) Ensure that existing water flow regimes in spring, rivers, streams and other natural or irrigation channels are maintained and/or re-established where they are disrupted due to works being carried out.
- (f) Contractors shall provide mechanisms to protect soils and vegetation from being washed to the rivers during construction.
- (g) Any site affected by the site work will be restored to its initial condition. Topsoil will be stripped ahead of any earthmoving, stored near the construction site, and replaced in its original location after the re-contouring of the area affected by the works. Avoid damaging Vegetation, revegetate areas damaged during construction. Do not remove erosion control measures until revegetation is complete
- (h) Prevent any construction-generated substance, including bitumen, oils, lubricants, effluent and any waste produced during the execution of works, from entering into springs, rivers, streams, boreholes, dams, irrigation channels and other natural water bodies/reservoirs. Use silt screens, straw bales or similar erosion control measures
- (i) Avoid or minimize the occurrence of standing water in holes, trenches, borrow pits, etc.
- (j) Prevent and minimize the impacts of quarrying, earth borrowing, piling and building of temporary construction camps and access roads on the biophysical environment including protected areas and arable lands; local communities and their settlements. Restore/rehabilitate all sites to acceptable standards.
- (k) Upon discovery of graves, cemeteries, cultural sites of any kind, including ancient heritage, relics or anything that might or believed to be of archeological or historical importance during the execution of works, immediately report such findings to the District Council and MLGH so that the Ministry of Chiefs and Traditional Affairs may be expeditiously contacted for fulfillment of the measures aimed at protecting such historical or archaeological resources.
- (l) Prohibit construction workers from engaging in the exploitation of natural resources such as hunting, fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities,
- (m) On water points, monitor drains and soak-ways and keep them clear of debris, monitor and repair leaks from cracked containment structures, broken pipes, faulty valves and similar structures, monitor water levels in wells or impoundment structures to detect overdrawn, ensure that spilled water and rainwater drain to a soak-way or equivalent structure and do not accumulate and create stagnant

- (n) On islands and plain fringes, keep withdrawals within safe yield limits to avoid overdrawing, possible salt water intrusion & contamination of wells
- (o) Include a focus on proper use and maintenance of the improvement as part of the behaviour change & education program and monitor water level,
- (p) Devote adequate attention to identifying and addressing social barriers to using latrine, Use the ventilated improved pit latrine design that traps insect vectors, evaluate depth to water table, including seasonal fluctuations and groundwater hydrology, pit latrines should not be installed where the water table is shallow or where the composition of the overlying deposits make groundwater or an aquifer vulnerable to contamination, ensure that a reliable system for safely emptying latrines and transporting the collected material off-site for treatment is used. Properly decommission pit latrines. Do not leave pits open. Fill in unused capacity with rocks or soil,
- (q) Implement HIV/AIDS awareness through appropriate health promotion as well as wide distribution and use of condoms (for men and women); employment opportunities for programme-affected women; provision of family accommodation for construction workers.

In addition the following enhancement measures are included;

- 288 Area Pump Menders will be trained in hand pump operations and maintenance in addition to maintenance of solar powered schemes, 2874 V-WASHE committees (50% women) will be formed and trained as water point users and 2,900 V-WASHE committee's will be reconstituted and retrained. 745 CLTS champions will be trained (5 per ward) in addition to numerous natural leaders in the communities during district awareness campaigns,
- Districts are expected to carry out follow-ups to ensure the V-WASHE committees are duly active. The capacity will be strengthened of provincial and district level staff on climate informed decision-making and planning for rural water supply and sanitation infrastructure and services, thus minimizing anticipated climate risks on the infrastructure and services and will be implemented in conjunction with the Nordic Development Fund (NDF) who will finance climate change adaptation activities on the program. An estimated 448 persons from Districts will be trained with a maximum of 28 participants per district to include Environmental Health Technicians, Rural Water and Sanitation Officers, Agriculture Extensions Officers, Finance officers, Procurement Officers, Forestry Officers, Community Development Officers, Social Welfare Officers, District Administration, Provincial Engineers and Ward Development Committee members.
- Households and Staff at schools will be trained in biogas installation and use of resultant fertilizer, a byproduct of the biogas production and use. The estimated cost of the ESMP is US \$ 540,000.

Gender Mainstreaming: Specific steps to enhance women's participation in the Program include (i) Gender expert at the national and district levels, currently there is no gender expert at the national and districts level or a mechanism for assessing the impacts; ii) a mechanism for assessing the impacts of program activities on different user groups., iii) the program will review and update the 2000 Gender Mainstreaming strategy; iv) Training in Gender mainstreaming in water supply and sanitation at the Provincial and district levels will be provided and v) Gender audits/gender stocktaking of the rural water supply and sanitation will be undertaken to eventually help the MLGH to measure the impact, achievements, challenges, lessons learned and the way forward. 14,370 women in V-WASHEs, 120 as masons, 30 as artisans and 144 as Area Pump Menders will be trained in the decision-making process including planning of WSS

facilities. The program will improve water supply in communities and provide water closer to homes which will increase girls' free time and boost their school attendance. The program will also address the lack of separate and decent sanitation and washing facilities which normally discourages girls who are menstruating from attending full time, often adding up to a significant proportion of school days missed. Women will have more time to engage in more productive activities.

Youth Participation: It is anticipated that 12,501 jobs will be created during construction of the facilities and the program will promote the participation of youth and women especially in the construction of sanitation facilities.

Climate Change Adaptation Measures: The Bank with co-financing from the Nordic Development Fund (NDF) will improve water and sanitation adaptive capacity of rural communities to withstand climate variability and change. This will be done through (i) development of procedures for integrating Climate Change Adaptation (CCA) measures for rural water supply and sanitation and field-testing of the approaches proposed, (ii) increased capacity to develop and support adoption of water and sanitation climate resilient technologies at provincial, district and community levels and (iii) documentation of challenges and lessons learned. The field testing will cover the following activities: Reforestation and tree planting, 60 household biogas plants, 16 biogas plants at markets and 20 in schools installed, Water Supply provision latrine sanitation, Monitoring systems for ground water and / or early warning and Self-monitoring system of water levels by communities.

As part of the environmental management, the ESMP shall be part of the contract documents. The MLGH will prepare contract-level and site specific ESMPs to facilitate tracking of the contractor's performance in the implementation of the mitigation measures. Also, the TOR for the Program Consultant will specify supervision and monitoring of the contractor's performance as well as reporting in the Implementation Progress Report.

d) Monitoring program and complementary initiatives

The key objectives of monitoring are: (i) Ensure that the ESMP is implemented; (ii) Evaluate the effectiveness of the mitigation measures; (iii) Verification of predicted impacts; and (iv) Provide feedback to ZEMA, the program sponsor (MLGH) and the financier (AfDB).

To ensure social and environmental sustainability of the programme, the MLGH will monitor all the above impacts and ensure that proposed mitigation measures and enhancement of benefits are implemented. The table 1 below shows parameters that will be monitored. MLGH will assume the overall responsibility as program sponsor. They will have a Provincial Engineer who will be supported by through Technical Assistance of the Provincial Support Team (PST) based in Mongu. The PST will have a Water Engineer with hydrology/hydrogeology background and a Social/ Environmental officer on site during construction. Furthermore they will work with Non-Governmental Organizations and Community Based Organizations. Other stakeholders that will be involved include the Local Authorities in Western Province, Zambia Environmental Agency (ZEMA), Ministry of Health, Ministry of Community Development, Mother and Child Health, Ministry of Lands, Environment and Natural Resources, Ministry of Labour, Ministry of Chiefs and Traditional Affairs, Ministry of Mines, Energy and Water Development and the local police.

All parties were part of the finalisation of the ESMP and agreed to the responsibilities assigned and the timeframes. High frequency of monitoring will be during construction with a few activities left to MLGH for post construction.

The key verifiable indicators which will be used to monitor the impacts (depending on the nature, size and scope of the subproject) are presented in **Table 1** below. The Framework Environmental Monitoring Plan for the project is presented in **Table 2**.

Table 1: Key environmental and social monitoring indicators for water supply projects:

Component	Indicators
Environment	
Water	<ul style="list-style-type: none"> Quality of water based on national and WHO Standards Quantity of water used compared to initial estimates
Ecosystem	<ul style="list-style-type: none"> Surface of sensitive areas affected by the project (encroachment, sedimentation on spawning grounds, river banks erosion, etc.)
Population	
Natural Resources and Land Management	<ul style="list-style-type: none"> Number of conflicts among water users (upstream, onsite and downstream). Presence of V-WASHEs including men and women Revenue from water fee or tariff collection and allocation
Quality of Life	<ul style="list-style-type: none"> Level of satisfaction of beneficiaries towards water supply sources and facilities. Level of satisfaction of the public institutions on the sanitation arrangements. Number of households accessing safe, and equitable water supply (before and after program).
Health Outcome	
Communicable Diseases	<ul style="list-style-type: none"> Prevalence rates (evolution over time) of diseases such as malaria, schistosomiasis and diarrhea.
Non-Communicable Diseases	<ul style="list-style-type: none"> Prevalence of poisoning and goiter.
Gender	
Roles and Responsibilities	<ul style="list-style-type: none"> Time allocation of women before and after the project.
Income Generating activities	<ul style="list-style-type: none"> Proportions of household income devoted to water supply and sources of funds- men or women (before and after the project).

Table 2: Framework Environmental and Social Monitoring Plan for the TRLWZ

Environmental Component/ Aspect	Expected Impacts	Parameters to be monitored/ Indicators	Responsible Monitoring Organization/Persons	Frequency	Estimated Cost (ZMW)
Pre-construction phase					
Socio-economic	Creation of awareness about the project	Number of consultation meetings	MLGH/ Districts	Quarterly	390,000
Construction Phase					
Socio-economic	Creation of employment opportunities	Number of people employed	District Labour Officer	Quarterly	120,000

Environmental Component/ Aspect	Expected Impacts	Parameters to be monitored/ Indicators	Responsible Monitoring Organization/Persons	Frequency	Estimated Cost (ZMW)
	Skill transfer to local communities	Number of people trained	MLGH/ Provincial RWSS Engineer/ District Labor Officer	Quarterly	50,000
Biodiversity	Loss of vegetative cover	Size of land re-vegetated	District Forestry Officer	Quarterly	450,000
	Damage sensitive ecosystems or endangered species	Size of land re-vegetated	Zambia Wildlife Authority / Ministry of Lands, Environment and Natural Resources	Quarterly	150,000
Aesthetics	Noise and vibration	Reduced noise levels	Department of Occupational Safety and Health Services	Quarterly	150,000
Land and soil	Increased risk soil erosion	Reduced amount of soil erosion	Ministry of Lands, Environment and Natural Resources	Quarterly	150,000
Water Resources	Sedimentation of River	<ul style="list-style-type: none"> • Reduced amount of sediment in water sources 	<ul style="list-style-type: none"> • Water Resources Management Authority 	Bi-annual	120,000
	Increased risk of pollution	<ul style="list-style-type: none"> • Quality of water 	<ul style="list-style-type: none"> • MOH, Department of Water Affairs 	Bi-annual	500,000
Land and soil	Disturbance of agricultural activities	<ul style="list-style-type: none"> • Number of gardens disturbed 	<ul style="list-style-type: none"> • District Social Welfare Officer 	Bi-annual	150,000
Social economic	Influx of people to project areas during construction as well as after completion;	<ul style="list-style-type: none"> • Number of people flocking to the project areas 	<ul style="list-style-type: none"> • District Community Development Officer 	Bi-annual	50,000
	Risk of HIV/AIDS infection	<ul style="list-style-type: none"> • Number of awareness campaigns conducted; • Number of condoms distributed 	<ul style="list-style-type: none"> • District AIDS Coordinator 	Bi-annual	100,000
Occupation safety and health	Injuries due to construction works	<ul style="list-style-type: none"> • Reported cases of injuries/accidents 	<ul style="list-style-type: none"> • Department of Occupational Safety and Health Services 	Bi-annual	50,000
<i>Operation and maintenance phase</i>					
	Improved health and hygiene to water users	<ul style="list-style-type: none"> • Reduced incidences of water borne diseases 	<ul style="list-style-type: none"> • District Environmental Health Technician 	Bi-annual	120,000
	Reduced walking distance to water points	<ul style="list-style-type: none"> • Reduced distances to water points 	<ul style="list-style-type: none"> • Provincial Rural WSS Officer 	Bi-annual	150,000
Safety and Health	Reduced expenditure on treatment for water borne diseases	<ul style="list-style-type: none"> • Reduced expenditures on water borne diseases 	<ul style="list-style-type: none"> • District Medical Officer 	Bi-annual	150,000

Environmental Component/ Aspect	Expected Impacts	Parameters to be monitored/ Indicators	Responsible Monitoring Organization/Persons	Frequency	Estimated Cost (ZMW)
Water Resources	Increased risk of depleted water resources	• Reduced amount of water flowing in River	• Provincial Water Officer	Bi-annual	180,000
<i>Demobilization of construction phase</i>					
	Loss of employment	• Number of people laid off	• District Labour Officer	Quarterly	150,000
	Generation of waste	• Amount of waste generated	• District Environmental Health Technician	Quarterly	200,000

The Complimentary initiatives proposed for the project include

- Gender Mainstreaming to ensure that 30-50% women are included in the WUA's, Water Point Committees and Catchment Management Committees of the project
- at least 50% of women attend the water, sanitation, hygiene sensitization campaigns
- providing employment opportunities to the youth during construction and in the production of san plats for the sanitation facilities and (iv) inclusion of women and youth in the capacity building programs.

e) Institutional arrangements and capacity building requirements

The implementation of the program will use existing structures incorporating lessons and experience gained with the other similar operations. MLGH shall implement the program on behalf of the Government of the Republic of Zambia. As the overall NRWSSP requires strong inter-ministerial and multi-sectoral guidance, MLGH works closely with the Ministry of Finance (MOF), Ministry of Mines, Energy and Water Development (MMEWD), Ministry of Health (MOH), Ministry of Education (MOE), Ministry of Gender and Child Development (MGCD) Ministry of Community Development, Mother and Child Health (MCDMCH). The RWSSU within the MLGH will coordinate the program activities. It will monitor the progress of the program, the flow of funds and report on the achievement of performance targets.

In line with GRZ policies, national objectives, and sector strategy, the Local Authorities (LAs) will implement the program activities. The Provincial Engineer under the Department of Housing and Infrastructure Development will assist the District Rural Water Supply and Sanitation Officers and communities prioritize activities, ensure recovery of O&M costs, and monitor and report on WSS facilities. The Provincial Support Team will provide technical assistance to the districts to support and complement the MLGH's efforts to provide guidance and support to districts on a demand driven basis so as to facilitate the building of local capacity to develop and provide rural water supply and sanitation on a day to day basis. The support will be in Infrastructure Development, Sanitation and Hygiene Education, and Institutional Support and Capacity Building, and in line with the policies, principles and strategies of the NRWSSP. The PST will have a Social/ Environmental officer on site during construction. All construction works will be done by the private sector following public tendering.

The PST will comprise a Team Leader, an M&E Specialist, Project Accountant, Community Mobilisation Specialist (Gender focal point), Sanitation Specialist, Environmental/Social Expert and Water Engineer. These will be international/ national experts recruited competitively and will

be based in Mongu District (provincial headquarters of the Western Province). The MLGH will appoint, within the existing structures, the desk officer from the RWSSU who will be seconded as Project Manager.

The Capacity Building activities proposed for the program will be at National, Provincial, District and Community level. At the Provincial and District Level, support will be provided to Local Authorities (LAs), D-WASHEs and Ward Development Committees (WDCs). LAs are the major implementation arm of the MLGH. Training and capacity building will be offered in the areas of planning and budgeting, cross cutting issues including gender mainstreaming, disability and climate change adaptation, hygiene education including promotion of hand washing, CLTS Training of trainers, participatory methodologies, procurement, supervision of works, environmental monitoring, financial management and project reporting. Environmental Health Technicians, Rural Water and Sanitation Officers, Agriculture Extensions Officers, Finance officers, Procurement Officers, Forestry Officers, Community Development Officers, Social Welfare Officers, District Administration, Provincial Engineers and WDCs members will be trained. At community level training will focus on community level governance through community water management committees and women's empowerment, training of artisans and community members.

This will improve the quality and effectiveness of water, sanitation and hygiene promotion programs. The program will facilitate the formation of V-WASHE Committees with at least 50% women who shall be responsible for the operation and management of the water points and schemes. The committees will be trained with guidance of the Rural Water and Sanitation Officers and suitably qualified NGOs. Training will cover all aspects of community level skills and operational responsibilities for water supply operations & maintenance and sanitation (CLTS champions), including but not necessarily limited to technical aspects and financial management (establishment of maintenance fund) and community level Climate Change Adaptation (CCA) in line with established policies and procedures to be developed with NDF funding. In addition, training on construction and use of household biogas plants will be done during the process of field testing the CCA procedures. WASH stakeholder coordination will also be facilitated through exchange visits between districts from Western Province and other districts in the country of key stakeholder representatives to learn about successes especially in the CLTS.

Monitoring Roles & Responsibilities

As provided, the overall monitoring is the responsibility of the Program Executing Agency (Ministry of Local Government & Housing - MLGH). Monitoring roles and responsibilities of MLGH and other stakeholders may be defined as follows:

Ministry of Local Government & Housing: MLGH is responsible for the overall implementation, administration and enforcement of the recommendations of this ESIA and the ESMP report. The Ministry's Department of Housing & Infrastructure headed by a Director shall:

- Ensure that the ESMP provisions are included in all tender documents issued for construction work and activities on site and shall monitor/enforce that the Tenderers/Contractors abides by the specifications thereof. Coordinating the implementation of the ESMP among the LAs, Consultants, and contractors
- Receiving safeguard compliance quarterly reports from LAs and consultants and preparing annual environmental progress reports
- Facilitate LAs in registering with ZEMA for sub-projects that would require undertaking of full EIA studies
- Conducting

training for institutional capacity building · Organizing biannual environmental and social audits for the Program · Provide ZEMA with reports on environmental and social compliance as part of their annual progress reports and annual environmental monitoring reports. Report to AfDB and other Program financiers on the status of safeguard matters through submission of annual and quarterly progress reports during operation and construction phases respectively.

Ministry of Lands, Natural Resources & Environmental Protection (MLNREP) shall ensure that, in inevitable events involving land acquisition and displacement of people, correct procedures are followed by Las to acquire land from current owners · Ensure compensation to current land owners follows what is indicated in the laws

Zambia Environmental Management Agency is the main responsible agency for foreseeing development projects carried out in the Republic of Zambia adequately addresses environmental and social issues during the lifetime of the projects. ZEMA shall periodically carry out or assign an independent evaluator to carry out compliance monitoring in cases where claim has been raised from any member of the community, CBO, or NGO on the negative aspects of the relevant sub-project; and have the power to request for compliance and take necessary measure including fines to enforce compliance of ESMP.

ESM/LAs:

These will be responsible for monitoring, reviewing and verifying compliance with the ESMPs by the Contractors.

Basin Water Offices Under the Water Management Authority (BWOs) were established to ensure sustainable management of water resources through monitoring water availability, planning, allocating and regulating its use, and control pollution. BWOs shall therefore ensure that subprojects are implemented in line with basin water resources management plans.

Contractors shall ensure that the environmental and social specifications of the SESA, ESMPs (including any revisions, additions or amendments) are effectively implemented; and notify the ESM/BWOs and Engineers immediately in the event of any accidental infringements of the environmental requirements to enable appropriate remedial action to be taken.

Resident Engineers shall be familiar with the contents of the ESMP. Monitor the Contractor's compliance with the environmental and social requirements on a daily basis and enforce compliance.

f) Public consultations and disclosure requirements

Public consultation is a permanent exercise during sub-program design and implementation as all of these activities are carried out at the local level by the stakeholders. A series of stakeholder consultations were held throughout the study period and the drafting of the ESMP. The mode of consultation involved round table discussion, focus group discussion; key informant interviews and one to one interviews. Key stakeholders consulted included traditional leaders, line Ministries, NGOs, project beneficiary communities and members of the DWASHEs from the 16 Districts of Kalabo, Mongu, Sesheke, Shangombo, Kaoma, Lukulu, Senanga, Mwandu, Mulobezi, Sioma, Nalolo, Mitete, Luampa, Nkeyema, Limulunga and Sikongo.

Public Consultation was undertaken in the target districts where public presentations at organized venues (i.e. village and schools) in the concerned Districts and consultative meetings organized by District Authorities were held. The issues raised during the public consultations have been taken into consideration in the design of mitigation measures. Zambia's Environmental Management Act of 2011 stipulates under section 23 that "The proponent of a policy, program or plan that could have an adverse effect on environmental management or on the sustainable management and utilisation of natural resources shall conduct a strategic environmental assessment of the draft policy, program or plan and present a strategic environmental assessment report to the ZEMA, for approval". The water and environmental legislation in Zambia is in line with the ESAPs and most importantly it is advanced enough to include gender equality issues and climate change adaptation and mitigation. The legal framework will therefore be the basis of environmental monitoring by the environmental authority and at the same time it will meet monitoring requirements for the Bank. The protection of sensitive ecosystems, the vulnerable in terms of women and the youth are all included in various pieces of water and environmental legislation and specifically national water and sanitation policy is aimed at protecting the vulnerable against climate change impacts.

The ESMP will be submitted to the ZEMA for review and approval. On the Bank side, this ESMP Summary will be validated by the Compliance and Safeguards Division and then disclosed on the Bank's website for a period of 30 days prior to the presentation of the project to the Board.

g) Estimated costs

The cost for the implementation of the ESMP shall be included in the overall supervision cost of the program. Most of the social and environmental cost which involves engineering design is embedded in the engineering costs. Further, the ESMP for each activity and the ZEMA Environmental Guidelines for contractors shall be included as part of the contract documents to ensure contractors price for the ESMP measures. As provided in the ESMPs, the estimated costs for the implementation and management of safeguard requirements for the entire program amounts to approximately ZMW 3.46 million. In addition to table 2 above; these include costs for prevention of pollution to the water sources, minimizing noise, dust, costs for provision of construction workers with personal protective equipment, and costs for re-planting and restoration of areas disturbed by construction works, HIV/AIDS sensitization etc.

h) Implementation schedule and reporting

All the mitigation measures highlighted in the SESA and this summary will be implemented alongside with the implementation of programme subprojects as required and planned in the implementation schedules during before and during construction. However some monitoring will happen beyond construction for water quality. Capacity building will also go beyond the construction phase. All mitigation and enhancement measures will be implemented and reported in the periodic progress reports, reports for supervision missions, midterm reviews and a specific annual report on ESMP implementation to the ADB on an annual basis. The successful implementation of the ESMP will require input, expertise and resources from all the key

stakeholders including the beneficiary communities. Therefore these key stakeholders will need to collaborate at all levels, starting from the village, ward, district and national levels.

Some of the stakeholders will require basic training in the monitoring of the implementation of environmental and social management plan. The training shall be provided by the Social/Environmental Expert of the PST.

At the National level, the MLGH will have the overall responsibility for coordinating and monitoring implementation of the ESMP. The ministry will work through the PST, key line Ministries and the Local Authorities and from the implementing districts.

At the District level, the District Rural Water Supply and Sanitation Officer with guidance from the Provincial Engineer under MLGH will be responsible for monitoring the implementation of the ESMP at district level. In addition, it will also be responsible for the identification of emerging environmental and social issues that need inclusion in the ESMP. Environmental District Officers for the implementing district will coordinate all the activities at district level.

At community level, the Ward Development Committees and the Village Water Supply and Sanitation Hygiene Committees including the Local Leaders or their representatives will ensure that the program is being implemented according to the developed WSS plans.

The environmental monitoring and management reports will be prepared by the Contractor's Environmental Officers in close collaboration with the District Environmental Health Technicians. The reports will be incorporated in IPRs and submitted to AfDB. The monitoring report will include the following: (i) compliance with AfDB loan covenants and government regulations; (ii) status of implementation of ESMP; (iii) significant issues or changes in scope of the project interventions; (iv) summary of monitoring report findings; (v) required follow-up actions; and (vi) conclusions. Implementation of the safeguards will also be included in the overall periodic progress reports, supervision mission's Aide Memoires, midterm review and monitoring and evaluation reports on the project performance from MLGH.

During Operations Phase, the sustainability of water facilities and schemes will be assured through the use of simple technologies for which the relevant technical expertise exists in the country. In addition, there will be training of community representatives and districts in operations and maintenance of the selected technology options. Environmental sustainability will be assured by mainstreaming and adopting the SESA of the NRWSSP and ensuring that all negative impacts of activities are identified and addressed as part of sub-program implementation activities. The participatory nature of the program ensures overall sustainability. Communities are more likely to take better care of facilities that they selected and contributed to the capital costs and responsibility for their O&M. Implementation will be based on a demand responsive approach whereby all the stakeholders, including the communities (women, youth, vulnerable groups such as people with HIV/AIDS, and disabled people) are involved to ensure a sense of ownership and commitment towards the program. In addition, the integrated approach adopted in the design and implementation of the program, which combines the provision of water and sanitation, sensitization of communities, promoting participation of communities in the identification and implementation of facilities in their areas will enhance sustainability of the services to be provided by the intervention.

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