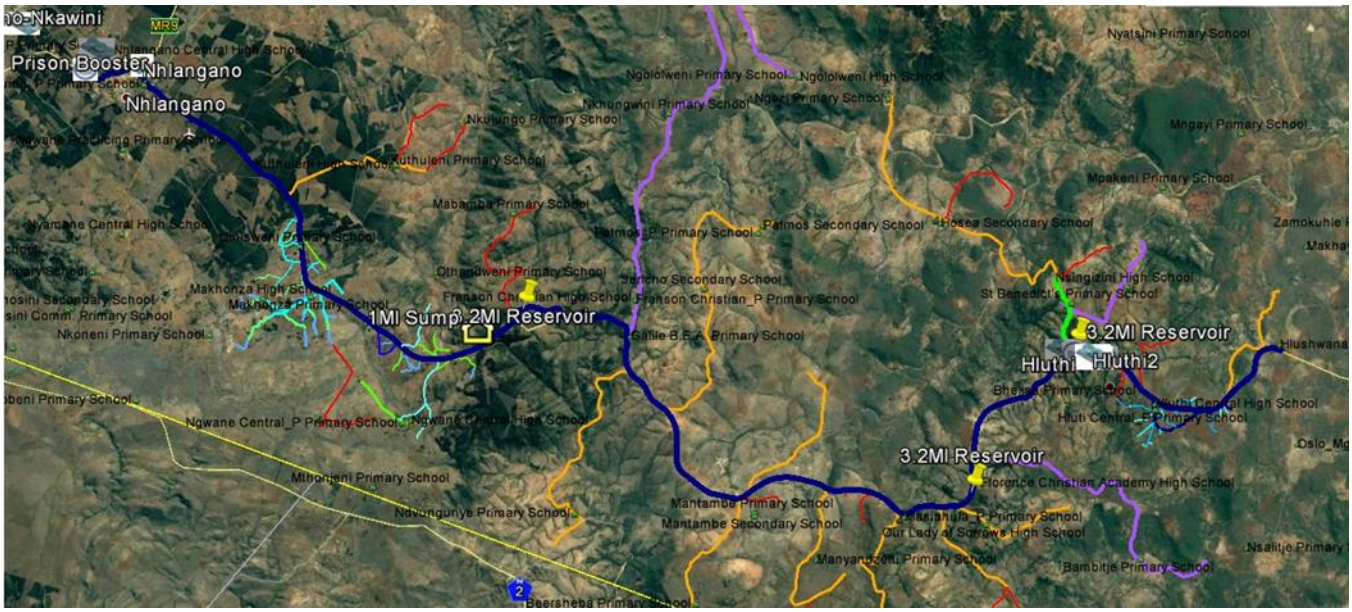
ESWATINI WATER SERVICES CORPORATION



GENERIC ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN FOR THE NHLANGANO-SIPHAMBANWENI WATER SUPPLY AND SANITATION PROJECT- SANITATION COMPONENT

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EXECUTIVE SUMMARY

The Shiselweni region has the lowest percentage access to improved sources of drinking water. Only 56 percent of the population in this region have access to an improved source of drinking water and 19.7 percent have access to improved sanitation1. Approximately 35 percent of this target group use piped water, 13 percent use tube well/borehole, 10 percent use an unprotected well (an unimproved source) and most of the remainder use surface water (24 percent). Most of the population (68 percent) does not have access to drinking water on their premises and a total of 31 percent must travel more than 30 minutes to collect water (both improved or unimproved source). A total of 12 percent of the population openly defecate and 17 percent of households were observed as having a place for handwashing.

Project Development Objectives

The Project Development Objective is to increase access to improved water supply and sanitation services in targeted areas of Eswatini.

The project will include 4 components, as follows: (1) Water Supply Extension, (2) Improved Sanitation Access, (3) Project Management and Institutional Strengthening, and (4) Contingency Emergency Response. The project will include 4 components, as follows: (1) Resilient Water Access and Management, (2) Improved Sanitation Access, (3) Project Management, and (4) Contingency Emergency Response.

- **Component 1: Resilient Water Access and Management.** This component will provide financing to increase potable water supply coverage in the Shiselweni region, improve long-term management of water resources, investment planning and sustainability of water supply service provision, and build resilience to climate and disaster risks, with a focus on droughts.

- **Component 2: Improve Sanitation Access.** This component will build on the ongoing work that has been done by the Environmental and Health Department on appropriate technology/sanitation service delivery for rural domestic sanitation to arrive at an open defecation-free corridor in the three tinkhundla (Zombodze, Hosea and Shiselweni I) that will benefit from improved access to water services.

- **Component 3: Project Management.** This component will provide project management support including operating costs, the preparation of progress reports, independent audits, as well as support on project financial, procurement, environmental and social management, as needed.

- **Component 4: Contingency Emergency Response (Zero Budget).** This component will support potential disaster recovery needs by providing immediate response to an eligible crisis or emergency, as needed. This may consist of immediate support in assessing the emergency's impact and developing a recovery strategy or the restructuring of existing, or provision of new, Investment Project Financing, and may also include operating costs, supply of critical parts and equipment, minor civil works rehabilitation, supply of fuel, rent of generators, as well as rapid transportation of chemicals and critical parts by express mechanisms.

Project Beneficiaries

The beneficiaries of the sanitation component will be the total population of the three target Tinkhundla (Zombodze (14,231), Hosea (14,733) and Shiselweni I (9,269)) with a maximum

[1] Multiple Indicator Cluster Survey, Central Statistics Office, 2014

reachable population of 38,233 people (2017), estimated to increase to 47,463 by 2047. Improved sanitation services will be provided to 4 health clinics and 32 schools in the three target Tinkhundla reaching an estimated 2,000 people and 5,600 people, respectively. The Baby WASH interventions will target all households with children under 1000 days old living in the household (assuming approximately 8 percent of households2).

Environmental and Social Standards

In order to reduce, minimise and mitigate adverse impacts and undue harm of its development projects to the environment, all bank-financed projects are guided by environmental and social standards. The Bank is committed to supporting GoKE/EWSC in the development and implementation of projects that are environmentally and socially sustainable, and to enhancing the capacity of implementing agency/PIU's environmental and social frameworks to assess and manage the environmental and social risks and impacts of projects. To this end, the Bank has defined specific Environmental and Social Standards (ESSs), which are designed to avoid, minimize, reduce or mitigate the adverse environmental and social risks and impacts of projects. The Bank will assist EWSC in their application of the ESSs to component 2 of the project.

Environmental and Social Management Plan

The Environmental and social management plan (ESMP) is one of the which the Bank requires the ESWC to prepare in order to determine and effectively manage the environmental and social risks and impacts of a project throughout the project life cycle. This instrument that details (a) the measures to be taken during the implementation and operation of a project to eliminate or offset adverse environmental and social impacts, or to reduce them to acceptable levels; and (b) the actions needed to implement these measures.

Environmental and Social Risk Classification

The Bank will classify all projects (including projects involving Financial Intermediaries (FIs)) into one of four classifications: High Risk, Substantial Risk, Moderate Risk or Low Risk. In determining the appropriate risk classification, the Bank will take into account relevant issues, such as the type, location, sensitivity, and scale of the project; the nature and magnitude of the potential environmental and social risks and impacts; and the capacity and commitment of the EWSC (including any other entity responsible for the implementation of the project) to manage the environmental and social risks and impacts in a manner consistent with the ESSs. Other areas of risk may also be relevant to the delivery of environmental and social mitigation measures and outcomes, depending on the specific project and the context in which it is being developed.

Risk Classification-Moderate

The component II of this project (sanitation) is classified as *Moderate Risk*. Specifically, due to the fact that:

(i) the potential adverse risks and impacts on human populations and/or the environment are not likely to be significant. This is because the project is not complex and/or large, does not involve activities that have a high potential for harming people or the environment, and is located away from environmentally or socially sensitive areas. As such, the potential risks and impacts and issues are likely to have the following characteristics:

- predictable and expected to be temporary and/or reversible
- low in magnitude
- site-specific, without likelihood of impacts beyond the actual footprint of the project

[2] Based on Eswatini MICS survey results 2014

- low probability of serious adverse effects to human health and/or the environment (e.g. do not involve use or disposal of toxic materials, routine safety precautions are expected to be sufficient to prevent accidents, etc.)

(ii) risks and impacts can be easily mitigated in a predictable manner

Environmental and Social Impacts

Beneficial Impacts

a) Reduced Spread of Public Health Diseases

The construction of pit latrines in households will lead to reduction in Open Defecation and achieve Community Total Led Sanitation (CLTS) which will in effect lead to reduction in public health diseases spread by poor sanitation including open defecation.

b) Infant mortality

The project will lead to reduction in infant, child and maternal mortality and morbidity due to improved health and sanitation services in the health units and household level.

c) Improved Hygiene For Girl Child

The construction of septic tanks and toilet facilities in schools will lead to generally improved hygiene in these facilities. There is lack of adequate sanitation facilities in schools equipped for menstruation management. The onset of menstruation coincides with higher dropout rates among female students. Lack of information about menstruation, and the absence of adequate sanitation facilities exacerbates the challenges faced by girls and young women. Poor menstrual hygiene, caused by inadequate sanitary conditions, places adolescent girls at risk of urinary tract infections.[3] The project will promote design standards that take into account menstrual hygiene management needs and good practice (separate cabins for boys and girls, safe locks, lighting, presence of disposal bins, and handwashing stations). These activities will be supplemented with a hygiene promotion campaign in schools, with information on menstruation (designed for students and teachers).

d) Employment Creation

The construction of the septic tanks and pit latrines will lead to the creation of employment (skilled and un-skilled) due to the fact that workers will be required for construction purposes.

e) Reduced Contamination of Water Resources

Better and properly sited sanitation facilities at the household level will reduce the risk of contamination of surface and groundwater resources.

Table 0-1. Adverse Impacts

Project Phase	Environmental / Social Impact	Mitigation Measure
Construction	Site Related Oil Spills	• Employee awareness on company procedures for dealing with spills and leaks from oil storage tanks. • Containment of leaks. • Provision of absorbent material • Maintenance of contractor's equipment • Provide training (households) on construction of pit latrines in accordance with Eswatini's Guidelines for construction of and siting of pit latrines.
Construction	Soil Related Impacts	• Stock piling of soil for reuse • Restoration of the ground by sowing adequate grass cover and planting of trees. • Planning emergency response measures in case of accidental oil spills.

[3] Humanitarian Needs Overview, The Kingdom of Eswatini, 2016

Project Phase	Environmental / Social Impact	Mitigation Measure
		• Provide training (households) on construction of pit latrines in accordance with Eswatini's Guidelines for construction of and siting of pit latrines.
Construction	Impact on Water Resources	• Provide a waste management plan • Proper solid and liquid wastes disposal mainly from the construction sites. • Ensuring proper measures are in place for collection and disposal of spilled oils and lubricants. • Provide training (households) on construction of pit latrines in accordance with Eswatini's Guidelines for construction of and siting of pit latrines.
Pre-construction	Socio-Economic Impacts	• Prepare a labour influx plan to manage labour influx • Prepare GBV/SEA Action plan
Construction		• Hiring unskilled construction and skilled (if available) labour from the local population as far as possible. • Use of manual labour during excavation and construction works where possible. • Sensitizing workers and the surrounding community on awareness, prevention and management of HIV / AIDS. • Provide an on-site clinic to provide VCT services. • Enforcing and maintaining a code of conduct for his employees
Construction	Air Quality	• Use of protective clothing like dust masks on construction crew. • Operated and maintenance of contractor's plant in compliance with relevant vehicle emission standards and manufacturer's specification to minimize air pollution.
Construction	Noise Pollution	• Avoiding night time construction when noise is loudest near residential areas. • No discretionary use of noisy machinery within 50 m of residential areas and near institutions or use of manual labour in these sections. • Good maintenance and proper operation of construction machinery. • Where possible, ensure non-mechanized construction to reduce the use of machinery
Construction	Impact on flora and fauna	• Re-planting the indigenous vegetation as much as possible once work is completed. • Sparing the vegetation that must not necessarily be removed. • Provide a waste management plan • Provide training (households) on construction of pit latrines in accordance with Eswatini's Guidelines for construction of and siting of pit latrines. • Promoting non-mechanized methods of construction. • Ensuring protection of the flora and fauna by proper handling of cement during civil works. • Ensure that the employees on site are aware of the company procedures for dealing with spills and leaks from oil storage tanks • Provision of dustbin and sanitation facilities.
Construction	Public Health and Safety	• Ensuring proper maintenance and operation of Contractor's plant. • Providing workers with appropriate personal protective equipment (PPE). • Provide workers with adequate drinking water and breaks. • Provide workers training on safety procedures and emergency response.

Project Phase	Environmental / Social Impact	Mitigation Measure
		• Provide a waste management plan. • Cordon off working areas with a reflective tape to ensure safety of pedestrians and provide crossing areas for access to cut off businesses and structures. • Providing clean toilets for workers. • Provide training (households) on construction of pit latrines in accordance with Eswatini's Guidelines for construction of and siting of pit latrines.
Construction	HIV & AIDS Impacts	• Sensitizing workers and the surrounding communities on awareness, prevention and management of HIV/AIDS. • Provide an on-site clinic to provide VCT services to construction crew
Construction	Child Labour and Protection	• Provide and implement a child protection strategy • Ensuring no children are employed on site in accordance with national labour laws • Ensuring that any child sexual relations offenses among contractors' workers are promptly reported to the police

Construction	Gender Equity, Sexual Harassment	• Provide and implement a gender-based violence strategy, which will include:
		  ○ Gender mainstreaming in employment at the worksite with opportunities provided for females to work, in consonance with local laws and customs
		  ○ Grievance redress mechanisms including non-retaliation.
		  ○ Provide and implement an employee code of conduct
		  ○ The works contractor should be required, under its contract, to prepare and enforce a No Sexual Harassment and Non-Discrimination Policy, in accordance with national law where applicable.

Operation	Odour/Foul smell	• Ensure proper siting of the pit latrine • Provide training to communities on proper use of latrines and hygiene • Provide hand washing facilities
Operation	Water pollution/contamination	• Ensure proper siting of the pit latrine and septic tanks • Provide training to communities on proper use of pit latrines • Provide hand washing facilities
Operation	Exposure to pathogens	• Ensure pit latrines are frequently cleaned • Provide training to communities on proper use of pit latrines • Provide hand washing facilities
Operation	Disease Spread	• Ensure pit latrines are frequently cleaned • Provide training to communities on proper use of latrines • Provide hand washing facilities
Decommissioning	Decommissioning of old pit latrines/septic tanks	• Ensure that pit latrines are covered when decommissioned to avoid pathogen exposure

Public Consultations

This being a framework, the level of stakeholder consultation has been focused to only the already known partners and specifically those that could be identified at this early stage. Section 9 and Annex **A** shows the institutions and stakeholders consulted thus far and the issues and responses from the consultation process. During consultation exercises the following issues were raised by participants: i) the need to ensure that the water kiosks are centrally placed and reasonably distributed to allow for ease of access, ii) highlighted unemployment issues and the need for fair consideration by the contractor of women in the

jobs to be available, iii) possible impacts such as interaction of communities with construction workers and, iv) project scope review to cover nearby areas that were also not covered by the EU project.

Capacity Building and Training

Capacity development and strengthening remains a crucial component in this ESMP and will be integrated all through the project implementation phase. Capacity building will be in the form of training seminars/ workshops for EWSC and PIU staff to be able to successfully implement environmental and social aspects of the project. The proposed training modules will cover among others:

a) World Bank ESSs
b) Monitoring
c) Training on proper construction of pit latrines (for households) as per EHD/MOH guidelines
d) Proper siting of pit latrines (for households) as per EHD/MOH guidelines
e) Proper siting of septic tanks
f) Proper use of pit latrines (for households) as per EHD/MOH guidelines
g) Cleaning and maintaining pit latrines (hygiene)
h) Cleaning/removal of sludge from pit latrines and septic tanks
i) Training on handwashing in schools, households and health facilities
j) Communication for a change in hygiene behaviour;

The estimated cost of capacity building and other support to implement the ESMP is US $, 500,000 which excludes the cost of preparing component 2 specific ESMPs when required by EAA.

Project Implementation

Eswatini Water Services Corporation-Project Implementation Unit

The EWSC will have overall responsibility for project implementation and coordination of activities. EWSC has established a project implementation unit (PIU), which includes a manager/coordinator and key specialists in the areas of engineering, environmental, social, procurement and financial management. In addition to these specialists, the PIU will also include sub-coordinators from Environmental Health Department (EHD) of the Ministry of Health (MoH). The PIU will be responsible for preparation of consolidated workplan, procurement, financial, technical, environmental and social related documentation required for the project, as well as for the overall project monitoring and evaluation and preparation of progress and financial reports for the Project. A Project Operations Manual (POM) describing all processes, procedures, roles, and responsibilities related to project management and implementation will be prepared by the PIU within 3 months after project effectiveness.

Environmental Health Department

The rural water supply unit closely coordinates at the operational level with the Environmental Health Department (EHD) of the Ministry of Health (MoH), who is responsible for the coordination of the overall sanitation and hygiene sector in rural and peri-urban areas, around the construction of latrines in the same communities, as well as hygiene awareness programs. The EHD also cooperates with the Ministry of Education and Training to provide improved sanitation and hygiene services at school level. EHD activities comprise the support for construction of pit latrines in the rural areas where it provides technical support for construction of facilities and material provision. Behavior change and education promotion on proper use of drinking water and sanitation facilities are also done through this department.

The EHD will identify households, education and health facilities to benefit from the sanitation infrastructure. Further, the EHD will prepare project briefs for submission to EAA to determine category of the investment and will conduct training and capacity building targeting households on construction of pit latrines including sanitation hygiene and use of the facilities.

Eswatini Environmental Authority

The Government of Eswatini places the responsibility of environmental protection on EEA as the coordinating agency. EEA is charged with the overall role of providing oversight in regard to monitoring for all project activities that have potential impacts on the environment in Eswatini. EAA will provide Environmental Compliance Certificate (ECC) for proposed sanitation projects and specifically the septic tanks to be constructed in schools and health facilities which are falling under category 1 hence only requiring ESMP. Household pit latrines may not require any further environmental analysis but will comply with the EHD's guidelines for construction of pit latrines (see annex). Without EEA's approval implementation of the investment project will not move forward.

ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CMAC	Conciliation, Mediation and Arbitration Commission
CMP	Comprehensive Mitigation Plan
dB	decibels
DWA	Department for Water Affairs
ECC	Environmental Compliance Certificate
ECC	Environmental Compliance Certificate
EEA	Eswatini Environment Authority
EHD	Environmental Health Department
EHD	Environmental Health Department
EIA	Environmental Impact Assessments
EMCA	Environmental Management and Coordination Act
EMP	Environmental Management Plan
ENPF	Eswatini National Provident Fund
ENTC	Eswatini National Trust Commission
ESIA	Environmental and Social Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and social management framework
ESMPs	Environmental Social Management Plan
ESSs	Environmental and Social Standards
EWSC	Eswatini Water Services Corporation
FIs	Financial Intermediaries
HIV	Human Immunodeficiency Virus
IEE	Initial Environmental Evaluation
KoE	Kingdom of Eswatini
MEPD	Ministry of Economic Planning and Development
MNRE	Ministry of Natural Resources and Energy
MOAC	Ministry of Agriculture and Co-operatives
MOH	Ministry of Health
MOPDO	Members of Parliament and Designated Office Bearers Pension Fund
NDMA	National disaster Management Agency
NGOs	Non-Governmental Organizations
NRB	Natural Resources Board
PAD	Project Appraisal Document
PAPs	Project Affected Persons
PIU	Project Implementation Unit
POM	Project Operations Manual
PPE	personal protective equipment
PRSAP	poverty reduction strategy and action plan
PSPF	Public Service Pension Fund
SEA	Strategic Environmental Assessment
STIs	Sexually Transmitted Infections
VCT	Voluntary Counseling and Testing
WB	World Bank

1. INTRODUCTION

The water sector is one of Eswatini's most valuable assets, central to the country's long-term development goals and critical for mitigating against these increasing climate risks. Eswatini's surface water resources are estimated at 4.5 km^3/year with 42 percent originating from South Africa. In addition to relying on transboundary rivers and groundwater for its water supply, high water demand makes Eswatini a "high water stress" country; meaning that the ratio of total annual water withdrawals to total available annual renewable supply averages between 40-80 percent.[4]

Universal access to safe water and sanitation is part of Eswatini's National Development Strategy, but the country remains behind its established goal of achieving 100 percent coverage by 2022. Whilst access to water supply and sanitation services is relatively high in urban areas the situation is much worse in rural areas. The country's Central Statistics Office indicated in 2014 that improved sources of drinking water are used by 96 percent of the urban population.[6] Accessibility is high with 95 percent of the urban population having water access to piped water on premises. Improved sanitation is accessed by 94 percent of the urban population.

Sources of water vary in rural areas, with piped water on premises making up 44 percent of rural supply, groundwater 31.5 percent and surface water up to 21 percent.[5] Improved sources of drinking water are used by 63 percent of the population in rural areas.[6] Countrywide, for 62 percent of households, an adult female usually collects drinking water when the source is not on premises, usually the case in about 50 percent of the rural households in eSwatini.[6] An adult male is tasked with collecting water in 21 percent of households.

Of the 78 percent of the rural population with access to improved sanitation, two percent are connected to sewerage systems, four percent use septic tanks and 72 percent use latrines and other improved types of facilities, of which 29 percent are shared.[12] The remaining 22 percent of the rural population has either access to unimproved facilities (eight percent) or practice open defecation (14 percent).[12] In addition, only 25 percent of the population in rural areas have handwashing facilities.[12] Poverty prevalence and access to water supply, sanitation and hygiene are strongly correlated, with the lowest quintiles having the least access.[12]

The Shiselweni region has the lowest percentage access to improved sources of drinking water. Only 56 percent of the population in this region have access to an improved source of drinking water and 19.7 percent have access to improved sanitation7. Approximately 35 percent of this target group use piped water, 13 percent use tube well/borehole, 10 percent use an unprotected well (an unimproved source) and most of the remainder use surface water (24 percent). Most of the population (68 percent) does not have access to drinking water on their premises and a total of 31 percent must travel more than 30 minutes to collect water (both improved or unimproved source). A total of 12 percent of the population openly defecate and 17 percent of households were observed as having a place for handwashing.

According to the latest Eswatini household income and expenditure survey (Central Statistics Office, 2016), 41.75% of the population has access to clean water, while 53.68% of the population have access to proper sanitation. The Shiselweni region has the lowest access to

[4] World Resources Institute; https://wriorg.s3.amazonaws.com/s3fs-public/aqueduct_coutnry_rankings_010914.pdf?_ga=2.79169556.1660194554.1553017757-1662036744.1552070501.

[5] Multiple Indicator Cluster Survey, Central Statistics Office, 2014

[6] Multiple Indicator Cluster Survey, Central Statistics Office, 2014

[7] Multiple Indicator Cluster Survey, Central Statistics Office, 2014

improved sources to drinking water and lowest access to proper sanitation. The Nhlangano Siphambanweni project will contribute positively on this indicator. The Environmental Health Growth and Development pillars of the poverty reduction strategy and action plan PRSAP (2006-2022) have realized that there is a need to improve the quality of life access to potable water and sanitation services in some areas of Eswatini.

1.1 Project Objectives

The Project Development Objective is to increase access to improved water supply and sanitation services in targeted areas of Eswatini.

1.2 Project Component

The project will include 4 components, as follows: (1) Water Supply Extension, (2) Improved Sanitation Access, (3) Project Management and Institutional Strengthening, and (4) Contingency Emergency Response. The project will include 4 components, as follows: (1) Resilient Water Access and Management, (2) Improved Sanitation Access, (3) Project Management, and (4) Contingency Emergency Response.

- **Component 1: Resilient Water Access and Management.** This component will provide financing to increase potable water supply coverage in the Shiselweni region, improve long-term management of water resources, investment planning and sustainability of water supply service provision, and build resilience to climate and disaster risks, with a focus on droughts.
    - Sub-component 1.1: Improved Water Access. This sub-component will provide financing to ESWC for the expansion of the water supply transmission and distribution systems that will increase potable water access to an additional 18,478 people in rural areas and small towns from Nhlangano to Siphambanweni and interconnect the Nhlangano and Lavumisa water supply systems, including a transmission pipeline, reservoirs, pumping station and distribution network, as well as the detailed engineering designs and construction supervision activities. This sub-component will also support the EWSC on efficiency improvements, including areas such as energy efficiency, strategic asset management and non-revenue water reduction.
    - Sub-component 1.2: Resilient Water Management. This sub-component will focus on improved long-term management of water resources, investment planning and sustainability of water supply service provision, particularly in rural areas, which will contribute towards increasing these areas' resilience to droughts. DWA will lead the implementation of this component.
    - Sub-component 1.3: Improving Eswatini's Drought Preparedness and Resilience. This sub-component will concentrate on building resilience to climate and disaster risks, with a focus on droughts frequency and intensity. Activities financed under this component include the development and implementation of a drought monitoring and early warning system, as well as the development of a framework that will allow for a comprehensive country-wide assessment of potential climate and disaster risks. NDMA will lead the implementation of this component.

- **Component 2: Improve Sanitation Access.** This component will build on the ongoing work that has been done by the Environmental and Health Department on appropriate technology/sanitation service delivery for rural domestic sanitation to arrive at an open defecation-free corridor in the three tinkhundla (Zombodze, Hosea and Shiselweni I) that will benefit from improved access to water services.
  This component will finance a range of sanitation interventions aimed at reducing the incidence of water-related diseases and improving the quality of life of the beneficiaries in the project area, including: (i) expand access to domestic sanitation services in the

project area; (ii) assess and pilot the use of appropriate technologies for on-site sanitation in informal settlements, health centers and schools; (iii) pilot Baby-WASH (Water Supply, Sanitation and Hygiene) interventions in households with children under 1000 days old; (iv) undertake complementary sanitation communication and behavior campaigns (including menstrual hygiene management), supply chain enhancement and consistent behavior change programs to create sustained behavior change and buy-in to the project outputs; (v) support the establishment of a rural water supply and sanitation information system that will assess the functionality of water supply and sanitation services over time in order to better inform policy formulation, planning and resource allocation for the provision of better quality and more sustainable water supply and sanitation services. This component will also provide support to strengthen institutions, policies, data collection and planning, and long-term sustainability of sanitation services. In addition, the implementation of this component will also contribute to the reduction in the volume of untreated fecal sludge ending up in water bodies, helping reduce water stress by avoiding the pollution of water resources, therefore augmenting the availability of water supply that can be used in situations of water stress. This component will also enhance directly human capital through improved sanitation and hygiene infrastructure and related-behaviors, targeting women and children, the most vulnerable people in society.

- **Component 3: Project Management.** This component will provide project management support including operating costs, the preparation of progress reports, independent audits, as well as support on project financial, procurement, environmental and social management, as needed.

- **Component 4: Contingency Emergency Response (Zero Budget).** This component will support potential disaster recovery needs by providing immediate response to an eligible crisis or emergency, as needed. This may consist of immediate support in assessing the emergency's impact and developing a recovery strategy or the restructuring of existing, or provision of new, Investment Project Financing, and may also include operating costs, supply of critical parts and equipment, minor civil works rehabilitation, supply of fuel, rent of generators, as well as rapid transportation of chemicals and critical parts by express mechanisms.

Table 1-1.Proposed Project Details

SN	Component	Details
1	**Water Supply**	• Construction of an 21km 400mm Ductile Iron gravity, 3km 400mm Ductile pumping and 41km 250mm ductile iron gravity mains with isolation, air, scour valves and are supply tee junctions • Construction of 3 x 3.2Ml Reservoirs at key strategic places • Construction of pump house and 1Ml sump at strategic place • Construction of 244km Lateral networks • Construction of additional distribution networks • Construction of 24 water kiosks in peri-urban and adjacent rural areas. • Construction of MW solar generation plant and control systems
2	**Sanitation**	• Construction of septic tanks for all schools, clinics in the area • The component also includes demonstration latrines where the poor live i.e. in the rural and peri-urban areas, conduct public awareness campaigns and carryout health and hygiene

		education for the communities and schools, including preparing training materials for teachers, and hygiene promotion to about 20,000 people, of which more than 11,000 are women.
3	**Institutional Capacity Development**	• Support in training and capacity building within EWSC for WB funded projects comprising engineering services for design and supervision • Training for Kiosk operators

1.3 Generic ESMP For Component 2

Under this project, component 2, as described above entails construction of sanitation facilities in educational and health facilities and within individual households within the Shiselweni Region. Facilities will include septic tanks (targeted to health and educational facilities) and VIP toilets in households. The locations of the educational and health facilities, design of septic tanks are unknown at this point in time. Similarly, the type of toilets and the households to benefit from the individual sanitation facilities are not known and it is against this background that this ESMP is prepared for component 2.

Table 1-2. Typology of Pit Latrines to be constructed

Sanitation System	Description	Advantages	Disadvantages
VIP Toilets	• Pit toilet with an external ventilation pipe	• Local material can be used for construction • Low construction cost • Easy to maintain	• Homestead should have considerably large vacant area to allow for re-location of toilet • Unlined pit may collapse • Excreta is visible to user • System cannot be installed inside a house
Reusable VIP Toilet Superstructures	• VIP latrine superstructure made of precast concrete	• It can be moved to a new site once the pit is full • Easily assembled • Made of light panels and can be replaced • Supplied with a seat and hand washing facility	• Sourced outside the country
Urine Diversion Toilets	• Urine is diverted at source by a specially designed pedestal and may simply be led to a shallow soak pit. Faeces are deposited in a shallow vault and covered with a sprinkling of ash or dry soil	• Can be used in areas where there are unfavorable geotechnical or hydrological conditions • Can be favourable for high density settlements • May be installed inside the house • Urine can be collected into a container and re-used as fertilizer • Absence of odours or flies	• There are slightly more operational requirements of this toilets, but are minimal • Negative attitudes for handling and using excreta • Cannot stand abuse
Septic Tanks	The solid portion of the excreta is retained on site in septic tank while the liquid portion of the waste is drained from the site in a small diameter sewer	• System is hygienic and free of flies • Toilet may be placed indoors • System can be used in high density areas	• High operation and maintenance requirements • High O&M costs

1.4 Project Institutional and Implementation Arrangements

1.4.1 *Ministry of Natural Resources and Energy*

Responsibility for management of the WSS sector lies with several entities. The Ministry of Natural Resources and Energy (MNRE) is responsible for sustainable water management as well as sustainable provision of water services in the Kingdom of Eswatini (KoE). The Department for Water Affairs (DWA) is an agency of the MNRE tasked with management and oversight of water resources and rural water services provision in Eswatini, including regulation. The DWA has three units: Water Resources; Rural Water Supply; Hydrogeology and Drilling.

1.4.2 *Eswatini Water Services Corporation-Project Implementation Unit*

The Eswatini Water Services Corporation (EWSC) is a Public Enterprise wholly owned by Government operating under MNRE with the mandate to provide water supply as well as sewage treatment and disposal services in the country's largest urban centers. EWSC also controls the abstraction of raw water from boreholes in those areas for which it is responsible. For operational purposes, EWSC has divided its areas of supply into four regions: Central, Northwest, Southwest and East.

The EWSC will have overall responsibility for project implementation and coordination of activities. EWSC has established a project implementation unit (PIU), which includes a manager/coordinator and key specialists in the areas of engineering, environmental, social, procurement and financial management. In addition to these specialists, the PIU will also include sub-coordinators from DWA, EHD-MOH, and NDMA.

The PIU will be responsible for preparation of consolidated workplan, procurement, financial, technical, environmental and social related documentation required for the project, as well as for the overall project monitoring and evaluation and preparation of progress and financial reports for the Project. Specifically, the PIU will prepare site specific ESMPs for the construction of septic tanks in the educational and health facilities in accordance with ESS1. The PIU will also oversee the implementation and monitoring of the ESMP.

A Project Operations Manual (POM) describing all processes, procedures, roles, and responsibilities related to project management and implementation will be prepared by the PIU within 3 months after project effectiveness.

1.4.3 *Environmental Health Department*

The rural water supply unit closely coordinates at the operational level with the Environmental Health Department (EHD) of the Ministry of Health (MoH), who is responsible for the coordination of the overall sanitation and hygiene sector in rural and peri-urban areas, around the construction of latrines in the same communities, as well as hygiene awareness programs.

The EHD also cooperates with the Ministry of Education and Training to provide improved sanitation and hygiene services at school level. EHD activities comprise the support for construction of pit latrines in the rural areas where it provides technical support for construction of facilities and material provision. Behavior change and education promotion on proper use of drinking water and sanitation facilities are also done through this department.

The EHD will identify households, education and health facilities to benefit from the sanitation infrastructure. Further, the EHD will prepare project briefs for submission to the PIU/EAA to determine category of the investment and will conduct training and capacity building targeting households on construction of pit latrines including sanitation hygiene and use of the facilities.

1.4.4 *Eswatini Environmental Authority*

The Government of Eswatini places the responsibility of environmental protection on EEA as the coordinating agency. EEA is charged with the overall role of providing oversight in regard to monitoring for all project activities that have potential impacts on the environment in Eswatini. EAA will provide Environmental Compliance Certificate (ECC) for proposed sanitation projects and specifically the septic tanks to be constructed in schools and health facilities which are falling under category 1 hence only requiring ESMP. Household pit latrines may not require any further environmental analysis but will comply with the EHD's guidelines for construction of pit latrines (see annex B). Without EEA's approval implementation of the investment project will not move forward.

1.4.5 *Project Implementation Arrangements*

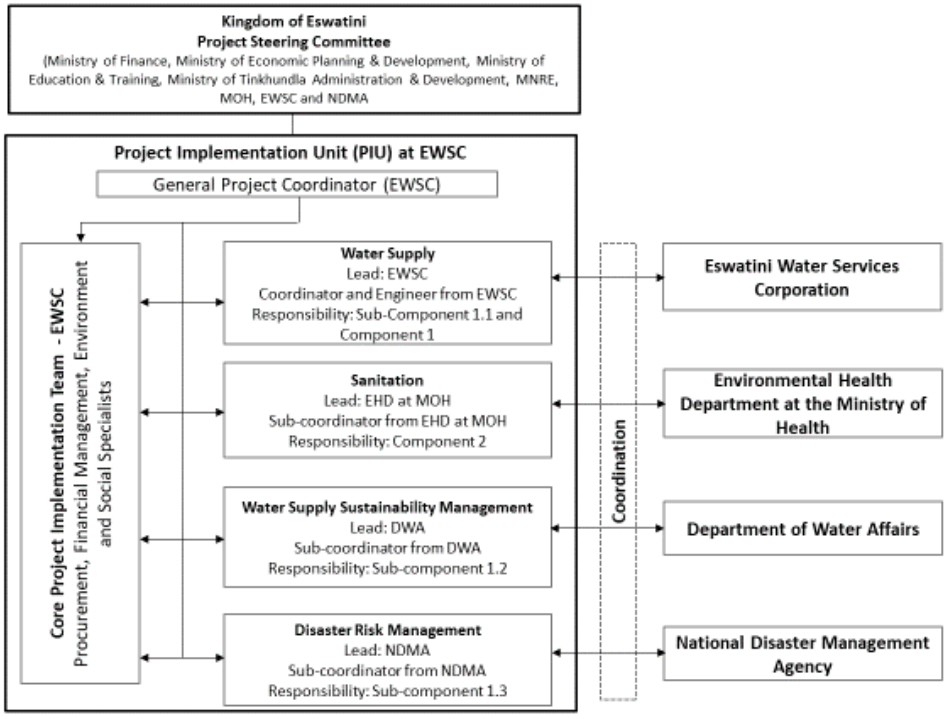


Figure 1-1.Project Implementation Arrangements

2. STUDY METHODOLOGY

2.1 Literature Review

Review on the existing baseline information and literature material was undertaken and helped in gaining a further and deeper understanding of the proposed project. A desk review of the Kenyan legal framework and policies was also conducted in order to the relevant legislations and policy documents that should be considered during project implementation. Among the documents that were reviewed in order to familiarize and further understand the project included:

Eswatini's Legislative Documents

- Constitution
- Environmental Management Act
- The Environmental Audit, Assessment and Review Regulations, 2000
- Water Act
- Land Act
- Public Health Act
- Occupational Health and Safety Act
- Other relevant baseline documents

World Bank Related Documents

- World Bank Draft Project Appraisal Document (PAD)
- World Bank's Applicable Environmental and Social Standards

Project Area Reconnaissance

During the preparation of the ESMP, site visits were undertaken in the region and specifically in the 3 areas with the objective of understanding the general bio-physical and socio-economic environment where the sanitation facilities may be installed.

2.2 Consultations

Stakeholder consultation formed part of the methodology in preparing this ESMP where the project interested and affected stakeholders who could be identified at this early stage were consulted. Public consultation and meetings have been made; one in each of the three areas (Tinkhundla) affected with the purpose of allowing members of the public to raise their concerns and likewise inform the preparation of the ESMP. More information is available in Annex A and chapter 9.

The issues raised and concerns expressed including possible mechanisms of addressing these issues and concerns are discussed in chapter 9. The stakeholder consultation was significant to the preparation of this ESMP and formed the basis for the determination of potential project impacts and design of viable mitigation measures.

2.3 Preparation of ESMP

Preparation of the ESMP for component 2 shall included the following stages:

- Collation of baseline data on the environmental conditions of the project area ;
- Identification of positive and negative environmental and social impacts of sub projects under component 2;
- Identification of environmental and social mitigation measures and management plan;
- Preparation of screening procedures for sub project proposals;
- Formulation of environmental and social indicators and monitoring plans.

3. LEGAL, REGULATORY AND INSTITUTIONAL FRAMEWORK

This chapter identifies the applicable lender requirements and national standards.

3.1 Legal Framework

Table 3.1 below provides a summary of the legal and regulatory statutes in Eswatini which are relevant to this project and which the project will need to comply with and has informed the preparation of the ESMP. The annex B contains a detailed description of the statutes and regulations.

Table 3-1. Legal and regulatory Framework

Statute	Relevance
Constitution of Kingdom of Eswatini	Obliges the Kingdom to in the interest of the present and future generations, to protect and make rational use of its land, mineral and water resources as well as its fauna and flora, and shall take appropriate measures to conserve and improve the environment.
Environmental Management Act No. 5 2002	The stated purpose of the Environment Management Act, 5 of 2002 (s4) is to provide for and promote the enhancement, protection and conservation of the environment and where appropriate, the sustainable management of natural resources. In section 9 the Eswatini Environment Authority is established and its functions.
Environmental Audit, Assessment and Review Regulations, 2000.	These regulations issued under the Eswatini Environmental Authority Act, 1992 and Environmental Management Act, 2002; underline processes that must be taken for any proposed project in order to predict and evaluate likely environmental impacts under studies such as the ESIA.
Public Health Act	The Act defines the Authority for prescribing and enforcing preventative and remedial measures for the protection of public health in Eswatini.
Flora Protection Act of 1958	This Act promotes the conservation and protection of certain plants, through the use of a Schedule, trees, shrubs and vegetation and any living or dead portion of plants from destruction.
Human Settlements Authority Act of 1988	The act established the Human Settlements Authority and its objects and functions. It

	provides policy support to Government and the orderly development of human settlements by allowing for and outlining procedures for the establishment of Human Settlements.
Factories, Machinery and Construction Works Act of 1972	The act deals with the regulation of working conditions and the use of machinery at factories and construction sites.
Workmen's Compensation Act of 1983	The Act provides for the compensation and medical treatment of workmen who suffer injury or contract work-related diseases in the course of their employment.
Occupational Safety and Health Act of 200	The Occupational Safety and Health Act provides for the safety and health of persons at work and at the workplace, and for the protection of persons other than those at the workplace against hazards to safety and health arising from work activities.
Building Operations Regulations of 1969	The regulations control building activities and the safety of buildings.
Factories, Machinery and Construction Works Regulations of 1974	The regulations control health and safety working conditions and the use of machinery at factories and construction works.
Standard Building Regulations of 1969	These regulations provide for the control of building activities and the safety of buildings. Relevant to this project is Regulation 70 which stipulates that no lavatory or pit latrine shall be constructed within 30.5 m of any water source.
Eswatini Building (Grade II) Regulations of 1966	These regulations provide for the control of building activities and the safety of buildings. Of relevance to this project is Regulation 11 which stipulates that no person shall dump or dispose of any debris or rubbish except at such places and in such a manner as may be appointed by the local authority.
Waste Regulations of 2000	The Waste Regulations control the collection, transport, sorting, recovery, treatment, storage and disposal of waste collection and disposal of waste.
Water Pollution Control Regulations of 2010	The regulations control the discharge of effluents exceeding acceptable effluent

	standards for the preservation of water quality.

3.2 Institutional Framework

3.2.1 *Eswatini Environmental Authority*

The key institution involved in the management of environmental impact assessments (EIA) are the Eswatini Environment Authority (EEA) and the Ministry of Economic Planning and Development (MEPD). The EEA, created by an Act of Parliament in 1992, is directed by a management board that sets policy priorities. The format, protocols and procedures of the authority are set out in detail in the First Schedule of the Act. The authority has initiated a process by means of which it would become an autonomous body operating outside of government, but would still largely depend on government funding. This process has been finalised with the enactment of the Environmental Management Act No. 5 of 2002 which establishes EEA as a body corporate with perpetual succession to be successor to the Eswatini Environment Authority established under the Eswatini Environment Authority Act No. 15 of 1992.

The main functions of the EEA are to: -

- Establish standards and guidelines relating to the pollution of water, land and air as well as those relating to noise and other forms of environmental pollution.
- Develop, in cooperation with other government authorities, economic measures to encourage environmentally sound and sustainable activities.
- Promote training and education programmes in the field of the environment to create national awareness of environmental issues.
- Ensure the observance of proper environmental and social standards in the planning and execution of all development projects, including those already in existence, that are likely to interfere with the quality of the environment.
- Initiate measures for the coordination and enforcement of environmental protection legislation.

The septic tanks are falling under category 1 within the EAA's Environmental Audit, Assessment and Review Regulations, 2000 and will therefore require preparation of Environmental Management Plans (EMPs) which will be reviewed by EAA and issued with Environmental Compliance Certificate (ECC) prior to construction.

The ESWC/PIU will procure the services of a competent consultant to prepare these ESMPs once their locations are identified.

4. World Bank Environmental and Social Standards

Eswatini Water and Services Corporation (EWSC) seeks to partner with the World Bank in the development and implementation of this project. The proposed sub projects in component 2 will therefore have to comply with WB Environmental and Social Standards. Projects supported by the Bank through Investment Project Financing are required to meet the following Environmental and Social Standards.

4.1 Relevant Applicable ESSs

The Project will apply relevant World Bank Environmental and Social Standards (ESSs) to protect against adverse impacts on the bio-physical and social environments. The following ESSs are relevant to the project.

Table 4-1.Applicable Environmental and Social Standards

ESS	Description	Applicable
ESS 1.	**Assessment and Management of Environmental and Social Risks and Impacts.** This establishes the importance of integrated assessment to identify the social and environmental impacts, risks, and opportunities in the project's area of influence. This standard requires that social and environmental assessment and management systems are in place for managing social and environmental performance throughout the project life cycle. Its main elements include: (i) social and environmental assessment; (ii) management program; (iii) organizational capacity; (iv)training; (v) community engagement; (vi) monitoring; and (vii) reporting.	**Applicable** because the construction of septic tanks, pit latrines etc could lead to social and environmental impacts, risks, and opportunities in the project's area of influence which need to be identified and managed throughout the project life cycle.
ESS 2.	**Labour and Working Conditions.** It requires that the worker-management relationship is established and maintained, compliance with national labour and employment laws and safe and healthy working conditions are ensured for the workers.	**Applicable** because labour is required for the construction of the sanitation facilities specifically the septic tanks where contractors will be sourced.
ESS 3.	**Resource Efficiency and Pollution Prevention and Management.** This gives an approach to pollution prevention and abatement in line with Internationally accepted technologies and practices with objectives to a) avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from activities; and b) promote the reduction of emissions that contribute to climate change. Under this standard, a project is required to avoid, minimize, or reduce adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities.	**Applicable** when consideration is made to the extent that construction equipment could be sources of air emissions.
ESS 4.	**Community Health and Safety.** It outlines the responsibility to be undertaken by the client to avoid or minimize the risks and impacts to the community's health, safety and security that may arise from project activities.	**Applicable** when considering that construction of sanitation infrastructure could lead to community health and safety risks.
ESS 5.	**Land Acquisition, Restrictions on Land Use and Involuntary Resettlement.** This standard requires that project does not result in involuntary resettlement or at least if unavoidable it is minimized by exploring alternative project designs. It also requires that the project ensures that social and	**Applicable.** Prior to the construction of sanitation infrastructure each site will be screened to determine if EDD5 is applicable. If applicable the activities will be guided by the

	economic impacts from land acquisition or restrictions on affected persons' use of land are mitigated.	Resettlement Policy Framework. The potential sites for the infrastructures are educational and health facilities, and individual residential houses.
ESS 6.	**Biodiversity Conservation and Sustainable Management of Living Natural Resources.** This standard aims to protect and conserve biodiversity, the variety of life in all its forms, including genera, species and ecosystem diversity and its ability to change and evolve; which is fundamental to sustainable development.	**Not Applicable.** The proposed sanitation infrastructures will not be located in biodiverse areas and unlikely to affect biodiversity.
ESS 7.	**Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities-** It recognises the possibility of vulnerability of indigenous people owing to their culture, beliefs, institutions and living standards and that it may further get compromised by one or other project activity throughout the life cycle of the project. This standard underlines the requirement of minimizing adverse impacts on indigenous people in the project area, respecting the local culture and customs, fostering good relationship and ensuring that development benefits are provided to improve their standard of living and livelihoods.	**Not Applicable.** The country does not have undeserved traditional local communities, and as such the application of this standard is limited.
ESS 8.	**Cultural Heritage** It aims to protect the irreplaceable cultural heritage and to guide project proponents on protecting cultural heritage in the course of project operations.	**Applicable** . In cases where the project finds items of cultural importance, notification procedures will have to be followed to ensure protection of cultural heritage of the area and the country.
ESS 9.	**Financial Intermediaries (FIs)** This ESS identifies that strong domestic capital and financial markets and access to finance are important for economic development, growth and poverty reduction. FIs are required to monitor and manage the environmental and social risks and impacts of their portfolio and FIs subprojects. They also develop and maintain, in the form of an Environmental and Social Management System (ESMS), effective environmental and social systems, procedures and capacity for assessing, managing, and monitoring risks and impacts of subprojects, as well as managing overall portfolio risk in a responsible manner.	**Not Applicable.** There are no Financial Intermediaries in this project.
ESS 10.	**Stakeholder Engagement and Information Disclosure.** This ESS recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.	**Applicable.** The proposed project will require extensive stakeholder engagement because its success will depend on how it is received by the communities. In addition, its design will have to be informed by the involvement of the affected communities and other stakeholders. SEP has been prepared and cleared by the Bank and it shall guide stakeholders' engagements/consultations throughout the project cycle,

4.2 Environmental and Social Risk Classification

The Bank will classify all projects (including projects involving Financial Intermediaries (FIs)) into one of four classifications: High Risk, Substantial Risk, Moderate Risk or Low Risk. In determining the appropriate risk classification, the Bank will take into account relevant issues, such as the type, location, sensitivity, and scale of the project; the nature and magnitude of the potential environmental and social risks and impacts; and the capacity and commitment of the ESWC (including any other entity responsible for the implementation of the project) to manage the environmental and social risks and impacts in a manner consistent with the ESSs. Other areas of risk may also be relevant to the delivery of environmental and social mitigation measures and outcomes, depending on the specific project and the context in which it is being developed. These could include legal and institutional considerations; the nature of the mitigation and technology being proposed; governance structures and legislation; and considerations relating to stability, conflict or security.

4.2.1 *Component II Risk Classification-Moderate Risk*

The component II of this project (sanitation) is classified as *Moderate Risk*. Specifically, due to the fact that:

(iii) the potential adverse risks and impacts on human populations and/or the environment are not likely to be significant. This is because the project is not complex and/or large, does not involve activities that have a high potential for harming people or the environment, and is located away from environmentally or socially sensitive areas. As such, the potential risks and impacts and issues are likely to have the following characteristics:

- predictable and expected to be temporary and/or reversible
- low in magnitude
- site-specific, without likelihood of impacts beyond the actual footprint of the project
- low probability of serious adverse effects to human health and/or the environment (e.g. do not involve use or disposal of toxic materials, routine safety precautions are expected to be sufficient to prevent accidents, etc.)

(iv) risks and impacts can be easily mitigated in a predictable manner

4.3 Requirements for Public Disclosure

This ESMP will be disclosed in country through posting on the website for EWSC as well as in the Bank's external website. If there are any changes, a final version will be disclosed in the same manner and places described later. Site specific ESMPs prepared at a later stage will also be disclosed in accordance with the World Bank Policy on Access to Information.

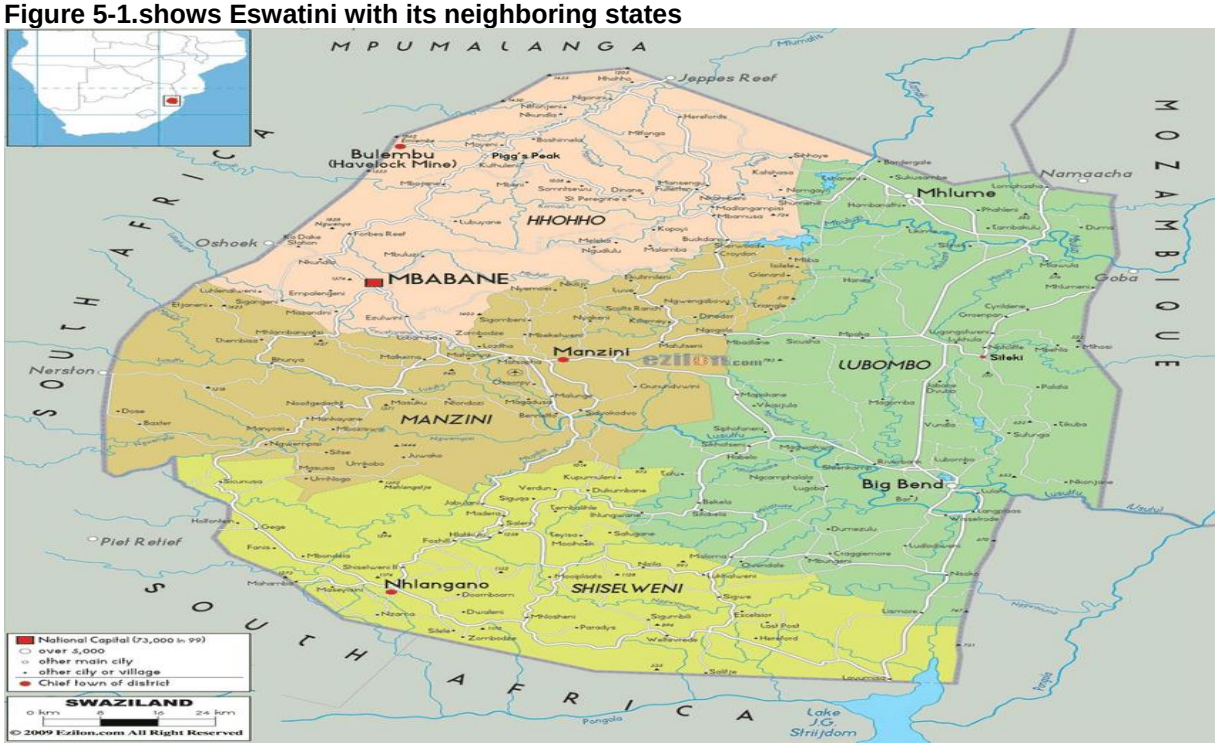
5. BASELINE DATA

This section describes the overall baseline condition in terms of bio-physical environment, as well as the socio-economic.

5.1 Location of the Project Area

The proposed project is located in the Shiselweni Region of Eswatini. The proposed project covers a major part of this region. The largest town in this region is Nhlangano, and this is where all the regional offices are located.

Figure 5-1.shows Eswatini with its neighboring states



5.2 Land Use

The project area is rural, and therefore it mainly consists of settlements. It is sparsely populated, with subsistence crop farming and livestock grazing. In areas from an estimated distance of 10 km from Nhalngano, there is commercial forest called Agro Forestry Development. These plantations have *Acacia mearnsii,* commonly known as black wattle, and pine trees (*Pinus monticola* andsome *Aracaria columnaris)*. The area also has *Psidium guajava,* commonly known as guava trees. There are commercial banana plantations around Mhlosheni.

A few formal business establishments are found in the project area. These include small shops, maize milling operations, butcheries and filling stations. Government establishments found in the area include a police station at Hluthi, Sub-regional Government offices, a number of schools and clinics. The site is near the border with the republic of South Africa, and as such the Lavumisa border gate and Nsalitje border gate are within a 20 km radius of the site.

Figure 5-2. Market Stalls and banana plantations at Mhlosheni

5.2.1 *Surrounding Land use*

The following are establishments that are neighbouring the project area:

- Bahle Benguni Milling
- United Christian Church
- Agro Forestry Development
- Evangelical Church
- Concrete Block Supplier
- Mgazini Nazarene Clinic
- Muna nwar Investments
- Nhlangano Funeral Parlour
- Sibovini Supermarket
- Siphambanweni Milling
- ESIGAS Filling Station
- Kantombanyana Restaurant and Mini Supermarket
- Ka-Lakhumalo
- Swazi Sigwe
- Try Again Supermarket
- Cordan Hardware Store
- Van niekarks Farm
- Lijaha Sisu General Dealer
- Imphilo Butchery
- Gugwane Hardware

5.3 Geology and Soils

The geological map of Eswatini indicates that the geological setting of Nhlangano is made up of 6 groups, the first being dominant in the area is the Nhlangano gneiss a granite gneiss reddish in the Nhlangano area while in Mkhondo Valley are Nhlangano outcrops of gneissoe veined at the margins, homogeneous with a plutonic aspect centrally. A few are folded malic dykes which are upright gneiss domes mantled mainly by Pongola and related rocks. Also characteristic of the area is a few of the Hlatikhulu granite (Htg), Mahamba Gneiss (Mh gn) Mozaan Group (Mz) Mkhondo Valley (MVms) and Dolorite grabbo (do). The Hlatikhulu granite is coarse to medium-grained relicas and xenolithis common in some areas around Hlatikhulu in sheet like form fed from below by dykes and sheets- late pegmelites and mesocralic granite dykes. The Mahamba Gneiss is a semi pelitoc gametilerous gneiss which its correlation is uncertain. The Mozaan group is a basalt about 150m thick. Lastly is the dolorite grabbo and metegrabbo which is mostly dykes of various swarms and ages which a few may be proterozioc or karro.

The arrangement of the soil structure in the project area varies considerably. From Nhlangano to Qinisweni, there are three soil types. It is mostly deep red loam, very acidic soil. Some parts of the soil structure are orange loam, on a soft iron pan. It ranges from ferrisolic to ferralitic. Right after Qinisweni and up to Mantambe, the structure is generally ferralitic; beginning with a Highveld grey on orange which is gravely loam. There are also rock outcrops with stony ground (raw mineral soil) and grey loam on the thick stone line. Moving up to Makhondza area, just before Shiselweni 1, the soil arrangement is deep yellow, loam and very acidic. In some parts, this ferralitic structure is deep pale grey sand on clay. Masiphula area is represented by generally lithosolic rock. It is grey sandy on hard iron pan and shallow grey to sandy loam on hard rock. From Masiphula to Hluthi, the structure of the soil is mostly shallow grey to sandy loam on hard rock, with Highveld grey on orange which is gravely loam and deep red loam, very acidic. Hluthi to Siphambanweni has ferralitic soil which is slightly vertisolic. This gives the soil an acidic dark to deep dark brown clay structure with rock outcrops. It is in some parts marsh, with deep black clay and is calcareous.

The erosion hazard map indicates that soils in Nhlangano area fall between an erosion hazard category 2 and 4 with sub-factors s, r and e. This means the soils in the area are erodible, but at an intermediate rate with contributing factors of slope and rainfall. From Nhlangano town to Galile Primary, the slope is a major contributing factor to erosion. In the area with a steeper slope (such as St Florence Christian High Academy), there is greater erosion power. This area is also susceptible to rainfall erosivity. The flat areas are not susceptible to erosion by slope but during periods of high rainfall in January where most precipitation, the area is likely to experience erosion as a result of rainfall in disturbed areas that have not been rehabilitated. The erosion hazard category ranges from as low as 2 to a medium (3). Galile Primary area has a steep slope too with an erosion hazard category of 4 which is a high medium and soil erodibility due to the nature of the slope. Moving into Hluthi and up to Siphambanweni, the erosion hazard map shows that the soil has an erosion hazard category of 3 with soil erodibility due to slope.

5.4 Climate

The climate is warm and temperate in Nhlangano. In winter, there is much less rainfall than in summer. The wet season is warm and partly cloudy and the dry season is comfortable and mostly clear. Over the course of the year, the temperature typically varies significantly. The average percentage of the sky covered by clouds experiences significant seasonal variation over the course of the year. The clearer part of the year in the area begins around February ending around October. June normally has the clearest day of the year; the sky is clear, mostly clear, or partly cloudy 88% of the time, and overcast *or* mostly cloudy 12% of the time. The cloudier part of the year begins around October, ending around February. November normally has the cloudiest day of the year; the sky is overcast or mostly cloudy 44% of the time, and clear, mostly clear, or partly cloudy 56%of the time. The wetter season lasts between October and March; with a greater than 27% chance of a given day being a wet day. The chance of a wet day peaks at 50% in December. The drier season is usually from March to October. The smallest chance of a wet day is 3% on July. Over the course of July the length of the day gradually increases**.** From the start to the end of the month, the length of the day increases by roughly 23 minutes**.**The graphs below (using data sourced from the

Eswatini Meteorological Department) indicate the average temperatures and rainfall measures between year 2015 and 2018. Data used here was collected from the Mbabane weather station.

5.4.1 *Average Monthly Rainfall of Nhlangano*

Generally, the most rain falls during the 31 days cantered in January and December. But on Figure 10, it is shown that between 2015 and 2018, the highest average rainfall was measured in February (90.5mm). December and March also recorded significantly average rainfall totals of 59.4mm and 75.3mm respectively. The rainless period of the year is between May, June, July and August with average rainfall totals of 21.4mm, 0.4mm, 6.5mm and 9.8mm correspondingly. The least rain falls around June; with an average total accumulation of 0.4mm.

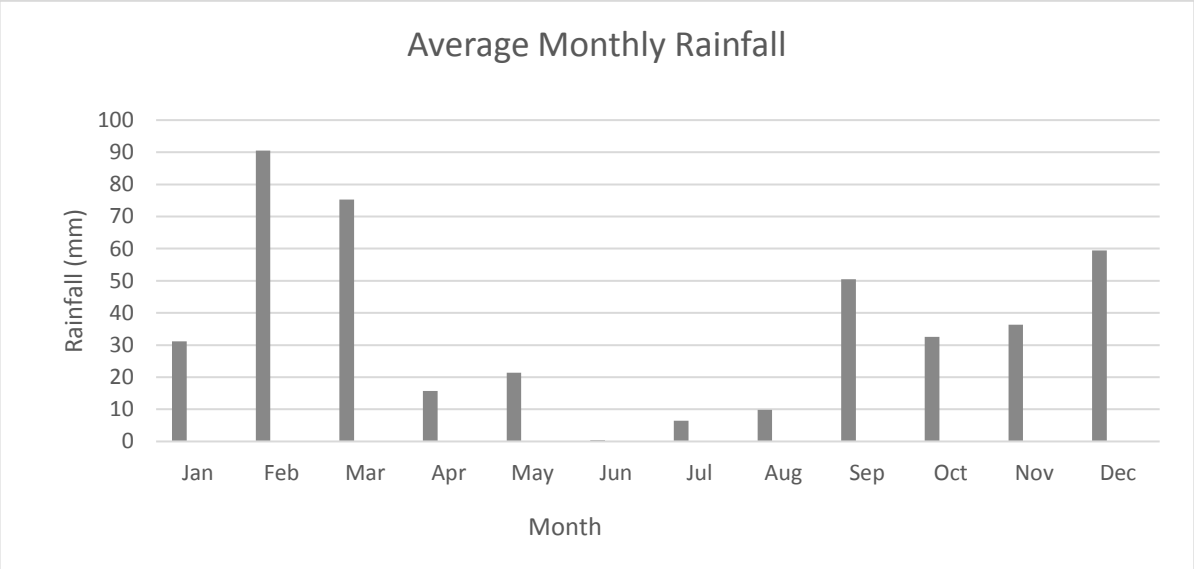


Figure 5-3.Average Monthly Rainfall Measured Between 2015 and 2018 (Sourced from the Eswatini Meteorology Department 2018)

5.4.2 *Average Annual Rainfall of Nhlangano*

Nhlangano experiences extreme seasonal variation in monthly rainfall. The lowest and highest rainfalls at 235 mm and 486 mm respectively. The lowest rainfall was in the 2015 and highest in 2018. This, along with the rainfall totals for 2016 and 2017 is shown in figure below.

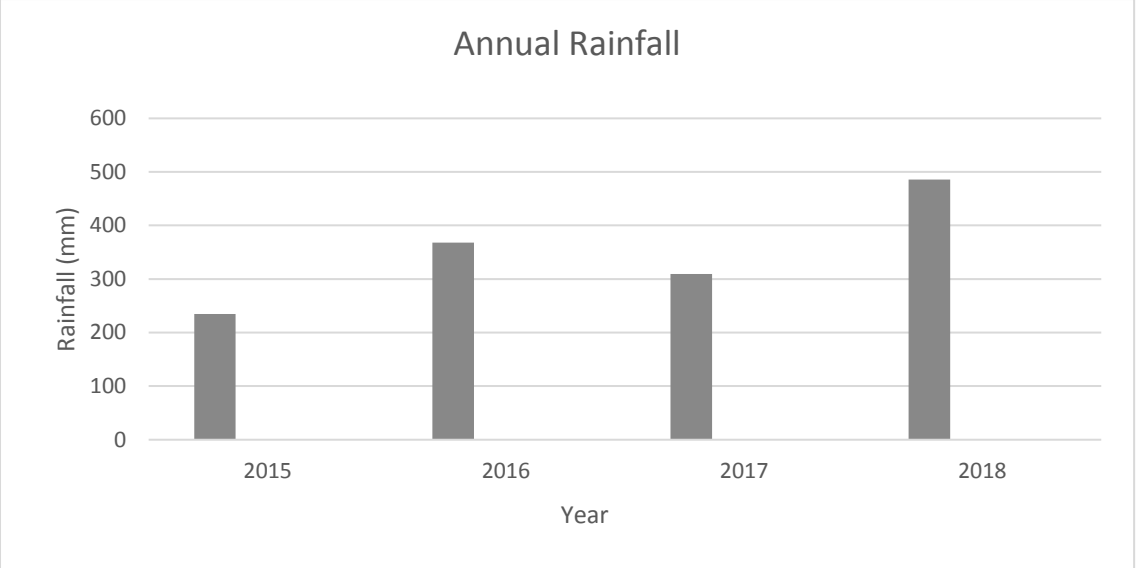


Figure 5-4.Annual Rainfall Measured 2015-2018 (Sourced from the Eswatini Meteorology Department 2018). Temperature

The warm season lasts from December to February; with the highest monthly temperatures at 28.6 Degrees Celsius, 27.9 Degrees Celsius and 28.9 Degrees Celsius in December, January and February respectively. The hottest month of the year is February, with an average high of 28.9 Degrees Celsius. The cool season is normally from May to August with average monthly high temperatures of 10.4 Degrees Celsius, 9.9 Degrees Celsius, 8.9 Degrees Celsius and 10.6 Degrees Celsius in May, June, July and August respectively. The coldest month of the year is July; with an average monthly low of 8.9 Degrees Celsius. Figure below demonstrates the average minimum and maximum monthly temperatures between 2015 and 2018 from January to December.

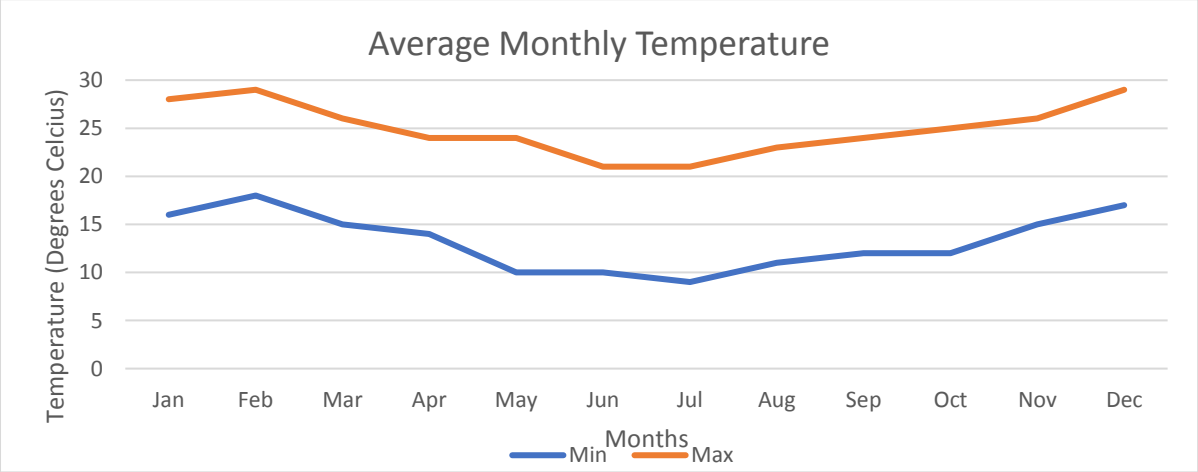


Figure 5-5.Average Monthly Minimum and Maximum Temperatures between 2015 and 2018 (Sourced from Eswatini Meteorology Department 2018)

The subsequent figure (*Figure 5.6*) shows the average annual temperatures from 2015 to 2018. This is to show variation within the years and not just the monthly average totals. The figure shows a drastic decline in the average minimum temperatures; with the lowest temperature recorded in the year 2018. The lowest being 12.1 Degrees Celsius in 2018 while 14.4 Degrees Celsius in 2015. This shows a decrease by 2.3

Degrees Celsius. The maximum temperature dropped marginally to 24 Degrees Celsius in 2017. The temperatures continued to plateau out up to 2018. However, towards the end of 2018, there was a minute increase to 24.1 Degrees Celsius.

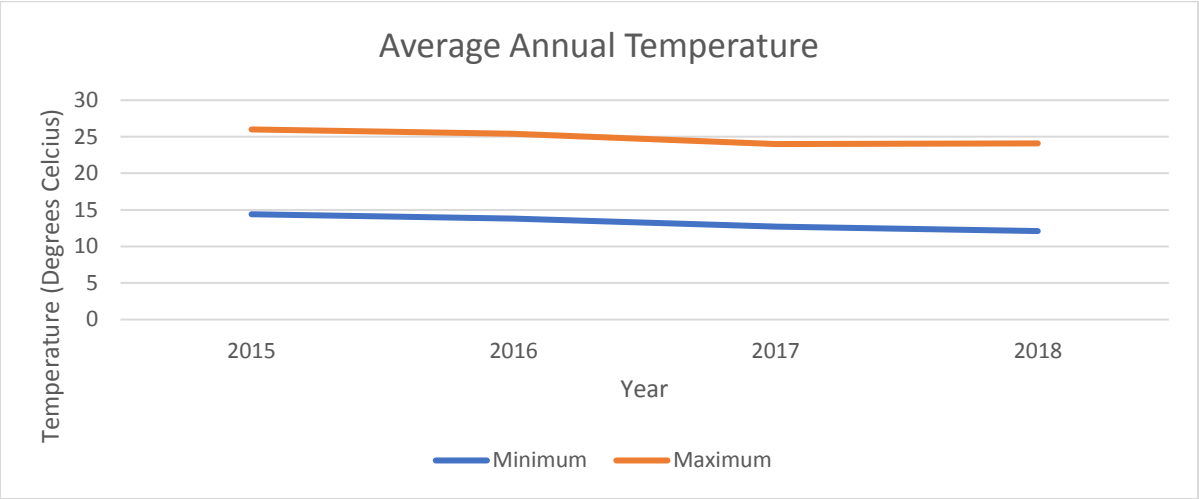


Figure 5-6.Average Annual Minimum and Maximum Temperatures

(Source Eswatini Meteorology Department 2018).

5.5 Topography

Eswatini is oval shaped and bestrides the dissected edge of South African Plateau. The elevation of the country decreases from west to easterly direction. There are four main geographical regions running longitudinal north to south and these are (Microsoft Encarta Encyclopaedia, 2002 and Mwendera, 2003).

- The mountainous westernmost portion, the Highveld, has an average elevation of 900 m to 1400 m and in some places it reaches an altitude of more than 1800 m above sea level;
- The hilly central Middleveld has an elevation of 400-800 m;
- The eastern Lowveld is a rolling area that averages from 120 to 130 m above sea level; and
- The Lubombo Mountains bound the Lowveld on the east.

Significant ridge areas are present in the region of the proposed project.

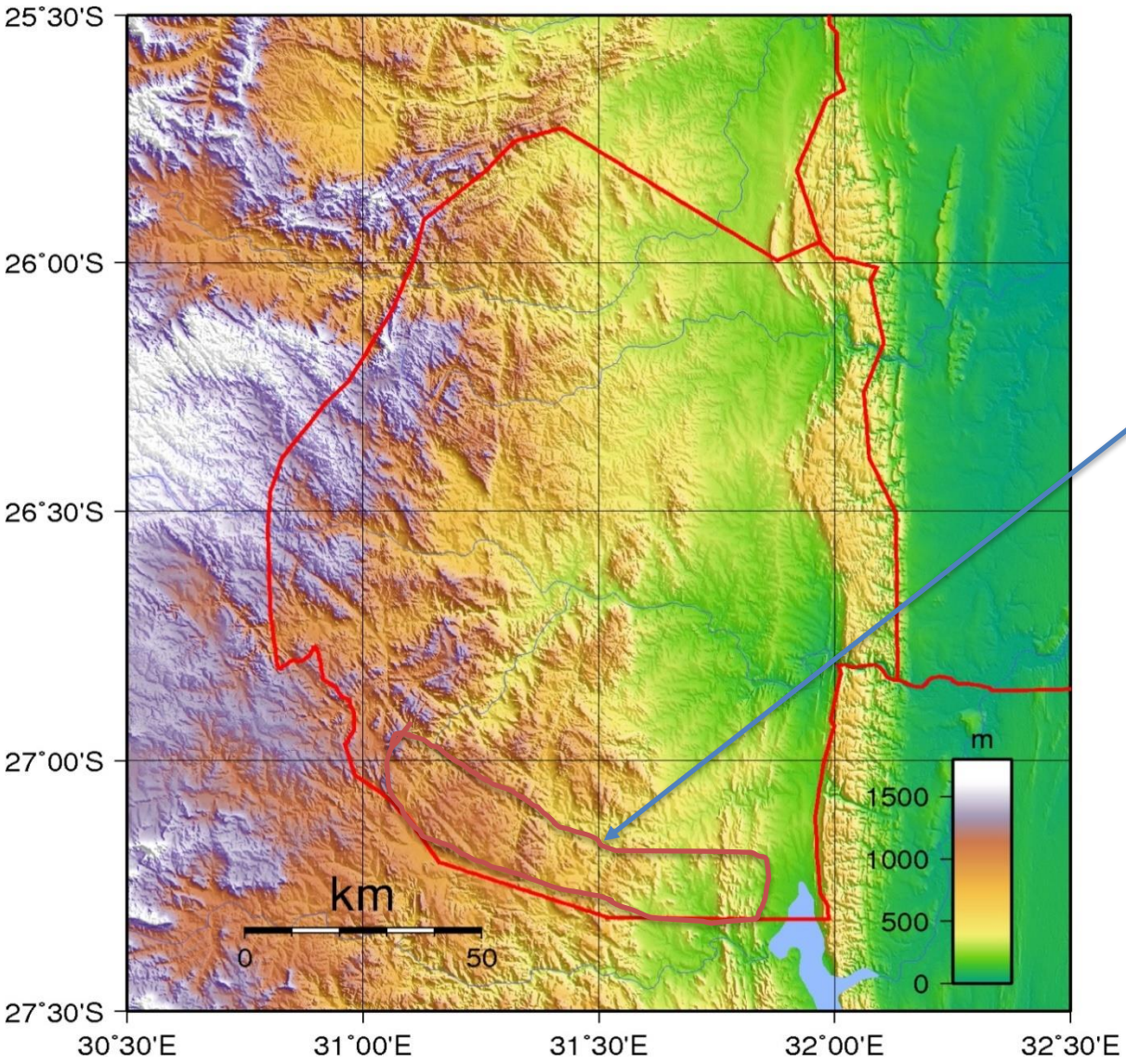


Figure 5-7.Topography of Eswatini

Source: Wikipedia

5.6 Biodiversity

5.6.1 *Flora*

The area has some exotic flora species, like wattle trees and gum trees. This is mainly in the parts where there is commercial forests. The following table outlines the few species that were observed on site.

Table 5-1.List of Flora in the Project Area.

Scientific name	**Common name**	**Siswati Name**	**Comment**
Syzygium cordatum	Water berry	Umcozi	Indigenous
Psidium guajava	guava	Umgwava	Invasive
Lantana Camara		Emehlo akati	Alien invasive species
Pinus sp.	Pine Tree	Umtfolo	Alien invasive species
Sclerochiton harveyanus	Blue-lips	Mazabuka	Weed
Lannea discolor	Live-long	umnTfokolovu	Indigenous
Ozoroa engleri R. & A.Fern	White Resin Tree	imFuce lemhlophe	Indigenous
Ozoroa sphaerocarpa R. & A.Fern	Currant Resin Tree	imFuce lemnyama	Indigenous

Scientific name	Common name	Siswati Name	Comment
Rhus chirindensis Baker f. R. legatii	Red Currant	inHlangushane lenkhulu	Indigenous
Rhus pentheri Zahlbr. R. cuneata	Crow-berry	inHlangushane, Sitsatsatsa	Indigenous
Sclerocarya birrea	Marula	umGanu	Indigenous
Monanthotaxis caffra (Sond.)	Dwaba-berry	siTitane, maSweleti, maSweti	Indigenous
Carissa bispinosa (L.)	Num-num	umVusankunzi, umBethankunzi	Indigenous
Cussonia spicata	Cabbage Tree	umSenge	Indigenous
Chromolaena odorata (L.)	Riffid Weed, Paraffin Weed	Sandanezwe	
Vernonia myriantha	Eared Vernonia, Eared Bitter-tea, Blue Bitter-tea	liNyatselo	Indigenous
Kigelia africana	Sausage Tree	umVongotsi	Indigenous
Eucalyptus spp	Gum tree	Gomu	
Ricinus communis L	Castor Oil Bush	umHlafutfo	Indigenous
Pinus patula var. patula	Pine Tree	Sipheshula	Indigenous
Prunus persica	Peach	uMpetjisi	
Persea americana	Ovacado	uMkotapeni	
Englerophytum magalismontanum		umnumbela	Indigenous
Bidens bipinnata	daisy	Chuchuza	
Alternanthera sessilis	sessile joyweed	Imbuya	Herb
Corchorus argillicola	Jew's mallow	Ligusha	Herb
Pluchea bojeri	sunflower	Nukani, Shashasha	Herb
Vangueria cyanescens	Kalahari wild-medlar	Umntulwa	Indigenous

5.6.2 ***Fauna***

The following fauna species are known to be found in the project area

Table 5-2.Fauna Species in the Project Area

Species	Common name	SiSwati name
Chiroptera spp	Bats	Lilulwane
Lepus saxatilis	Scrub hare	Logwaja
Pronolagus crassicaudatus	Natal red rock rabbit	Logwaja
Cercopithecus mitis	Samango monkey	Ingobiyane
Chlorocebus pygerythrus	Vervet monkey	Ingobiyane
Papio ursinus	Chacma baboon	Imfene
Aethomys chrysophilus	Red veld rat	Ligundvwane
Aethomys ineptus	Tete veld rat	Ligundvwane
Aethomys namaquensis	Namaqua rock mouse	Ligundvwane
Sylvicapra grimmia	Common duiker	Impunzi
Poyntonophrynus fenoulheti	Northern Pygmy Toad	Sicoco
Schismaderma carens	Red Toad	Sigogodvolo
Sclerophrys capensis	Raucous toad	Sigogodvolo

5.7 Water Resources

5.7.1 *Hydrology*

The project area falls within the Usuthu River Basin. The main river flowing through Shiselweni is the Mkhondvo river, which is the source of water supply for the project. Its confluence with the Usuthu River is at Sidvokodvo. The figure below shows the main river basins of the country.

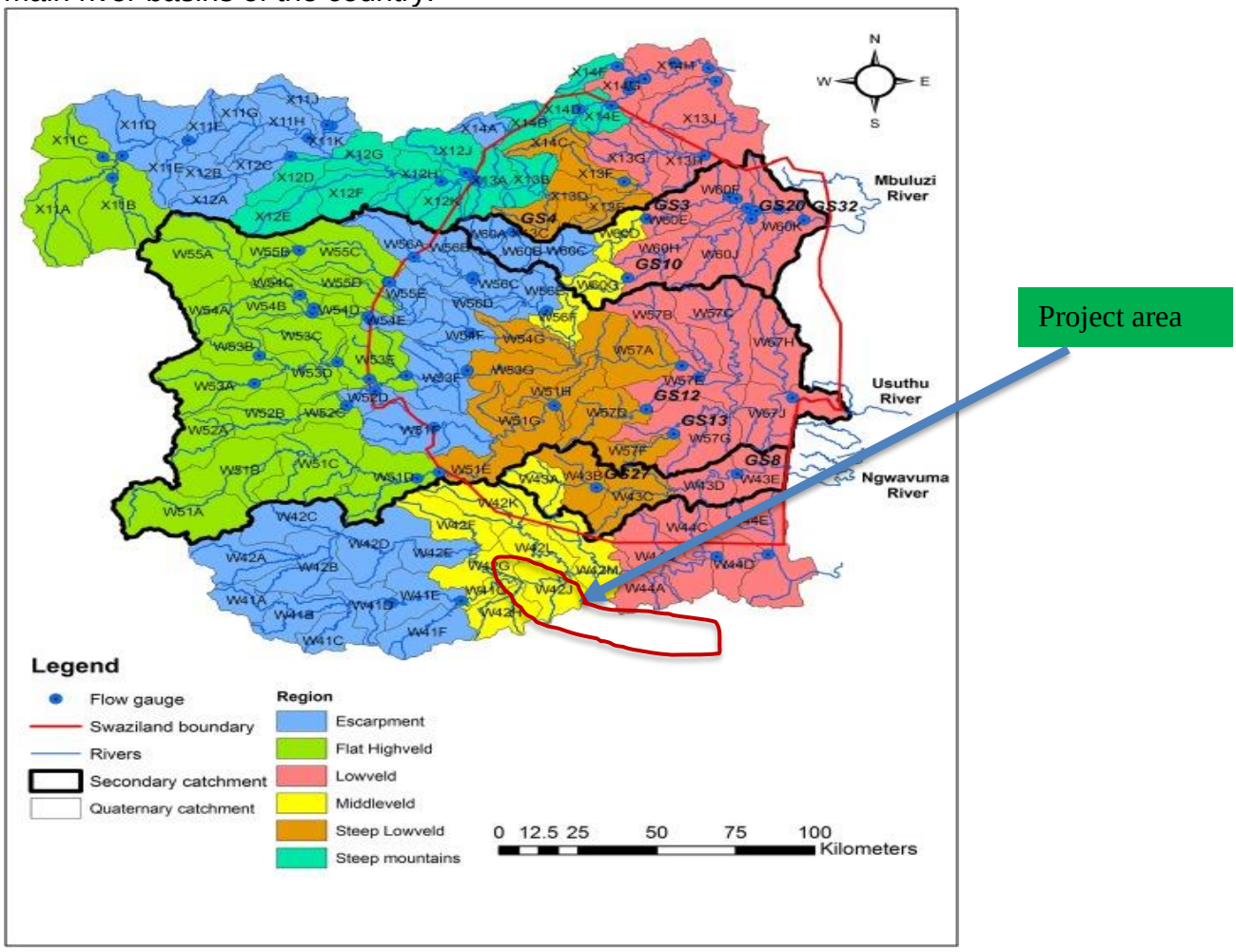


Figure 5-8.River Basins in Eswatini

Along the MR11, there a number of small, seasonal streams namely;

- Mahosha
- Mthongwane
- Mantambe
- Mdakane

There is also a wetland approximately 3km from Siphambanweni.

5.8 Social Environment

5.8.1 *Socio Economic Baseline*

The population of Eswatini is largely rural with the population of Eswatini concentrated in the Hhohho and Manzini regions. Thirty one percent (31%) of the Eswatini's population reside in the Manzini region where the proposed project is allocated. Fifty

three percent (53%) of the Eswatini population are female whilst 47% are male (Central Statistical Office, Volume 3, 2007).

5.8.2 ***Population***

5.8.2.1 *Age distribution*

The combined population of the proposed project areas which include Zombodze Emuva, Hosea and Shiselweni is 38'233 people. Of these 53.6% are female and 46.37% are male. In comparison to the national average the population of Shiselweni region has more people under the age of 14 and over the age of 65 as outlined below. This usually denoted a high dependency ratio as the working age population is smaller than elsewhere.

Table 5-3.Distribution of Population in Shiselweni

Age (Years)	0 -14	15 -64	64+
Eswatini	35.6%	59.9%	4.5%
Shiselweni	39.2%	55.1%	5.7%

(CSO, 2017)

5.8.2.2 *Male to Female Ratio*

The country's male population is higher than females up to the age of 44, after which the female population is higher. The Shiselweni region has the lowest Male Female ratio (89%) compared to the other regions. Higher male population is 24 years and below. This implies a higher emigration ratio of the male population from this region.

5.8.2.3 *Population density*

The population density for Eswatini is 63 people per square metre. Shiselweni region has the third highest population density (54) after Hhohho (89) and Manzini (87), while Lubombo region has the lowest (36). Amongst the 3 Tinkhundlas in the project area, Zombodze has the highest population density (67), followed by Hosea (54), then Shiselweni 1 (42). Amongst the 3, only Zombodze has a population density above the national average.

5.8.2.4 *Education*

The country has a 91% enrolment rate for primary education. At secondary (form 1 to 5), the enrolment rate drops to 51.25%. This may be attributed to the access to free primary education, which then makes the literacy for the country to be 94.61, with males having a higher literacy (95.64%) than females (93.77%). The average money spent on education per household is SZL1, 114.54.

5.8.2.5 *Health*

The total percentage of the population with impairment is at 18.13%. The healthcare affordability for the country is about 80%. The average distance travelled to a health facility is 11.36 km. The national average health expenditure is SZL649.93 per year per household.

5.8.2.6 *Poverty levels*

A majority of the population (58.90%) in Eswatini lives below the poverty line, but only 20.1% live below the extreme poverty line. The percentage working poor is 38.90%. More people living below the poverty line live in the rural areas (70.15%) than urban areas (19.55). Amongst the 4 regions of Eswatini, 67% of the Shiselweni population lives below the population lives below the poverty line, after Manzini (51.07) and

Hhhohho (54.08), while the Lubombo region has the highest percentage at 71.53%. The trend is similar with the population living under extreme poverty. The highest percentage population living below the extreme poverty line is for Lubombo region (33.6%), followed by Shiselweni (21.1%), then Hhohho (18.9%) and Manzini (13.3%). The national poverty gap is 24.9%. The region with the highest poverty gap is the Lubombo Region at 34%. Shiselweni Region has a poverty gap of 28.3%. Hhohho and Manzini have poverty gaps of 22.9% and 19.5% respectively.

5.8.2.7 *Household income and consumption per Capita*

The national average household income per capita is SZL1651, and the consumption average per capita is SZL1074. The percentage entrepreneurship rate is 27.69%. A majority of enterprises (66.45%) have a female decision maker. This indicates that women in Eswatini are more empowered than man to run their own businesses.

5.8.2.8 *Water Supply and Sanitation*

At a national level 29.9% of the population has functional connection to the EWSC grid and a further 11.76% get water from functional community taps. 75.6% use improved sources of drinking water; 12.8% use unimproved drinking water using appropriate treatment methods and 77.43% are engaged in water harvesting. In terms of sanitation 53.68% have access to safely managed; none shared Sanitation facilities. The Shiselweni region as whole lags behind the three other national regions in terms of improved water and sanitation. The following tables indicate the percentage of improved drinking water by region and percentage improved sanitation respectively.

Table 5-4.Improved Sources of Drinking Water by Region

Region	Percentage sources of drinking water
Hhohho	79%
Manzini	79.5%
Shiselweni	***65.7%***
Lubombo	71.9%

(CSO, 2017)

Table 5-5.Improved Sanitation by Region

Region	Percentage Improved sanitation
Hhohho	48.7%
Manzini	43.8%
Shiselweni	***42.3%***
Lubombo.	49.7%

(CSO, 2017).

5.8.3 *Vulnerabilities*

5.8.3.1 *HIV/AIDS*

The key factors that underpin Eswatini's social vulnerability are the devastating impact of the Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) pandemic with national HIV prevalence estimated at 39% in 2006, increasing food insecurities due to persistent drought conditions in certain regions of the country, low economic growth levels (below 2% in 2006/7); shrinking agriculture output and rising unemployment. In 2002 the unemployment rate was 34.2%. The impact of HIV and AIDS, unemployment and rising poverty and the corresponding

decrease in purchasing power exposes many households to food insecurity (pension-watch knowledge centre).

In the Shiselweni region, HIV prevalence was shown to be 37.5% in women and 22.3% in men[8]. A total of 39.7% of people were reported to have comprehensive knowledge of HIV in the region. Sexual behavior that increases the risk of HIV infection, having sex before 15 and having sex with multiple partners, was shown in 5.3% and 16.7% of men and 3.9% and 2.8% of women (aged 15-24 years) [9].

The Government launched an initiative, called “ALL IN”. This initiative is aimed at ensuring that the country attains a National Vision of having an AIDS free generation by 2022. This campaign is also aimed at uniting different sectors in the reduction of AIDS deaths by 65% and reduction in new infection by adolescents by 75% by 2022, and thus set the AIDS movement on track to end the AIDS epidemic among adolescents by 2030.

[8] Swaziland HIV Incidence Measurement Survey, 2011
[9] Swaziland Multiple Indicator Cluster Survey, 2014

6. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT

This chapter analyses the potential positive (beneficial) and negative (adverse) environmental consequences of the sub project investments envisioned under the Sanitation component.

6.1 Beneficial Impacts

6.1.1 *Reduced Spread of Public Health Diseases*

The construction of pit latrines in households will lead to reduction in Open Defecation and achieve Community Total Led Sanitation (CLTS) which will in effect lead to reduction in public health diseases spread by poor sanitation including open defecation.

6.1.2 *Infant mortality*

The project will lead to reduction in infant, child and maternal mortality and morbidity due to improved health and sanitation services in the health units and household level.

6.1.3 *Improved Hygiene For Girl Child*

The construction of septic tanks and toilet facilities in schools will lead to generally improved hygiene in these facilities. There is lack of adequate sanitation facilities in schools equipped for menstruation management. The onset of menstruation coincides with higher dropout rates among female students. Lack of information about menstruation, and the absence of adequate sanitation facilities exacerbates the challenges faced by girls and young women. Poor menstrual hygiene, caused by inadequate sanitary conditions, places adolescent girls at risk of urinary tract infections.10 The project will promote design standards that take into account menstrual hygiene management needs and good practice (separate cabins for boys and girls, safe locks, lighting, presence of disposal bins, and handwashing stations). These activities will be supplemented with a hygiene promotion campaign in schools, with information on menstruation (designed for students and teachers).

6.1.4 *Employment Creation*

The construction of the septic tanks and pit latrines will lead to the creation of employment (skilled and un-skilled) due to the fact that workers will be required for construction purposes.

6.1.5 *Reduced Contamination of Water Resources*

Better and properly sited sanitation facilities at the household level will reduce the risk of contamination of surface and groundwater resources.

6.2 Adverse Impacts

6.2.1 *Site Related Spills*

During construction specifically of the septic tanks where motorized equipment (excavators etc.) may be used, oil spills may result from construction site equipment and storage, which may affect the flora, fauna, soils, and water ways in the area.

Mitigation Measures

[10] Humanitarian Needs Overview, The Kingdom of Eswatini, 2016

- The Contractor should ensure that the employees on site are aware of the company procedures for dealing with spills and leaks from oil storage tanks e.g. using dispersants or adding biological agents to speed up the oil breakdown for the construction machinery though induction and safety training. There will be limited used of motorised equipment during the construction with construction work mainly through manual hand-held equipment.
- In case of spillage the Contractor should isolate the source of oil spill and contain the spillage to the source of leakage before it makes it leaves the affected area, using sandbags, sawdust, absorbent material and/or other materials;
- All vehicles and equipment should be kept in good working order, serviced regularly in accordance to the manufacturers specifications and stored in an area;

6.2.2 *Air Quality*

Construction activities using motorized equipment (septic tanks) including materials delivery, excavation, concrete works and will generate noise and dust. Vehicular traffic emissions will bring about air pollution by increasing the fossil fuel emissions into the atmosphere. However, the construction activities are mainly going to be through manual labour and use of hand-held equipment with limited use of mechanized machines whenever necessary.

Mitigation:

- Use protective clothing like dust masks on construction crew.
- Construction sites a will be water-sprayed on regularly up to three times a day, especially if these sites are in sensitive receptors, such as residential areas or institutions (hospitals, schools etc.).
- All the vehicles and construction machinery should be operated in compliance with relevant vehicle emission standards and manufacturer's specification to minimize air pollution.
- Undertake regular maintenance of generator

6.2.3 *Noise Pollution*

Noise and vibration generated during construction (septic tanks), such as excavators, and transportation vehicles. There will be limited use of construction machinery which will not be heavy in nature. In order to create employment, the project will use manual forms of labour and equipment. Generally, construction noise exceeding a noise level of 70 decibels (dB) has significant impacts on surrounding sensitive receptors within 50m of the construction site. These sensitive receptors include, schools and clinics in the area.

Mitigation:

- Avoid night time construction when noise is loudest. Avoid night-time construction using heavy machinery, from 22:00 to 6:00 near residential areas.
- During the day, construction may be avoided in the health facilities and schools due to the nuisance/noise impact and undertaken during weekends
- No discretionary use of noisy machinery within 50m of residential areas and near institutions, manual labour can be used at this point.
- Good maintenance and proper operation of construction machinery to minimize noise generation.
- Where possible, ensure non-mechanized construction to reduce the use of machinery
- Undertake regular maintenance of generator

6.2.4 *Impacts on Flora and Fauna*

Removal of vegetation will lead to loss of plants and animal habitats. The biodiversity that may be affected includes insects, small mammals, reptiles and birds. This impact is expected to be insignificant in view of the fact that the land requirements for pit latrines and septic tanks is very minimal to lead to degradation of flora and fauna.

Mitigation:

- Re-plant vegetation as much as possible once work is completed.
- Spare the vegetation that must not necessarily be removed such as or replace the trees.
- Minimize the amount of destruction caused by machinery by promoting non-mechanized methods of construction.
- Ensure protection of the flora and fauna by proper handling of cement during civil works.
- The Contractor should ensure that the employees on site are aware of the company procedures for dealing with spills and leaks from oil storage tanks e.g. using dispersants or adding biological agents to speed up the oil breakdown for the construction machinery though induction and safety training (the contractor will propose a method of clean-up which will be subject to approval);
- Provide a waste management plan
- Provision of dustbin and sanitation facilities to prevent seepage into the natural environment.

6.2.5 *Public Health and Safety*

Construction staff and the general public will be exposed to safety hazards arising from construction activities with respect to construction of septic tanks more specifically. The project works will expose workers to occupational risks due to handling of machinery, construction noise and manual handling, etc. Construction activities of vegetation clearing, excavation, materials delivery may generate dust that will pollute the air and this may affect the respiratory system. Construction sites may be a source of both liquid and solid wastes. If these wastes are not well disposed these sites may become a breeding ground for disease causing pests such as mosquitoes and rodents.

Mitigation:

- Contractor to risk asses the project activities, develop and implement relevant C-ESMP which will include but not limited to:
  - An Occupational Health and Safety Management Plan
  - Waste Management Plan
  - Labour influx strategy
  - Gender based violence plan
  - Child protection strategy
  - Employment plans
  - Occupational Health and Safety Plan
  - Spoil management plan;
  - Grievance redress Mechanism;
  - Stakeholders engagement and communication plan;
- Ensure through routing training and induction to all workers and the community on the project risk and the controls developed to manage them;
- Ensure that all construction machines and equipment are in good working conditions and to manufacturer's specifications to prevent occupational hazards.
- Cordon off working areas with a reflective tape to ensure safety of pedestrians and provide crossing areas for access to cut off businesses and structures.
- Appointing experienced and trained occupational health and safety staff, first aiders and fire marshal on-site for the duration of the construction work. (both supervising engineer and contractor)
- Provide workers with appropriate personal protective equipment (PPE).
- Provide a waste management plan
- Fence off the site with security to avoid unauthorized access to the project site (s) and hence potential injuries.
- Provide clean toilets for workers

6.2.6 *Labour Influx*

The Project is expected to stimulate minimal in-migration. Several features of the Project could prompt in-migration. Construction works are also likely to act as a magnet for people and are likely to attract some in-migrants.

The following restorative measures are agreed upon.

- Preparation of Influx Management Plan by contractor
- Preparation of Labour and Recruitment Plan by contractor
- Preparation of a "code of conduct for workers.

6.2.7 *HIV & AIDS Impacts*

In migration of people from different regions may lead to behavioral influences which may increase the spread of diseases such as Human Immuno-Deficiency Virus (HIV), Acquired Immune Deficiency Syndrome (AIDS) and other Sexually Transmitted Infections (STIs).

Mitigation:

- Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS through staff training, awareness campaigns, multimedia and workshops or during community barazas. Provide information, education and communication about safe uses of drinking water.
- Provide an on-site clinic to provide Voluntary Counselling and Testing (VCT) services to construction crew

6.2.8 *Gender Equity, Sexual Harassment*

The construction of the septic tanks will be in schools and the risk of sexual harassment by workers on the school going children is likely to be high. Construction workers are predominantly younger males. Those who are away from home on the construction job are typically separated from their family and act outside their normal sphere of social control. This can lead to inappropriate and criminal behavior, such as sexual harassment of women and girls, exploitative sexual relations, and illicit sexual relations with minors from the local community. Influx of male labor may also lead to an increase in exploitative sexual relationships and human trafficking whereby women and girls are forced into sex work.

Mitigation:

- Ensure all workers sign code of conduct
- Training on Gender Based Violence (GBV)
- Prepare GBV/SEA Action Plan

6.3 Impacts During Operation and Maintenance

The establishment of sanitation system and infrastructure in schools, health facilities and households will be mostly beneficial to the local community. However, the following impacts associated with such facilities may be experienced including:

6.3.1 *Oduor*

The pit latrines and septic tanks if not well sited and maintained will be a source of foul smell that will affect those within the area.

Mitigation:

- Ensure proper siting of septic tanks and pit latrines in accordance with the Eswatini's EHD/MOH guidelines for siting and construction of pit latrines
- Ensure proper maintenance of sanitation facilities including cleaning and hygiene training
- Provide hand washing facilities and water in all the sanitation infrastructures

6.3.2 *Water Contamination*

Faecal matter may lead to underground water contamination if the water table is high or in the case of pit latrines, when there is an overflow due to heavy rains. Contamination of water may lead to outbreak of diseases e.g. cholera, dysentery, typhoid, diarrhoea etc.

Mitigation:

- Ensure proper siting of septic tanks and pit latrines in accordance with the Eswatini's EHD/MOH guidelines for siting and construction of pit latrines
- Ensure proper maintenance of sanitation facilities including cleaning and hygiene training.
- Provide hand washing facilities and water in all the sanitation infrastructures

6.3.3 *Disease Spread*

The area above the slab (i.e., pedestal for sitting or squatting slab) and the pit may contain substantial amounts of pathogens, which vary based on the toilet use, geographical location, and incidence of infectivity. Within the pit, the highest number of pathogens are often found in the top section of the accumulated sludge because it has the most recently delivered excrement; however, pathogens may migrate downwards in the pit or percolate with urine and thus lower parts should not be considered risk-free. Pit latrines can also be breeding grounds for flies and mosquitoes which are disease vectors. Emptying and transportation of faecal matter when pit latrines are full could also lead to pathogen exposure.

Mitigation:

- Ensure proper siting of septic tanks and pit latrines in accordance with the Eswatini's EHD/MOH guidelines for siting and construction of pit latrines
- Ensure proper maintenance of sanitation facilities including cleaning and hygiene training.
- Provide hand washing facilities and water in all the sanitation infrastructures
- Ensure super structures are well constructed and lead to privacy so as to ensure use by family members. Super structures poorly constructed can lead to embarrassment and non-use.

6.3.4 *Hazards*

Super structures if poorly constructed and designed could lead to hazards including falling into the pit if the super structure floor/slab gives ways. This can lead to injury or loss of life.

Mitigation:

- Ensure super structures are well constructed including the slab with the required strength

6.3.5 *Pest outbreak*

Common pests attracted to dirty environment are rats, cockroaches, flies. These animals are also disease vectors. They transport germs from the toilet to nearby human settlement. When they come into contact with human food they cause food spoilage and spread of diseases. Dirty environmental also offer a perfect breeding ground for these pests to multiply.

Mitigation:

- Ensure proper cleaning of toilets
- Ensure and provide training on cleaning of toilets
- Use biopesticides to manage pests

6.4 Environmental and Social Management Process

This ESMP contains potential generic mitigation measures and monitoring indicators through which the adverse impacts for specific sub project investments may be managed. However, site specific ESMP will be developed for the (each) education and health facilities once locations are identified. For household sanitation facilities, there is a likelihood that ESMPs will not be required, instead, construction will have to be consistent with Eswatini's guidelines for construction of pit latrines.

6.5 Mitigation and Monitoring Plan

6.5.1 *Monitoring of Environmental and Social Indicators*

The mitigation and monitoring requirements of the project are summarized in Table 6.1 below.

Table 6-1. Environmental and Social Mitigation Plan

Project Phase	Environmental / Social Impact	Mitigation Measure
Construction	Site Related Oil Spills	• Employee awareness on company procedures for dealing with spills and leaks from oil storage tanks. • Containment of leaks. • Provision of absorbent material • Maintenance of contractor's equipment • Provide training (households) on construction of pit latrines in accordance with Eswatini's Guidelines for construction of and siting of pit latrines.
Construction	Soil Related Impacts	• Stock piling of soil for reuse • Restoration of the ground by sowing adequate grass cover and planting of trees. • Planning emergency response measures in case of accidental oil spills. • Provide training (households) on construction of pit latrines in accordance with Eswatini's Guidelines for construction of and siting of pit latrines.
Pre-construction	Impact on Water Resources	• Provide a waste management plan
Construction		• Proper solid and liquid wastes disposal mainly from the construction sites. • Ensuring proper measures are in place for collection and disposal of spilled oils and lubricants. • Provide training (households) on construction of pit latrines in accordance with Eswatini's Guidelines for construction of and siting of pit latrines.
Pre-construction	Socio-Economic Impacts	• Prepare a labour influx plan to manage labour influx • GBV/SEA Action Plan
Construction		• Hiring unskilled construction and skilled (if available) labour from the local population as far as possible. • Use of manual labour during excavation and construction works where possible. • Sensitizing workers and the surrounding community on awareness, prevention and management of HIV / AIDS. • Provide an on-site clinic to provide VCT services. • Enforcing and maintaining a code of conduct for his employees
Construction	Air Quality	• Use of protective clothing like dust masks on construction crew. • Operated and maintenance of contractor's plant in compliance with relevant vehicle emission standards and manufacturer's specification to minimize air pollution.
Construction	Noise Pollution	• Avoiding night time construction when noise is loudest near residential areas. • Avoid to extent possible construction when schools are in session

Project Phase	Environmental / Social Impact	Mitigation Measure
		• No discretionary use of noisy machinery within 50 m of residential areas and near institutions or use of manual labour in these sections. • Good maintenance and proper operation of construction machinery. • Where possible, ensure non-mechanized construction to reduce the use of machinery
Pre-construction	Impact on flora and fauna	• Provide a waste management plan
Construction		• Re-planting the indigenous vegetation as much as possible once work is completed. • Sparing the vegetation that must not necessarily be removed. • Provide training (households) on construction of pit latrines in accordance with Eswatini's Guidelines for construction of and siting of pit latrines. • Promoting non-mechanized methods of construction. • Ensuring protection of the flora and fauna by proper handling of cement during civil works. • Ensure that the employees on site are aware of the company procedures for dealing with spills and leaks from oil storage tanks • Provision of dustbin and sanitation facilities.
Pre-construction	Public Health and Safety	• Provide a waste management plan.
Construction		• Ensuring proper maintenance and operation of Contractor's plant. • Providing workers with appropriate personal protective equipment (PPE). • Provide workers with adequate drinking water and breaks. • Provide workers training on safety procedures and emergency response. • Cordon off working areas with a reflective tape to ensure safety of pedestrians and provide crossing areas for access to cut off businesses and structures. • Providing clean toilets for workers. • Provide training (households) on construction of pit latrines in accordance with Eswatini's Guidelines for construction of and siting of pit latrines.
Pre-construction	HIV & AIDS Impacts	• Sensitizing workers and the surrounding communities on awareness, prevention and management of HIV/AIDS.
Construction		• Sensitizing workers and the surrounding communities on awareness, prevention and management of HIV/AIDS. • Provide an on-site clinic to provide VCT services to construction crew
Pre-construction	Child Labour and Protection	• Provide a child protection strategy
Construction		• Implement a child protection strategy • Ensuring no children are employed on site in accordance with national labour laws • Ensuring that any child sexual relations offenses among contractors' workers are promptly reported to the police

Project Phase	Environmental / Social Impact	Mitigation Measure

Pre-construction	Gender Equity, Sexual Harassment	• Provide a gender-based violence strategy, which will include:
		  ○ Gender mainstreaming in employment at the worksite with opportunities provided for females to work, in consonance with local laws and customs
		  ○ Grievance redress mechanisms including non-retaliation.
		  ○ Provide and implement an employee code of conduct
		• The works contractor should be required, under its contract, to prepare and enforce a No Sexual Harassment and Non-Discrimination Policy, in accordance with national law where applicable.

Construction		○ Implement gender-based violence strategy
Operation	Odour/Foul smell	• Ensure proper siting of the pit latrine • Provide training to communities on proper use of latrines and hygiene • Provide hand washing facilities
Operation	Water pollution/contamination	• Ensure proper siting of the pit latrine and septic tanks • Provide training to communities on proper use of pit latrines • Provide hand washing facilities
Operation	Exposure to pathogens	• Ensure pit latrines are frequently cleaned • Provide training to communities on proper use of pit latrines • Provide hand washing facilities
Operation	Disease Spread	• Ensure pit latrines are frequently cleaned • Provide training to communities on proper use of latrines • Provide hand washing facilities
Operation	Pest Menace	• Ensure proper cleaning of pit latrines • Use biopesticides • Provide training on proper latrine hygiene
Decommissioning	Decommissioning of old pit latrines/septic tanks	• Ensure that pit latrines are covered when decommissioned to avoid pathogen exposure • Ensure PPE is provided to those demolishing super structures

Table 6-2. Monitoring Parameters

Environmental Component	Performance Indicators	Monitoring Requirements	Frequency of monitoring	Responsibility	Corrective Action
Public health	• Prevalence rates of common diseases. • Availability of adequate solid waste bins.	• Physical inspection • Documentation Number of complaints • Interview with residents	Monthly	Environmental and Social Team from EHD and EWSC	Investigate non-compliance and make recommendations

Environmental Component	Performance Indicators	Monitoring Requirements	Frequency of monitoring	Responsibility	Corrective Action
	• System of safe disposal of both solid and liquid waste in place. • Availability of first aid facilities. • Compliance with the Health and Safety Act.				Implement recommendations
Solid and liquid wastes	• Presence of scattered litter.	• Physical inspection • Number of complaints.	Daily	Environmental and Social Team from EHD and EWSC	Implement recommendations
HIV&AIDS	• Number campaign meetings on transmission of diseases like HIV/AIDS and other STDs. • Number of condom dispensers within the site.	• Inspection of HIV/AIDS prevention services within the site. • Number of condoms, ARVs provided.	Quarterly	Environmental and Social Team from EHD and EWSC	Implement recommendations
Solid and liquid wastes	• Scattered litter • Signs of obstruction of water ways. • Flow of wastewater on the ground surface. • Provision of sanitary facilities to the construction crews.	• Physical inspection • Number of complaints	Monthly	Environmental and Social Team from EHD and EWSC	Implement recommendations
Noise dB(A)	• Level of noise generated. • Provision of PPE. • Compliance with existing noise standard issued by NEMA.	• Liaise with other stakeholders. • Documentation on complaints about noise	Daily (using portable hand-held noise meter	Environmental and Social Team from EHD and EWSC	• Implement recommendations
Air pollution	• Level of dust generated. • Provision of PPE.	• Physical inspection • Interview residents including workers	Daily (using portable hand-held air emission meter)	Environmental and Social Team from EHD and EWSC	• Implement recommendations

Environmental Component	Performance Indicators	Monitoring Requirements	Frequency of monitoring	Responsibility	Corrective Action
		• Liaise with other stakeholders			
Flora and Fauna	• Amount of vegetation removed • Change in animal behavioural patterns	• Documentation of uprooted trees • Observation	Quarterly	Environmental and Social Team from EHD and EWSC	• Implement recommendations
Child Labour	• Record of employees including IDs	• Review of records • Interviews with staff and local community	Monthly	Environmental and Social Team from EHD and EWSC	• Implement recommendations
Gender Equity and Sexual Harassment	• Number of complaints	• Review of grievance redress forms. • Interviews with local community	Monthly	Environmental and Social Team from EHD and EWSC	• Implement recommendations
Loss of Life, Injury and Damage to Private property	• Record of accidents and damages done	• Review of records • Interviews with staff and local community.	Monthly	Environmental and Social Team from EHD and EWSC	• Implement recommendations

6.6 Monitoring Roles and Responsibilities

6.6.1.1 *EWSC/PIU-Environmental and Social Specialist*

The EWSC/PIU has recruited environmental and social safeguard specialists who will provide oversight, in monitoring and evaluation of all the sub projects. In principle the 2 specialists will work with the Environmental Health Department (EHD) to ensure that monitoring of the sub projects are undertaken and findings are reported to them periodically so that needed technical assistance to ensure compliance is provided. They will be required to prepare periodic (quarterly and annual) monitoring reports for submission to the to the Bank.

6.6.2 *Eswatini Environment Health Department*

The rural water supply unit closely coordinates at the operational level with the Environmental Health Department (EHD) of the Ministry of Health (MoH), who is responsible for the coordination of the overall sanitation and hygiene sector in rural and peri-urban areas, around the construction of latrines in the same communities, as well as hygiene awareness programs. The EHD also cooperates with the Ministry of Education and Training to provide improved sanitation and hygiene services at school level. EHD activities comprise the support for construction of pit latrines in the rural areas where it provides technical support for construction of facilities and material provision. Behavior change and education promotion on proper use of drinking water and sanitation facilities are also done through this department.

The EHD will identify households, education and health facilities to benefit from the sanitation infrastructure. Further, the EHD will prepare project briefs for submission to EAA to determine category of the investment and will conduct training and capacity building targeting households on construction of pit latrines including sanitation hygiene and use of the facilities.

6.6.3 *Eswatini Environment Authority (EEA)*

The Government of Eswatini places the responsibility of environmental protection on EEA as the coordinating agency. EEA is charged with the overall role of providing oversight in regard to monitoring for all project activities that have potential impacts on the environment in Eswatini. EEA will undertake periodic monitoring of the investment projects by making regular site inspection visits to determine compliance with the investment projects ESIAs approved and will further rely on the submitted annual audit reports submitted for each investment project annually as required by EMCA as a way of monitoring. EEA will provide approvals and ESIA licence to all the investments based on the ESMP reports submitted, without EEA's approval implementation of the investment project will not move forward. All monitoring reports as well as project compliance reports will be submitted to EEA as specified by the environmental assessment and audit regulations.

6.6.4 *World Bank Monitoring and Implementation Support*

The Bank will monitor the environmental and social performance of the project in accordance with the requirements of the legal agreement, including the ESCP, and will review any revision of the ESCP including changes resulting from changes in the design of a project or project circumstances. The extent and mode of Bank monitoring with respect to environmental and social performance will be proportionate to the potential environmental and social risks and impacts of the project. The Bank will monitor projects on an ongoing basis as required by OP 10.00.44. The project will not

be considered complete until the measures and actions set out in the legal agreement (including the ESCP) have been implemented.

To the extent that the Bank evaluation at the time of project completion determines that such measures and actions have not been fully implemented, the Bank will determine whether further measures and actions, including continuing Bank monitoring and implementation support, will be required.

The Bank will provide implementation support regarding the environmental and social performance of the project, which will include reviewing the Borrower's monitoring reports on compliance of the project with the requirements of the legal agreement, including the ESCP.

7. REVIEW, COORDINATION & IMPLEMENTATION ARRANGEMENTS

The Eswatini's Environmental Management Act (EMA) require that all projects be subjected to a review and screening process in order to determine their categorization and need for ESIA or ESMP. This is done through preparation of a project brief which will be prepared by the EHD jointly with the support of EWSC/PIU.

The construction of septic tanks in schools and health facilities will be reviewed independently for potential environmental and social impacts. The construction of the septic tanks will require preparation of ESMPs since they fall under category 1. This will ensure that environmental sound design including proposed mitigation measures as well as alternatives are incorporated at the design stage hence avoiding design change.

No support to component 2 will be provided until (i) the applicant has presented the WB with a certified copy of the positive conclusion of the relevant national authority or - as the case may be - the World Bank determines that no further environmental review is required, and (ii) the World Bank has reviewed and cleared the environmental documentation and issued its formal no objection.

7.1 Preparation of Project Brief

The Environmental Health Department (EHD) staff will prepare a project brief (see 7.5.1) below which will be reviewed by the safeguard's specialist in the PIU and then submitted to EAA to facilitate assigning of category and determination whether to prepare ESIA or ESMP.

7.2 Preparation of ESMP

The proposed sanitation infrastructures (pit latrines and septic tanks) are falling under category 1 within Eswatini's Environmental requirements and as described in section 7.5 below. Thus, an ESMP is required to be prepared and submitted to EEA for review and approval. The ESWC/PIU will recruit a consultant to prepare ESMPs for identified infrastructures specifically the septic tanks for schools and health facilities and obtain necessary license from EAA prior to commencement of construction. Pit latrines to be sited in households may not require licensing but will instead be guided by the existing guidelines by EHD for siting and construction of pit latrines. The EHD will offer training to households on construction of pit latrines.

7.2.1 *Sample ESMP Contents*

The ESMP for each sub project should at a very minimum contains among others; -

- Description of the possible adverse effects that the ESMP is intended to address;
- Identification of project design alternatives that would meet similar objectives, and a description of why these projects are not viable, especially if they have a lesser environmental or social impact;
- Description of planned mitigation measures, and how and when they will be implemented
- Program for monitoring the environmental and social impacts of the project, both positive and negative;
- Description of who will be responsible for implementing the ESMP; and

- Cost estimate and source of funds.

7.3 Environmental Assessments Process in Eswatini

In terms of section 32 of the Environmental Management Act, 2002, no person shall undertake any project that may have an effect on the environment without the written approval of the Eswatini Environment Authority (EEA). This is done to determine whether any environmental impacts may occur as the project is implemented**.**

7.3.1 *Project Screening and Scoping*

The proponent submits a project brief to the EEA, outlining sufficient information to enable the authority to determine the potential impacts of the development. The authority then assigns a category to the project, depending on the level of impact it may have on the environment. There are 3 categories used to classify projects; category 1, category 2 and category 3.

Category 1

These are projects that the Authority that do not have significant adverse environmental impacts. An Environmental Management Plan (EMP) is required upon categorisation. The EMP outlines the project details and potential impacts on the environment. It also includes mitigation measures to be followed to minimise impacts. Report compilation may take 1-2 weeks. The EEA takes about 2-3 weeks to review it and give feedback. An Environmental Compliance Certificate (ECC) is issued upon approval of the EMP. This project falls under category 1.

Category 2

Category 2 Projects have significant adverse impacts to the environment. These are projects whose environmental impacts may be easily determined and for which there are appropriate, well known and tested mitigation measures. This category requires the compilation of an Initial Environmental Evaluation (IEE). The IEE draws conclusions and makes recommendations on how to improve with environmental performance of the project. Findings of the IEE are used to prepare a plan to implement these recommendations and monitor their effectiveness through a Comprehensive Mitigation Plan (CMP). When the IEE and CMP reports are approved by the EEA, an Environmental Compliance Certificate is then issued allowing the proponent to implement the proposed project. Compilation of the report takes about 2-3 weeks; the EEA takes about 4 weeks to review and give feedback.

Category 3

This category is assigned to projects whose environmental impacts are anticipated to be significant but cannot be easily determined. They require detailed specialist studies and extensive public participation. They need an Environmental and Social Impact Assessment (ESIA) process.

A summary outline of the process is shown below.

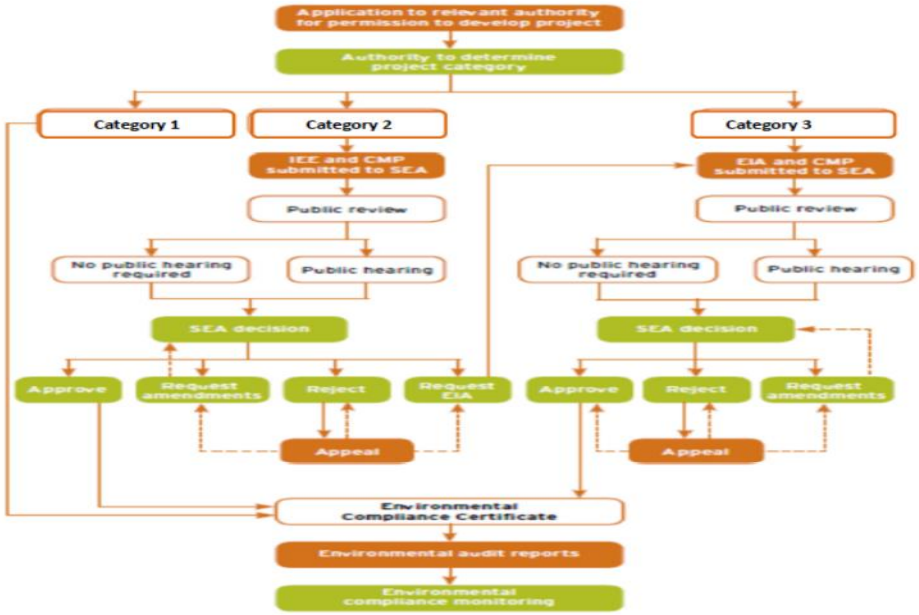


Figure 7-1.Illustration of the Environmental Process in Eswatini

7.4 World Bank Approval of ESMPs

The site specific ESMPs prepared and submitted to EAA for approval by the EWSC/PIU will also be submitted to the Bank for review and clearance.

7.5 ESMP Disclosure

The World Bank disclosure standards require that ESMP report for the project is made available to project affected groups, local NGOs, and the public at large. Public disclosure of ESMP document is also a requirement of the Eswatini environmental procedures. EWSC/PIU will make available copies of the ESMPs on strategic locations and offices of the ministries. Public notice in the media should be used to serve as information source to the public. The ESMPs will also be disclosed on the World Bank's external affairs website.

7.6 Overall Project Compliance and Reporting

This ESMP will be implemented by the EWSC/PIU in collaboration with the EHD with the ESWC/PIU taking full responsibility of all environmental and social risks including ESMP implementation and monitoring. The EHD will collaborate with the environmental and social specialist within the EWSC/PIU and the World Bank to ensure effective execution.

8. PUBLIC CONSULTATION AND DISCLOSURE

8.1 Public Consultation Process

In the preparation of this generic ESMP, consultations were held with stakeholders in the proposed project region.

Stakeholder consultation formed part of the methodology in preparing this ESMP where the project interested and affected stakeholders who could be identified at this early stage were consulted. Public consultation and meetings were made; one in each of the three areas (Tinkhundla) affected and a scoping meeting held with the purpose of allowing members of the public to raise their concerns and likewise inform the preparation of the ESMP.

At the inception of the ESMP process, the Development Teams from each benefiting community were engaged. Meetings were also held with the Ministry of health, which is driving the sanitation part of the project. Consultations were conducted at Regional level (Shiselweni Region Development Team) and further condensed to Constituency level (Zombodze Emuva Inkhundla Development Team, Hosea Inkhundla Development Team and Shiselweni 1 Development Team).

Site notices were erected at various noticeable locations along the MR11 corridor (Nhlangano - Siphambanweni) to advertise the planned scoping meeting. The purpose of these notices was to raise awareness about the planned scoping meeting, for optimal participation. A4 size site notices in both English and Siswati were placed in the site, especially population concentrated areas (Hluthi Police Station, Siphambanweni Water Kiosk, Market Stalls and multiple Bus Stop Shelters along the aforementioned road amongst others), inviting interested and affected members of the public to a scoping meeting as part of the ESMP compilation process.

All information; including details on who was consulted, consultation dates, what was consulted on and general feedback on consultation process, responses, has been included and acts as a record of the communication/public involvement process. Minutes of these consultations have been attached as Appendix A of this report.

A total of five consultative meetings were held and a total of 234 people have attended these meeting on the dates shown under table 8.1, the last meeting was the public scoping meeting.

Table 8-1: Public consultation meetings

Meeting	Date	Venue	Number of participants
Shiselweni Regional Development Team	14 March 2019	ESWC Regional office auditorium	50 Attendees: 29 males, 21 males
Zombodze Emuva Constituency	16 March 2019	Zombodze Emuva Constituency Building	35 attendee, 21 males, 14 females
Hosea Constituency	23 March 2019	Hosea Constituency Building	43 Attendees: 29 Males, 14 females
Shiselweni 1 Constituency	30 March 2019	Shiselweni 1 Constituency Building	50 Attendees: 25 males, 25 females
Hluthi Police Station - Conference Room (Scoping Meeting)	04 April 2019	Hluthi Police Station - Conference Room	47 Attendees: 35 males, 12 females

During these consultations, a powerpoint presentation was done by the EWSC's Project Manager; Mr Bongani Mdluli and the Corporation's Public Affairs Manager Ms Nomahlubi Matiwane explained the aim of the meeting which was to;

- Provide background information about the proposed water supply and sanitation project (project brief)
- Gather feedback and identify stakeholders' interests
- Address social, technical and environmental issues

Meeting attendees were then allowed to voice their comments and seek clarifications. Participants were asked for their perceptions and expectations with respect to the proposed project and in particular the location of kiosks along the project area for ease of accessibility. They were also asked to indicate the main challenges they face as a result of the unavailability of potable water in the area. Issues of sanitation were also discussed as perpetuated by the lack of clean water.

The issues raised and concerns expressed including possible mechanisms of addressing these issues and concerns are shown in the tables below. The tables present all the issues and responses provided during the public consultation for the whole project, since a number of issues are pertinent to all components of the project. The stakeholder consultation was significant to the preparation of this ESMP and formed the basis for the determination of potential project impacts and design of viable mitigation measures.

Table 8-2. Issues and Response from Public consultations

Category	Question	Response
Project Timelines	1. When will the World Bank approve the project for implementation. 2. How long after approval will implementation commence? 3. After receipt of approval from the Bank, may EWSC work speedily to complete this project?	The World bank will meet to consider the project for funding in July and communicate decision to EWSC soon after that. After approval, there will be an appointment of design consultants to make detailed designs, which will take 6-12 months. The contractor will then be appointed to start the construction. EWSC will ensure that there are no delays after approval of eth project for funding and run processes in parallel where possible.
Resettlement & Compensation	1. Will there be compensation due to movement of water network through privately owned land?	Privately owned land that is affected will be compensated after extensive consultations with property owners, using national and international guidelines. Compensation will be done in accordance with national and international guidelines. No civil work shall commence unless compensation and Resettlement Assistances are paid to Project Affected Persons (PAPs)
Employment	1. What benefits will the community receive e.g. job opportunities? 2. Are there any laws that address payment of unskilled labour?	Locals will be given first preference, depending on the availability of their skills. The contractor will be advised to ensure non skilled labour is sourced from the community. Unskilled labour will be sourced from the Tinkhundla in the area. Appointed Community Liaison Officer (CLO) will assist. Companies, contractors included, are expected to comply with labour laws of the country to ensure that salaries paid to workers are above the minimum wage.
Movement of Laterals	1. How will the pipe laterals move from the Left Hand Side (LHS) to the Right Hand Side (RHS)?	To minimise disturbance to traffic, the design will use storm water culverts that cross under the roads.
Water Abstraction	1. Has a water abstraction permit been obtained? 2. How does EWSC plan to continuously provide water in cases where	The water abstraction permit for the existing Masibini water treatment plant has more water allocation than is currently abstracted. The required volumes from this project will still be within the allocated quota.

	Mkhondvo River levels are significantly low?	
ESIA Process	Once Environmental Compliance Certificate (ECC) has been issued out by the EEA, can EEA evoke the Certificate due to concerns from the public?	The EEA does not revoke the EEC before doing extensive consultations and engagements with concerned parties. It is after that exercise has been exhausted that the EEC may be revoked, but also based on valid environmental non compliances.
Socio-economic Issues	1. Can child-headed families who cannot afford meter installation fee be given a discount? 2. Do water charges differ in the rural areas compared to the urban areas?	The project does not give preferential treatment for installation cost to disadvantaged groups. However, the provision of kiosks, which provided water at E0.20 per litre, makes a provision for disadvantaged groups to access water at minimal cost.
Water Kiosks	1. Will multiple Water Kiosks be placed in densely populated areas?	Location of kiosks will be based on ease of accessibility, population coverage and also the need to have individual kiosks service multiple people to sustain the business. areas with a high density of less privileged people will also be considered first. The placement and number of kiosks will be done in consultations with community and will ensure maximum coverage in these communities.
Pipeline Coverage	1. What is the estimated number of people to be provided with potable water in this project? 2. How will the water reach homesteads away from the MR 11 corridor? 3. Are there any pump stations along the network?	The estimated population of 20,000, and up to 50,000 people are expected to benefit from this project. There will be laterals that will be constructed to feed communities that are not in close proximity to the highway, as shown in the project layout drawings presented. EWSC provides 15m coverage from main pipe to homes. Individuals who fall beyond the 15m can acquire a quotation from EWSC to bring meter closer to their homes. Quotation is based on the number of additional metres required by the client. Most of the water will be driven by gravity because the pipeline is from an area of higher latitude to lower altitude. However, because of the different laterals, the pressure will need to be boosted by pumping. Only one solar powered pump

	4. Is an individual allowed to buy a similar pipe grade for movement of meter within his/her home instead of those provided by EWSC to avoid high installation costs? 5. Will the network cover Bambitje area? It has been previously left out and is in desperate need for potable water.	station is proposed, opposite St Florence Christian Academy due to extremely steep slope. The Corporation does not encourage that the public buys their own pipes, because the quality may be substandard. EWSC encourages the use of SABS approved pipes. Water pipes sold in most local hardware shops cannot withstand the velocity at which the water flows and will therefore lead to bursting of the pipes. Bambitje has been included in this project.
Appointment of Contractor	1. Contractor appointed in a similar project in Lavumisa did an exceptional job. Can he be appointed for this project?	The procurement of the contractor will follow standard EWSC procurement procedures, and equal opportunities will be given to contractors
Existing Water Committees and Schemes	1. Will existing multiple water committees and community water schemes be dissolved for the formation of new committees to assist in implementation? 2. Some people have already paid in water schemes, what is the way forward?	For ease of sustainability, water supply from EWSC should not be supplementary to other water supply projects. One member from the various water committees in each Inkhundla can be selected for the formation of a water committee to work with EWSC. The project will give an option for people to access water. It will not compel people to change form their schemes if they prefer to stick with them.
General	1. Request for EWSC to open a branch in Hluthi 2. Who digs and buys the pipes for supply in homes?	The suggestion was noted and would be taken up with the leadership of EWSC EWSC does the installation of the bulk infrastructure up to the water meter. The plumbing from the water meter to the houses is done by plumbers that are engaged by home owners.

8.1.1 Consultation with women

A number of focus group discussions were held to solicit input of various groups in the project area. Focus group meetings were with women (25 women at Shiselweni 1 Inkhundla, 10 at Lushini and 13 at Mchinsweni communities). Table 8.3 below summarizes comments and issues from women's groups.

Table 8-3. Issues Raised by Women focus group

Category	Comment/Issue
Existing water supply schemes	Existing stand-pipes within their community are unreliable. When this happens, the community has no choice but to return to unsafe sources such as rivers. Although technically they are near to safe water sources these are often shut down. These water schemes were implemented by Rural Water Supply Branch and as is the norm, community members had to put down a joining fee to be part of the scheme as well as provide labour for the installation of pipes. Some schemes are said to be non-functional at least once per month for a couple of days at a time even though community member are paying E10 per month.
Water Availability	Each person is allowed a 20litre container at a time at the borehole pumps. If there are many people at the borehole the process is slowed considerably.
Water quality	The water is drawn from an earth dam that was built so respondents are not sure how clean it is. Water from the boreholes is sometimes muddy.
Affordability	There is concern in the community that some will not be able to afford to pay their bills which in the past has affected neighbours. For this reason, the kiosk is the preferred means of getting safe potable water.
Access to water supply	The elderly find it increasingly difficult to fetch water or use an outdoor toilet. For many the option of indoor plumbing is desirable as even the water kiosk is considered far for some. Those who live with or near sick or elderly people are concerned to ensure they leave enough water for the day. Some respondents claim that they sometimes queue for water from 3am to 7am before they can return home. Those who have transport make use of the EWSC water kiosk at Nsalitje.
Sanitation	VIP toilets had to be built by homesteads in order for them to be eligible for the Rural Water scheme but many of these quickly fell into disrepair because they were done hurriedly to facilitate the project. Some have hand-washing facilities but most do not.
Maintenance of water supply infrastructure	Community members are further frustrated because they have to constantly maintain clogged pipes and repair burst pipes or other infrastructure which they provided labour to install in the first instance.
General	As carrying water is cumbersome, most opt to wash the cloths at the river rather than at home. This time-consuming task means other household chores are put on hold. The availability of water closer to the homestead is seen as a timesaving intervention where additional activities such as cooking, and watering livestock can be carried out simultaneously.

Category	Comment/Issue
Waste management	Disposable nappies are littered all over the community in dongas and even along the side of the road. The preference to disposable nappies is said to be nothing to do with the availability of water but the allure of 'modern' living.

Recommendations from women's groups were:

i. The project should use local labour for their ('our') projects and were keen to know if the kiosk would provide more long-term employment.
ii. They are eager to learn more about water conservation with a view to reducing costs.
iii. They are looking forward to having the water project implemented and they wold protect against anyone who stopped a water project.

8.1.2 Consultation with Rural Health Motivators

Rural Health Motivators are generally regarded as the most knowledgeable community members with regards to water and sanitation having been trained on WASH issues by government and non-governmental organisations over the years. Rural Health Motivators (RHMs) were also consulted to solicit their views on the project. These are community people that work with the Ministry of Health to promote health issues and play a liaison role between the Ministry of health and the community. Table 8.4 provides a summary of issues raised by RHMs in the project area.

Table 8-4. Issues raised by Rural Health Motivators

Category	Issue raised
Need for the project	Expressed gratitude for the project No single home in Bambitje community has a water connection Water kiosk is the first priority so that everyone in the community can have access to clean potable water. The respondents request that ESWC consult them with regards to the site of the proposed kiosk. Then those who can afford to can opt for individual connections.

Category	Issue raised
Existing water schemes	Though there have been boreholes with communal hand-pumps in the area these are not maintained Not reliable
Water availability	Most people collect water from the river which they share with livestock Now even the rivers are drying up so that in many places people have to dig for water. There is so little water to spare that one respondent remarked that 'people do not even offer water to travellers if they ask – we pretend not to hear.' Respondents also observed that the availability of water at home or close to home would allow them to be more efficient in their chores.
Water reuse and recycling	The use of 'grey' water for homestead gardens is understood but respondents complain that this water is hardly adequate for viable gardens.
Sanitation	In many areas, percentage of homestead with good, effective VIP toilets in the area has decreased. This is because many of the existing VIPs are old and have become dilapidated or because they are many new homesteads who did not benefit from past interventions. Bambitje community has recently benefitted from an EU funded sanitation programme implemented by World Vision. Every home has a clean toilet with additional waste pits in each. These new VIP toilets also include hand-washing facilities utilising 2 litre plastic bottles attached to the toilet. There has been education on sanitation and hygiene for all the families in the area although it is difficult to estimate who adheres to this.
Education and awareness raising	The Rural Health motivators stated that they try to teach people about purifying drinking water and believe that many are following their advice because the cases of diarrheal diseases in the community have declined over the years.
Waste management – Disposable nappies	A big challenge to waste management are disposable nappies which are said to litter the community. Although burning disposables and sanitary towels is an option many chose to throw in the veld or in the VIP latrines which are already full. This is a source of annoyance for those family members who have to dig new pits, in many instances the men. Recognising that water projects

Category	Issue raised
	always have a sanitation component; respondents were concerned that some families will not be able to improve their facilities.
Affordability	Respondents stated that many will make the connections even if they may be an initial reluctance to commit. An elderly couple stated that would even be willing to sell their cattle if necessary because they find it increasingly difficult to cope with fetching water and using an outdoor latrine. This is an important commitment considering the traditional attachment to cattle among Emaswati.

Recommendation from RHM indicated that the community would be grateful for more information on how to maintain their water connections, how to avoid faults and how to reduce costs.

8.1.2 Consultation with Traditional authorities

The importance of engaging with traditional authorities cannot be understated. Buy in from the traditional authority in general is key to the success of a project in the country. Table 8.5 summarises the issues raised during the engagements.

Table 8-5: Issues raised by Traditional Authorities

Category	Comment/Issue
Consultations	Respondents suggest that previous projects have been stalled or cancelled because the traditional authorities felt that they were not adequately consulted. Following the scoping activities that have been carried out by ESWC, Bandlancane expressed satisfaction with the consultations carried out so far in this project.
Reception of the project	The people of this area look forward to having water not only for drinking but also to plant vegetables. Some even have ambitions to plant sugar cane rather than maize. It is clear from informants that the implementation of a water project will give positive political mileage for all community leaders associated with it. Many are keen that the project be implemented during their term of office

Recommendations from Traditional authorities

i. Although all traditional authorities including Bandlancane expressed satisfaction with the scoping process carried out, further enhancement of this benefit would be for the Regional Administrator who is responsible for Chiefs within the region to be informed of the project and formally and to liaise with his chiefs for the duration of the project.

ii. Members of Libandla also expressed a hope that there would be further consultations as to where to construct Kiosks so that they are in easy reach of the neediest in the community.

Further Consultations will be carried out as outlined in the environmental and Social commitment plan (ESCP) and the Stakeholder Engagement Plan.

9. CAPACITY BUILDING, TRAINING AND TECHNICAL ASSISTANCE

9.1 Institutional Capacity for ESMP Implementation

The principal institution that will provide overall coordination including administration of the project is EWSC in order to ensure environmentally sound design and management of proposed project investments. However, other institutions will be directly or indirectly involved in the project.

9.1.1 *Eswatini Water Services Corporation*

The Eswatini Water Services Corporation, a parastatal organization under the MNRE, is responsible for the provision of potable and waste water services to scheduled designated areas which occur mostly in urban and peri-urban water supply and sanitation. EWSC has the technical capacity to oversee the implementation of the project. The EWSC will have overall responsibility for project implementation and coordination of activities. EWSC has established a project implementation unit (PIU), which includes a manager/coordinator and key specialists in the areas of engineering, environmental, social, procurement and financial management. In addition to these specialists, the PIU will also include sub-coordinators from DWA, EHD-MOH, and NDMA. The PIU will be responsible for preparation of consolidated workplan, procurement, financial, technical, environmental and social related documentation required for the project, as well as for the overall project monitoring and evaluation and preparation of progress and financial reports for the Project. A Project Operations Manual (POM) describing all processes, procedures, roles, and responsibilities related to project management and implementation will be prepared by the PIU within 3 months after project effectiveness.

The EWSC/PIU Environmental and Social team will require capacity building via awareness and training in the following areas namely: -

- World Bank ESSs
- Review of ESMP
- ESMP Implementation including monitoring and evaluation

9.1.2 *Environmental Health Department*

The Environmental Health Department (EHD) at Ministry of Health (MOH) will report periodically to the EWSC/PIU on all issues and aspects related to this project including environmental and social risks.

The EHD will require capacity building via awareness and training in the following areas namely: -

- World Bank ESSs
- Preparation of Project Brief for submission to EAA
- Proper siting of pit latrines
- Proper siting of septic tanks
- Cleaning and maintaining pit latrines
- Cleaning/removal of sludge from pit latrines and septic tanks
- Proper use of pit latrines
- ESMP implementation including monitoring and evaluation

9.1.3 *Local Communities/Beneficiaries*

The beneficiaries of the sanitation component will be the total population of the three target tinkhundla (Zombodze (14,231), Hosea (14,733) and Shiselweni I (9,269)) with a maximum reachable population of 38,233 people (2017), estimated to increase to 47,463 by 2047. Improved sanitation services will be provided to 4 health clinics and 32 schools in the three target tinkhundla reaching an estimated 2,000 people and 5,600 people, respectively. The Baby WASH interventions will target all households with children under 1000 days old living in the household (assuming approximately 8 percent of households11).

The beneficiaries will receive training and awareness as part of capacity building on among others: -

- Training on construction of pit latrines
- Proper siting of pit latrines
- Proper siting of septic tanks
- Proper use of pit latrines
- Cleaning and maintaining pit latrines (hygiene)
- Cleaning/removal of sludge from pit latrines and septic tanks
- Training on handwashing in schools, households and health facilities
- Communication for a change in hygiene behaviour;

9.1.4 *Contractors and supervision consultants*

Contractors and supervision consultants who will be procured to construct the septic tanks in schools and health facilities as part of best practice, and in order to comply with international standards for Occupational, Health and Safety (OHS), will be provided with awareness raising and environmental and OHS training on site. Training on Gender Based Violence (GBV), child labour and sexual harassment will also be provided to the contractors. A proposed format for 1 day training is provided in the following ***Table 9-1*** below.

Table 9-1. Awareness raising and training for civil work contractors and supervision consultants

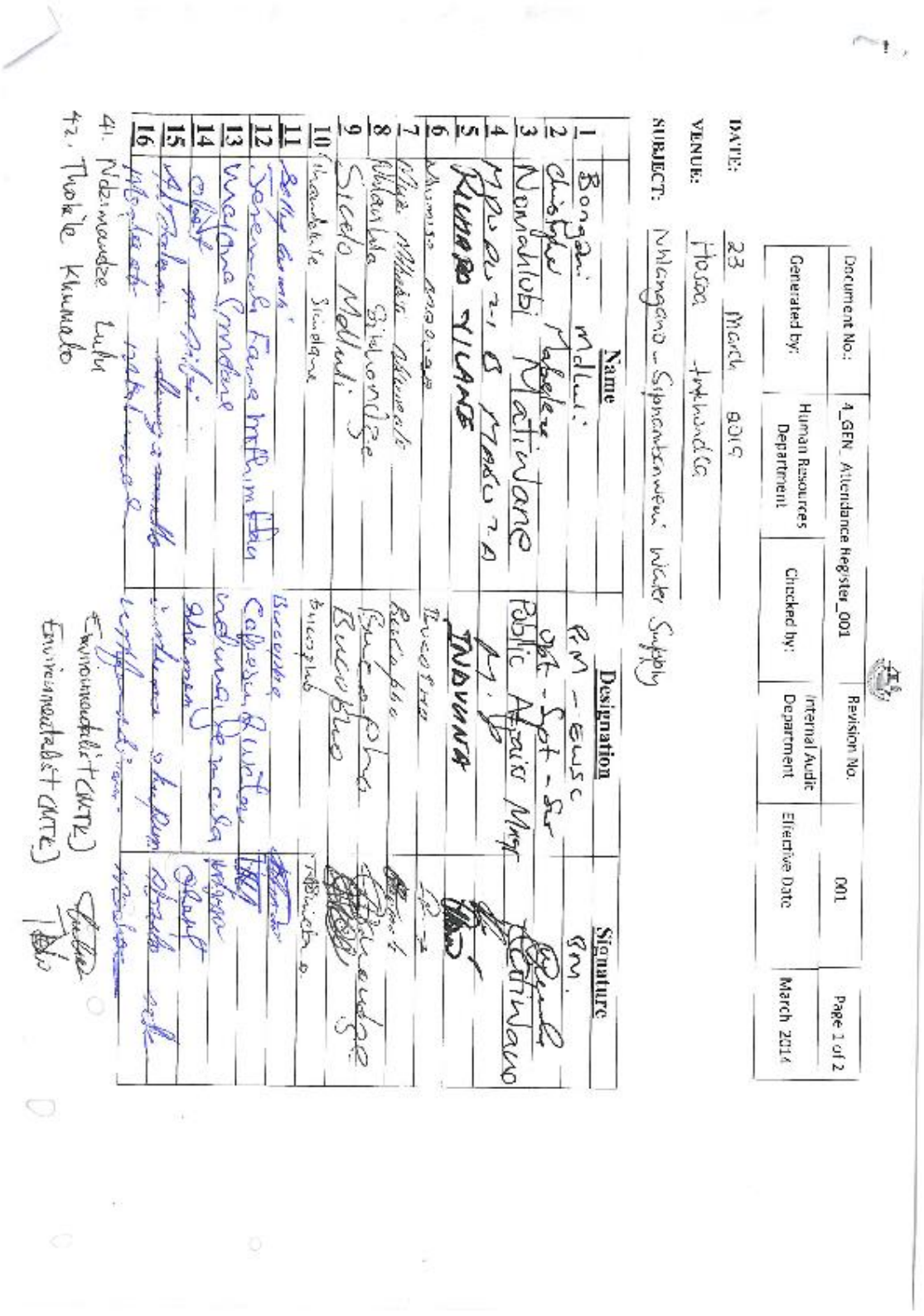
Topic	Input
Awareness raising • Environmental awareness and the importance of effective mitigation • Practice mitigation measures and environmentally sound construction techniques • Compliance with local legislation on OHS and ESMP requirements • Code of conduct • GBV and sexual harassment training	0.5 day
Technical training • Implementation of the ESMP (contract clauses) • Monitoring of ESMPs during construction	0.5 day
Total	**1 day**

[11] Based on Eswatini MICS survey results 2014

The estimated cost of capacity building and other support to implement the ESMP is given as US $, 500,000 which excludes the cost of preparing project site specific ESMPs in the event EAA requires so.

10. ANNEX

10.1 Annex A. Stakeholders Consulted- Attendance Register and Pictures



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DATE: 23 March 2014

VENUE: Hlobane Amphitheatre

SUBJECT: Nhlangano - Siphambanweni Water Supply

	Name	Designation	Signature
1	Bongani Mdluli	PM - EWSC	
2	Christopher Mabelele	Dist - Spat - Scr	
3	Nonhlanhla Mathendane	Public Affairs Mngr	
4	Mpumi Ntshangase	Acting	
5	Rumano Ylanga	Indvuna	
6	[illegible]	Business Dev	
7	Khaya Mbuso Dlamini	Recruitment	
8	Nhlanhla Sibiya	Business Dev	
9	Sicelo Mdluli	Business Dev	
10	[illegible]	Business Dev	
11	Betty Gama	Business Dev	
12	Sonwabile Faro Mthembu	Cadastre & Valuations	
13	Nwabisa Gwadiso	Industrial Relations Officer	
14	Cindy Mazibuko	Manager	
15	Mcebisi Mazibuko	Chairperson	
16	Nhlanhla Mazibuko	Councillor	

41. Ndzimandze Luthi (Environmentalist CWTE)

42. Thokozile Khumalo (Environmentalist CWTE)

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17	Sbeatle Mabuza	Health	
18	Ephraem Simelane	water chairperson	STH Simelane
19	Thomas Mkhwanazi Maduna	Pastor	M. Maduna
20	Mxolisi Andile	Youth	
21	Sibusiso Thwala	water chairperson	
22	Mfanomo Manqawe	VICE	M Manqawe
23	Th. Lani Mbeke Zeki Simelane	Youth	T
24	Alice Hlophe	Mgangqeteli	A Hlophe
25	Ncamsile Sibandze	Mgangqeteli	N. Sibandze
26	Thandi Dludlu	Shamemi'e	Dludlu
27	Mumsy Sithebe	Mgangeteli	M Sithebe
28	Rheki Simelane	Youth	
29	Bhekisile Shongwe	Mangangeteli	B. Shongwe
30	Nkengisile Dlamini	Nobhala wendlunkulu	Dlamini
31	Lindiwe Nkhambule	Nobhala wendlunkulu	L Nkhambule
32	Phaji Aron Dlamini	Vice chair water	Dlamini
33	Primrose M. Mdluli	Community Member	
34	WILSON MKHABELA	CHAIRMAN	Mkhabela CA
35.	THEMBEKILE DLAMINI	SIHLALO	Dlamini
36.	ENOCH Dlamini	INdoda yebandla	Dlamini
37.			
38.	Melusi MKHONTA	Youth	M.M
39.	MR. Vusi D. MASUKU	Secretary	
40.	MR. Nkululeko Mr. Lwazi Ayanda PHIRI	Extension OFFICER EWSC	

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ATTENDANCE REGISTER

DATE: 30 March 2019

VENUE: Shiselweni 1 Inkhundla

SUBJECT: Nhlangano - Siphambanweni Water Supply

	Name	Designation	Signature
1	Sifiso Khumalo	Liaison Veinkhundla	
2	Lulu Ndzimandze	Environmentalist (MTK)	
3	Sindisiwe Nkwanalo	Sociologist (MTK)	
4	Jabulani Thwala	Field officer (MTK)	
5	PHILA NDZINISA	Inkhundla Secretary	
6	Bawinile Ngwenya	Bucopho	
7	NHLANHLA Matsenjwa	Bucopho	
8	Celimpilo Khumalo	Bucopho	
9	Jikile Ntshangase	Member of Water Committee	
10	Jeremy Glass	Mphakatsi Member	
11	Vusi Sithole	Mphakatsi	
12	Lindiwe Hlophe	Pastor	
13	Sithole Bafanafadwa	Bucopho	
14			

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15	NONHLANHLA NXUMALO	DASFOR	N.Nxumalo
16	REJOICE MKHWANAZI	INKHUNDLA TYPIST	R.Mkhwanazi
17	Winile Mthethwa	Bucopho	
18	Rose Shelane	Lomele Tinhlangano	
19	Khangisile Nkwanyana	Mgcugcuteli	K.Nkwanyana
20	Nadine Khumalo	Banakekeli	
21	Precious Zwane	Mgcugcuteli	PZ.
22	Zanele Mpanza	Lomele Tinhlangano	Mpanza
23	Evan v. Nxumalo	" Umphakatsi	E.Nxumalo
24	Bhekizizwe J. Dlamini	(Indvuna) Mchunguni	
25	Sizwe S. Mkhonta	Mchunguni (Luthungu)	S.S. H
26	Sizwe Sithole	Sigodi	
27	MALUNGELO T. DLAMINI	YOUTH CHAIRMAN	
28	DANIEL NSIBANDE	SEKOLA	D.N.
29	Phineas B. Ndlangamandla	Bandlaneane	P.Ndlangamandla
30	MHLANGANISI - NDLANGAMANDLA	Betwil Water Project	
31	MTSHAKALANGA DLAMINI	Zakahlahle water project	
32	Mr	Induna	
33	MOSES MHLANGASE	PHASELA	
34	Sphiwe Ndlangamandla	Mgcugcuteli	S.Ndlangamandla
35	Jetro Gcaleka	Bandlaneane	J.G

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ATTENDANCE REGISTER

DATE: **30th March 2019**

VENUE: **Shiselweni 1 Inkhundla**

SUBJECT: **Nhlangano-Siphambanweni Proposed Water Supply Project** **Facilitator:**

	Name	Designation	Signature
1	Daniele Matsenjwa	Youth	
2	Makhosazana Zwane	Community	
3	Busi Ndlangamandla	R H M	B. Ndlangamandla
4	Mr. Melson Dlamini	Chairperson Project	
5	Alton Shongwe	Association	Alton
6	Alson Vilakazi	Umphakatsi	
7	Zandile Nxumalo	Bacingcweli	
8	Sphesihle Mayisela	Youth	S.M
9	Beatrice Vilakazi	Umphakatsi	B. Vilakazi
10	Elizabeth Dube	R. H. M.	E. Dube
11	Zanele Zwane	R. H. M	Z. Zwane
12	Nkosingiphile Ndwandwe	R. H. M	
13	Simiso Dlamini	Bucopho	
14			

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15	Nokuthula Mgwenya	Youth	N.M.
16	Thandi Mthembu		
17	Nomfundo Hlophe	Youth	N. Hlophe
18	Sumsani MABUZA	Bucopho	S. Mabuza
19	ABNER NKWANYANA	Bakakhaleni Water Project Chairperson	Nkwanyana
20	D MTHETHWA	SAKABILE WATER PP	
21	NCENGI NDLANGAMANDLA	VICE CHAIRLADY (WATER)	N. Ndlangamandla
22	Thabsile Dlwelu	Youth	TDlwelu
23	Bongani Mdluli	EWSC	Bm.
24	Nomahlubi Matiwane	EWSC	
25	Thobile Simelane	EWSC	TS
26			
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ATTENDANCE REGISTER

DATE: 16 March 2019

VENUE: Zombodze - Emuva Inkhundla

SUBJECT: Nhlangano - Siphambanweni Wata Project

	Name	Designation	Signature
1	Nomahlubi Matiwane	Public Affairs Manager	Matiwane
2	Thobile Simelane	Regional Manager - EWSC	
3	Ntuli Ayanda	Communications Officer	
4	Bongani Mdluli	EWSC - Project Manager	BM.
5	Mandla Lucky Mudzebele	Bucoplho	
6	Vusie Mabuza	Bucoplho	
7	Sinanga Mdluli	Bucoplho	
8	NOMCEBO MCHWANAZI	REGIONAL OFFICER	
9	LUMENE MUZA	N.P	
10	NSweneyo Bheki	INGwavuma	
11	Lindiwe Kunene	INKHUNDLA SECRETARY	
12	WENZILE DLAMINI	EWSC - OPERATIONS SUPERVISOR	
13	Nomathemba Mthethwa	Member	
14	Thomas Hlanini	Youth	

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15	NTembenhle Nkonyane	Umgcugcuteli	N.Nkonyane.
16	BONGILE NKONYANE	LILUNGA LALABASHA	S.NKONYANE
17	Khetsiwe Ntshangase	Wash Committee	K. Ntshangase
18	Ayanda Mahlambi	Umgcugcuteli	Mahlambi
19	Sibongile Gama	R.L.M	S.Gama
20	Thembsile Vilane	Libhoyisa lemango	T.Vilane
21	Mseki MKWELI	ng.sekomidini	M.M
22	Josefa Vilakati	Phayisalemang	J. J
23	Bongiwe Motsa	labasha	Bm
24	Sabelo Dlamini	Bandlancane	
25	SIPHO NKONYANE	CHAIR P. WATER & SANITA	
26	HEZEKIA DLAMINI	UMDHLALATHI	
27	Jabulani MTHUNZI	umphakathi	Bulenkeni
28	Lukha nyaba	umPhakathi	ebulenkeni
29	ITERIC MAMBA	ZOMBODZE (MAHLABATSINI)	Mamba
30	THAMSANQA S. NHLWATI	zombodze MHlahlandlela	
31	TITUS MOISA	zombode Ngwenyameni	X
32	JOHN NKUMANE	Ngwenyameni R.H.M	J Nkumane
33	Ephraem Ngwenya	Mampondweni/Umphakatsi	X
34	Jabulani Mkhonta	Zombodze Umphakatsi	Jmkhonta
35	Vusimuzi Mamba	Mampondweni	

10.2 Annex B. Legal Framework

The Constitution of the Kingdom of Eswatini Act

The Constitution of the Kingdom of Eswatini Act, 2005 (Act No: 001 of 2005) in section 210 declares all land, minerals and water as national resources. The section also obliges the State to in the interest of the present and future generations, to protect and make rational use of its land, mineral and water resources as well as its fauna and flora, and shall take appropriate measures to conserve and improve the environment. In terms of section 216(1) every person has the responsibility to promote the protection of the environment and section 216(3) obliges the State to ensure a holistic and comprehensive approach to environmental preservation and shall put in place an appropriate environmental regulatory framework.

Chapter 13 of the new constitution requires the establishment within five years of a single countrywide system of local government, to allow people at sub-national and local level to progressively take control of their own affairs. Local governments shall be organized and administered through democratic means. The introduction of the new constitution coincides with the government's decentralization policy and implementation strategy. The new constitution specifically articulates its position on property and compensation in Section 19 (1) states that "a person has the right to own property alone or in association with others." Furthermore, the in 19(2b) the constitution states that no one should be deprived of property ownership and in cases of public interest or safety owners shall be duly compensated.

10.3 The Environmental Management Act No 5 of 2002

The stated purpose of the Environment Management Act, 5 of 2002 (s4) is to provide for and promote the enhancement, protection and conservation of the environment and where appropriate, the sustainable management of natural resources.

The Act goes further and establishes guiding environmental principles in section 5 and in section 6(1) obliges any person or body exercising powers or functions or making decisions under this Act shall give effect to the purpose of this Act and the principles. Section 6(2) obliges any Cabinet Minister, Government Officer or other person exercising a public function that is likely to affect the protection, conservation or enhancement of the environment or the sustainable management of natural resources to in the course of exercising that public function apply and provide for these principles in exercising that public function. In section 9 the Eswatini Environment Authority is established and its functions is listed in section 12(2) and includes amongst others –

- to administer licences issued under the Act in accordance with the provisions of the Act;
- to review environmental impact assessment reports and strategic environmental assessments reports;
- to facilitate public involvement in decision making concerning the environment including establishing procedures to facilitate the submission of comments on licence applications under this Act; Section 32(1) states that no person shall undertake any project that may have an effect on the environment without the written approval of the Authority, or in the case of a review, of the Minister, and except in accordance with any conditions imposed in that approval.

The various subsections of section 32 establish the process that needs to be followed in obtaining approval to undertake a project which may have an impact on the environment. The section also prescribes the content of the various reports required and the process that needs to be followed by the SEA in advising the Minister on such an application.

Section 33 provides for the Minister responsible for environmental affairs to make regulations for the better administration of amongst others environmental impact assessments and may prescribe inter alia –

- Categories of projects that may have an impact on the environment;
- Procedural requirements for public hearings;
- Information be included in environmental impact assessment reports and comprehensive mitigation plans;
- Administration fees for applications.

The Principles of the Environmental Management Act

In achieving the purpose of this Act, the following principles shall be applied:

- The environment is the common heritage of present and future generations;
- Adverse effects should be prevented and minimised through long term integrated planning and the coordination, integration and co-operation of efforts, which consider the entire environment as a whole entity;
- The precautionary principle, which requires that where there is a risk of serious or irreversible adverse effects occurring, a lack of scientific certainty should not prevent or impair the taking of precautionary measures to protect the environment;
- The polluter pays principle, which requires that those causing adverse effects shall be required to pay the full social and environmental costs of avoiding, mitigating, and/or remedying those adverse effects;
- The generation of waste should be minimised wherever practicable;
- Waste should, in order of priority, be re-used, recycled, recovered and disposed of safely in a manner that avoids creating adverse effects or if this is not practicable, is least likely to cause adverse effects;
- Non-renewable natural resources should only be used prudently, taking into account the consequences for the present and future generations; and
- Renewable resources and ecosystems should only be used in a manner that is sustainable and does not prejudice their viability and integrity.

The Environmental Audit, Assessment and Review Regulations, 2000.

These regulations issued under the Eswatini Environmental Authority Act, 1992 and Environmental Management Act, 2002; underline processes that must be taken for any proposed project in order to predict and evaluate likely environmental impacts under studies such as the ESIA. An Environmental Compliance Certificate (ECC) is issued by the SEA when all the necessary environmental documentation has been submitted and approved by the authority for a proposed project.

The assumption underlying the issuance of an ECC is that the proposed project is not likely to cause unacceptable environmental impacts and that the proponent will manage the construction and operation of the project in accordance with an approved comprehensive mitigation plan. In Eswatini, the term ‘project’ is defined as: “a plan,

operation, undertaking, construction, development, change in land use or other entity, or alteration which may not be implemented without a permit, licence, consent or approval from an authorising agency."

There are several other important permits and licences required in terms of other environmental legislation in Eswatini relating to environmental issues.

Other applicable legislation

The Flora Protection Act of 1958

This Act promotes the conservation and protection of certain plants, through the use of a Schedule, trees, shrubs and vegetation and any living or dead portion of plants from destruction. If any protected flora exists in the project area and is likely to be cut or uprooted, this requires a permit from the Ministry of Agriculture and Co-operatives (MOAC). Very few protected plants or trees will be affected by the project, and every measure should be undertaken to protect these plants if possible.

The Public Health Act of 1969

Eswatini Public Health concerns, and ways of dealing with them, have been expressed in the principal legislation: the Public Health Act 5 of 1969. The Act defines the Authority for prescribing and enforcing preventative and remedial measures for the protection of public health in Eswatini. However, in recent years there has been increasing concern expressed by the environmental health officials, health officers and others that the Act fails to provide the back-up required to control risks to public health, and that it fails to meet the present-day environmental health needs. The Act is relevant in view of the fact that the project activities may lead to public health risks during construction and operation of the sanitation facilities.

Human Settlements Authority Act of 1988

The act established the Human Settlements Authority and its objects and functions. It provides policy support to Government and the orderly development of human settlements by allowing for and outlining procedures for the establishment of Human Settlements. It also makes provision for the development of human settlement development plans, the revocation or modification of development plans and finance mechanisms for the supply and maintenance of improved shelter and infrastructure.

Urban Government Act of 1969

This Act provides the basis for the establishment of local authorities in Eswatini as a primary legal instrument defining the parameters under which city councils conduct their affairs. The act outlines the duties and powers of Councils; makes provision for meetings of Councils and Committees, Management Committees and staff; designates towns, land, streets and public places; and the administration and audit of Council accounts.

Factories, Machinery and Construction Works Act of 1972

The act deals with the regulation of working conditions and the use of machinery at factories and construction sites. Section 19 requires the reporting of accidents in the workplace and therefore any accident during the project is to be formally reported. Section 20 requires that safety devices not be interfered with, that employees shall use safety equipment provided and that no persons shall do anything that places their own safety and that of others at risk.

Workmen's Compensation Act of 1983
The Act provides for the compensation and medical treatment of workmen who suffer injury or contract work-related diseases in the course of their employment. Relevant to this project is section 25 which requires the employer to be insured against liability for work-related injuries.

Occupational Safety and Health Act of 200
The Occupational Safety and Health Act provides for the safety and health of persons at work and at the workplace, and for the protection of persons other than those at the workplace against hazards to safety and health arising from work activities. Relevant aspects of this act are section 9 which stipulates the duties of the employer to ensure safe and healthy working conditions, make employees aware of the hazards of the workplace, provide personal protective equipment, provide training and supervision of employees, prevent exposure of non-employees to hazards arising from the works; section 11 which stipulates the duties of the employee to cooperate and follow the instructions of the employer, use equipment and safety devices provided by the employer, report accidents and unsafe conditions to the employer; section 28 which requires the employer to record and report minor and major accidents and dangerous occurrences to the Labour Inspector.

Regulations
Building Operations Regulations of 1969
The regulations control building activities and the safety of buildings. Regulation 54 requires a person carrying out building work to minimize any public nuisance such as noise, dust and unsightliness caused by the work. This is relevant to the project in terms of potential noise and dust.

Environmental Audit, Assessment and Review Regulations of 2000
Under the SEA the Environmental Audit, Assessment and Review Regulations, 2000 have been issued which regulate the EIA process and place requirements on reporting techniques. Three categories of project are assigned by the Authority, having due regard to environmental sensitivity. Category 1 is the least impactive and requires little study. Category 3 projects are deemed to have "significant adverse impacts whose scale extent and significance cannot be determined without in-depth study". The project under review has been assigned a Category 2 in accordance with these regulations. The depth of study and reporting format are in accordance with the regulations.

Factories, Machinery and Construction Works Regulations of 1974
The regulations control health and safety working conditions and the use of machinery at factories and construction works. Regulation 9 requires that machinery be kept in good and safe working condition and used safely which is relevant to construction vehicles and other equipment; Regulation15 requires the training and supervision of inexperienced personnel using machinery which is relevant to the machine operators; Regulation 151 requires that hearing protection be provided and used in noise zones which is relevant for operators of noisy machinery (above 85 decibels); Regulation 152 requires that no person under the influence of alcohol be permitted into the workplace.

Standard Building Regulations of 1969

These regulations provide for the control of building activities and the safety of buildings. Relevant to this project is Regulation 70 which stipulates that no lavatory or pit latrine shall be constructed within 30.5 m of any water source.

Eswatini Building (Grade II) Regulations of 1966
These regulations provide for the control of building activities and the safety of buildings. Of relevance to this project is Regulation 11 which stipulates that no person shall dump or dispose of any debris or rubbish except at such places and in such a manner as may be appointed by the local authority.

Waste Regulations of 2000
The Waste Regulations control the collection, transport, sorting, recovery, treatment, storage and disposal of waste collection and disposal of waste. Waste generation is anticipated during this project and hence the relevance of these Regulations.

Water Pollution Control Regulations of 2010
The regulations control the discharge of effluents exceeding acceptable effluent standards for the preservation of water quality. If any person intentionally or negligently discharges potentially polluting substances into a water body above acceptable standards, that person will be guilty of an offence. Activities during establishment and operation that may cause pollution will be subjected to these regulations. This is particularly pertinent given the potential disposal of waterborne wastes.

Workmen's Compensation Regulations of 1983
These Regulations control the reporting of workplace accidents and work-related diseases, the provision and payment of medical treatment of injured employees and the compensation of such employees.

Gender equity
Since 2000, a series of significant legislation relating to gender equity in Eswatini has come into being including the new constitution. The situation may be summarized as follows:

- Under the UDP a 99-Year Lease was introduced which provided equal access to land regardless of gender;
- The Constitution of the Kingdom of Eswatini (2005), as well as protecting fundamental rights of all citizens (Section 14), specifically enshrines the rights of women (Section 28) to equal treatment, political, economic and social opportunities and commits the Government to enhancing their welfare, and provides for equal access to land irrespective of gender (Section 211). Furthermore, according to Section 28 (3) women may not be compelled to undergo or uphold any custom "to which she is in conscience opposed.
- The Gender Unit in the Ministry of Home Affairs has identified Constitutionalism and Law Reform as a priority and they have drafted a Program of Action with the assistance of UNDP. Currently the Constitution has two provisions explicitly stating the protection from gender discrimination and inequality before the law based on gender. Sections 14 and 28 enshrine gender equality reforms and redress previous legislation such as the Marriage Act of 1964, the Deeds Registry Act of 1938 and the Intestate Succession Act of 1953 and other inheritance laws.

World Bank Environmental and Social Standards

The Nhlangano-Siphambanweni Water Supply and Sanitation Project (NSWSP) to be supported by the Bank through Investment Project Financing are required to meet the following Environmental and Social Standards and objectives and their applicability is shown in Table below:

Table 10-1: WB ESSs Objectives and Applicability

Standards	Objective s	Applicability
ESS1 Assessment and Management of Environmental and Social Risks and Impacts	To identify, evaluate and manage the environment and social risks and impacts of the project in a manner consistent with the ESSs. To adopt a mitigation hierarchy approach to: (a) Anticipate and avoid risks and impacts; (b) Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels; (c) Once risks and impacts have been minimized or reduced, mitigate; and (d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible . To adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities resulting from the project. To utilize national environmental and social institutions, systems, laws, regulations and procedures in the assessment, development and implementation of projects, whenever appropriate and also promote improved environmental and social performance, in ways which recognize and enhance Borrower capacity.	ESS1 applies to all projects supported by the Bank through Investment Project Financing and is therefore applicable in this project.

Standards	Objective s	Applicability
ESS2 Labor and Working Conditions	To promote safety and health at work. To promote the fair treatment, non-discrimination and equal opportunity of project workers. To protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers, community workers and primary supply workers, as appropriate. To prevent the use of all forms of forced labor and child labor. To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law. To provide project workers with accessible means to raise workplace concerns.	Its applicability depends on the type of employment relationship between the Borrower and the project worker and it is established during the environmental and social assessment described in ESS1.For the implementation of this project, labour (ranging from unskilled to skilled) will be required.
ESS3 Resource Efficiency and Pollution Prevention and Management	To promote the sustainable use of resources, including energy, water and raw materials. To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. To avoid or minimize project-related emissions of short and long-lived climate pollutants. To avoid or minimize generation of hazardous and non-hazardous waste. To minimize and manage the risks and impacts associated with pesticide use.	The applicability of this ESS is established during the environmental and social assessment described in ESS1. EWSC will be required to consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention.
ESS4 Community Health and Safety	To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstances. To promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure, including dams. • To avoid or minimize community exposure to project-related traffic and road	The applicability of this ESS is established during the environmental and social assessment described in ESS1. This ESS addresses potential risks and impacts on communities that may be affected by project activities. Occupational health and safety (OHS) requirements for project workers are set out in ESS2, and measures to avoid or minimize impacts

Standards	Objective s	Applicability
	safety risks, diseases and hazardous materials. To have in place effective measures to address emergency events. To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.	on human health and the environment due to existing or potential pollution are set out in ESS3.
ESS5 : Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	To avoid involuntary resettlement or, when unavoidable, minimize involuntary resettlement by exploring project design alternatives. To avoid forced eviction. To mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use by: (a) providing timely compensation for loss of assets at replacement cost and (b) assisting displaced persons in their efforts to improve, or at least restore, their livelihoods and living standards, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. To improve living conditions of poor or vulnerable persons who are physically displaced, through provision of adequate housing, access to services and facilities, and security of tenure. To conceive and execute resettlement activities as sustainable development programs, providing sufficient investment resources to enable displaced persons to benefit directly from the project, as the nature of the project may warrant. To ensure that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation, and the informed participation of those affected.	This ESS applies to permanent or temporary physical and economic displacement resulting from the following types of land acquisition or restrictions on land use undertaken or imposed in connection with project implementation: (a) Land rights or land use rights acquired or restricted through expropriation or other compulsory procedures in accordance with national law; (b) Land rights or land use rights acquired or restricted through negotiated settlements with property owners or those with legal rights to the land, if failure to reach settlement would have resulted in expropriation or other compulsory procedures; (c) Restrictions on land use and access to natural resources that cause a community or groups within a community to lose access to resource usage where they have traditional or customary tenure, or recognizable usage rights . This may include situations where legally designated protected areas, forests, biodiversity areas or buffer zones are established in connection with the project; (d) Relocation of people without formal, traditional, or recognizable usage rights, who are occupying or utilizing land prior to a project specific cut-off date; (e) Displacement of people as a result of project impacts

Standards	Objective s	Applicability
		that render their land unusable or inaccessible; (f) Restriction on access to land or use of other resources including communal property and natural resources such as marine and aquatic resources, timber and non-timber forest products, fresh water, medicinal plants, hunting and gathering grounds and grazing and cropping areas; (g) Land rights or claims to land or resources relinquished by individuals or communities without full payment of compensation; and (h) Land acquisition or land use restrictions occurring prior to the project, but which were undertaken or initiated in anticipation of, or in preparation for, the project. This ESS does not apply to impacts on incomes or livelihoods that are not a direct result of land acquisition or land use restrictions imposed by the project. Such impacts will be addressed in accordance with ESS1. 6. This ESS does not apply to voluntary, legally recorded market transactions in which the seller is given a genuine opportunity to retain the land and to refuse to sell it, and is fully informed about available choices and their implications. However, where such voluntary land transactions may result in the displacement of persons, other than the seller, who occupy, use or claim rights to the land in question, this ESS will apply.
ESS6 Biodiversity Conservation and	This standard aims to protect and conserve biodiversity, the variety of life in all its forms, including genera, species and	This policy is triggered by any project (including any sub-project under a sector investment or financial

Standards	Objective s	Applicability
Sustainable Management of Living Natural Resources	ecosystem diversity and its ability to change and evolve; which is fundamental to sustainable development.	intermediary) with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project).
ESS7 Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	It recognises the possibility of vulnerability of indigenous people owing to their culture, beliefs, institutions and living standards and that it may further get compromised by one or other project activity throughout the life cycle of the project. This standard underlines the requirement of minimizing adverse impacts on indigenous people in the project area, respecting the local culture and customs, fostering good relationship and ensuring that development benefits are provided to improve their standard of living and livelihoods.	The policy is triggered when the project affects the indigenous people in the project area.
ESS8 Cultural Heritage	It aims to protect the irreplaceable cultural heritage and to guide project proponents on protecting cultural heritage in the course of project operations.	This standard is triggered when a project finds items of cultural significance.
ESS9 Financial Intermediaries (FIs	The standard identifies that strong domestic capital and financial markets and access to finance are important for economic development, growth and poverty reduction. FIs are required to monitor and manage the environmental and social risks and impacts of their portfolio and FIs subprojects. They also develop and maintain, in the form of an Environmental and Social Management System (ESMS), effective environmental and social systems, procedures and capacity for assessing, managing, and	Applicable when there are Ifs in the project area.

Standards	Objective s	Applicability
	monitoring risks and impacts of subprojects, as well as managing overall portfolio risk in a responsible manner.	
ESS10 Stakeholder Engagement and Information Disclosure	This ESS recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.	
World Bank Group Environmental, Health and Safety Guidelines	The General EHS Guidelines contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors. The guidelines include;- Environmental ▪ Air Emissions and Ambient Air Quality ▪ Energy Conservation ▪ Wastewater and Ambient Water Quality ▪ Water Conservation ▪ Hazardous Materials Management ▪ Waste Management ▪ Noise ▪ Contaminated Land Occupational Health and Safety ▪ General Facility Design and Operation ▪ Communication and Training ▪ Physical Hazards	These guidelines will be followed during the preparation of mitigation measures. When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. These EHS Guidelines give specific guidance on prevention and control of community health and safety impacts that may occur during new project development, at the end of the project life-cycle, or due to expansion or modification of existing project facilities. Cross referencing is made to various other sections of the General EHS

Standards	Objective s	Applicability
	▪ Chemical Hazards ▪ Biological Hazards ▪ Radiological Hazards ▪ Personal Protective Equipment (PPE) ▪ Special Hazard Environments ▪ Monitoring Community Health and Safety ▪ Water Quality and Availability ▪ Structural Safety of project Infrastructure ▪ Life and Fire Safety (L&FS) ▪ Transport of Hazardous Material ▪ Disease Prevention ▪ Emergency Preparedness and Response Construction and Decommissioning ▪ Environment ▪ Occupational Health and Safety ▪ Community Health and Safety	Guidelines. Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. Preventative, measures will be introduced to ensure OHS. They also provide guidance in the preceding environmental and occupational health and safety sections, specifically addressing some aspects of project activities taking place outside of the traditional project boundaries, but nonetheless related to the project operations, as may be applicable on a project basis. These issues may arise at any stage of a project life cycle and can have an impact beyond the life of the project. Construction activities may result in a significant increase in movement of heavy vehicles for the transport of construction materials and equipment increasing the risk of traffic-related accidents and injuries to workers and local communities. The incidence of road accidents involving project vehicles during construction should be minimized.
WBG EHS Guidelines for Sanitation	Impoundment should prevent adverse impacts to the quality and availability of groundwater and surface water resources	Where the project includes the delivery of water to the community or to users of facility infrastructure (such as hotel hosts and hospital patients), where water may be used for drinking, cooking, washing, and bathing, water quality should comply with national acceptability standards or in their absence the current edition of with WHO Drinking Water

Standards	Objective s	Applicability
		Guidelines. Groundwater and surface water represent essential sources of drinking and irrigation water in developing countries, particularly in rural areas where piped water supply may be limited or unavailable and where available resources are collected by the consumer with little or no treatment. Project activities involving wastewater discharges, water extraction, diversion or impoundment should prevent adverse impacts to the quality and availability of groundwater and surface water resources. . Drinking water sources, whether public or private, should at all times be protected so that they meet or exceed applicable national acceptability standards or in their absence the current edition of WHO Guidelines for Drinking-Water Quality. Air emissions, wastewater effluents, oil and hazardous materials, and wastes should be managed according to the guidance provided in the respective sections of the General EHS Guidelines with the objective of protecting soil and water resources. Project activities should not compromise the availability of water for personal hygiene needs and should take account of potential future increases in demand. The potential effect of groundwater or surface water abstraction for project activities should be properly assessed through a combination of field testing and modeling techniques, accounting for seasonal variability and projected changes in demand in the project area.

10.4 Annex C. Guidelines for Construction of Pit Latrines

INTRODUCTION

Purpose of Guide

The purpose of this guide on pit latrines is to provide technical knowledge on the importance of and how to build a pit latrine, including:

SITING, MEASURING PIT, DIGGING PIT, SLAB CONSTRUCTION and the construction of the SHELTER or SUPERSTRUCTURE of the pit latrine.

This guide is meant for Extension Workers in Swaziland. It will serve as a guide for them in helping communities they serve to build pit latrines.

For further information and/or assistance on pit latrine construction, contact Health Personnel in your area.

The Purpose of a Pit Latrine

It has been discovered through research that many of the most important diseases of mankind, especially diarrhoeal diseases, are excreta-borne. Germs causing these diseases, diseases such as: cholera, typhoid fever,

1

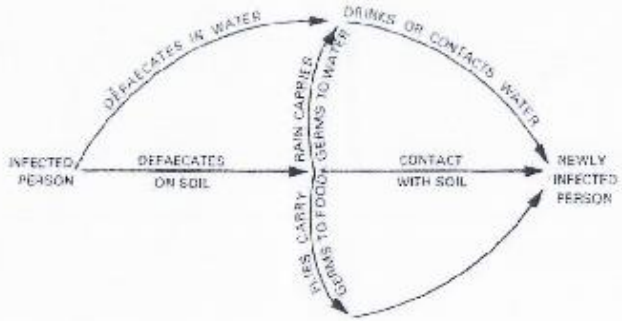
paratyphoid fever, dysentery, hookworm disease, and roundworms are harboured in excreta of persons suffering from or acting as carriers of these diseases. Transmission of these diseases occurs when germs find their way into water, soil and food, and, in the case of hookworm, to soil.

When food, soil, or water so contaminated is ingested by humans, they contract these diseases. Bilharzia is contracted when a person comes into contact with water contaminated with excreta that harbours snails infected with the bilharzia parasites. Hookworm disease is contracted through contact with SOIL contaminated with excreta that harbours hookworms.

It is therefore very important to PREVENT or STOP excreta from entering FOOD and WATER that is meant for human consumption or from contaminating the SOIL - otherwise these diseases may SPREAD to very high levels such that it would be VERY DIFFICULT TO CONTROL THEM. The best method to do this is to ISOLATE faeces so that the infectious agents or germs in them cannot possibly get to a NEW HOST or another person. This can be done by PROPER DISPOSAL OF EXCRETA or FAECES. Indiscriminate

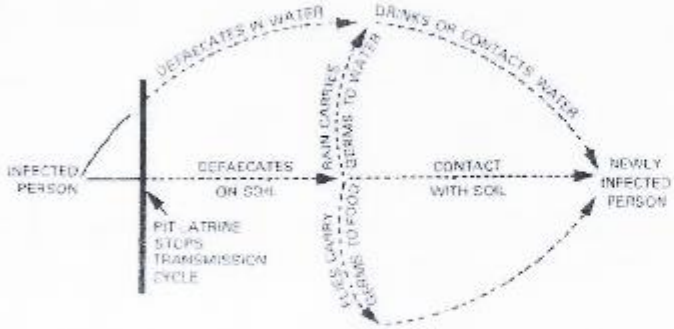
2

DEFAECATION should come to an end, everybody should have ACCESS to and USE a LATRINE.



3

In rural areas, the use of a pit latrine may be a very important way to break the cycle of FAECAL-BORNE diseases.



What is a Pit Latrine?

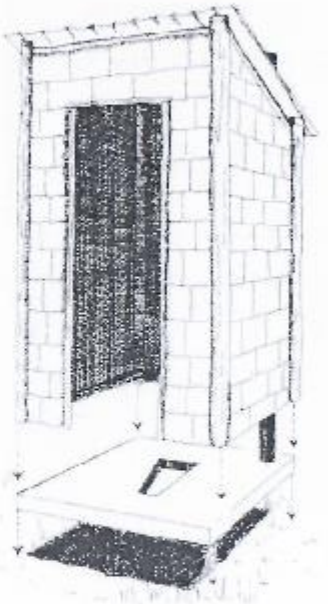
A pit latrine is a place where people can urinate and defaecate in privacy and which provides protection of the environment from contamination.

A pit latrine consists of:

(i) A PIT; i.e. a dug hole in the ground;

(ii) A SLAB with VENT PIPE; i.e. floor of latrine and vent pipe;

(iii) A SHELTER: to provide protection for the user.



The Pit

The pit isolates faeces from the environment and prevents contamination of the soil and water. In this way, it prevents the spread of disease by keeping germs in excreta away from humans, animals and insects.

A pit is a hole dug into the ground. It has dimensions: length, width and depth. At the top, the pit may have a BASE to support the SLAB. A pit may also have a LINING, in cases where the soil is loose and tends to cave in. If the pit walls will NOT stand on their own, a LINING prevents them from caving in. The LINING is installed after the pit is dug.

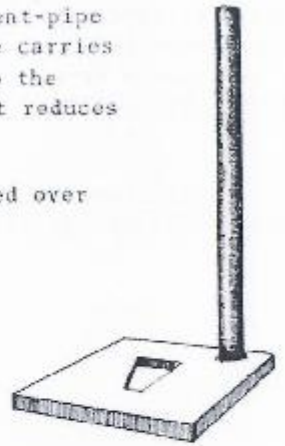
A properly constructed pit will last about 10 years.

The Slab

The slab is the floor of the pit latrine or privy. The slab covers the pit. It has a hole through which to defaecate and another hole, a vent-hole.

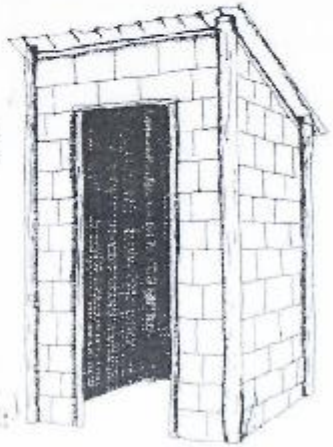
The vent-hole is where a vent-pipe is inserted. The vent-pipe carries away odours from the pit to the atmosphere. In this way it reduces the odours.

A seat may also be installed over the defaecation hole.



The Privy Shelter

The privy shelter is a screen or structure that gives the person using a privy privacy. It may also protect the USER from the weather.



THE PIT

Siting a Pit Latrine

(1) For convenience, the privy should not be far from a homestead. It should not be more than 30m away;

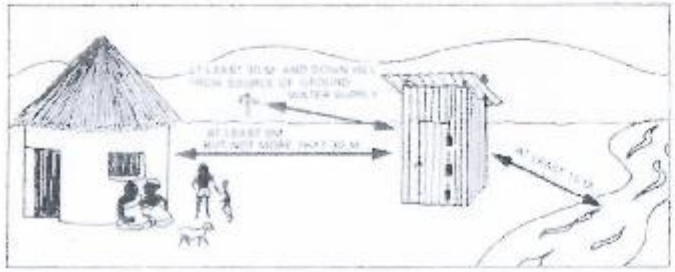
(2) It should not be too close to the homestead. It should not be less than 6m away;

(3) It should not be sited less than 15m away from any river, stream or lake;

(4) It should be located downhill from any source of ground water supply and at least 30m away from such supply;

(5) If downhill siting is not practicable then locate pit privy NOT directly above source of groundwater supply. Put it either on the left or right of it.

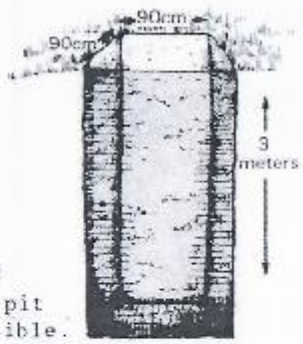
(6) It should be located downhill of the homestead.



Pit Dimensions

Recommended dimensions of the pit are:

Length - 90cm
Width - 90cm
Depth - 3m



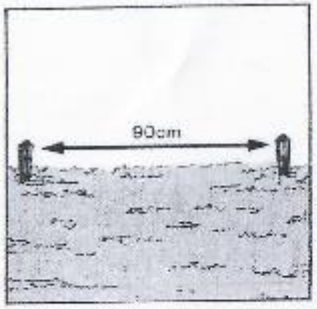
These dimensions will suit well the kind of slab described in this guide.

In cases where the ground formation does not allow digging to 3m, the pit should be as deep as possible.

Measuring the Pit

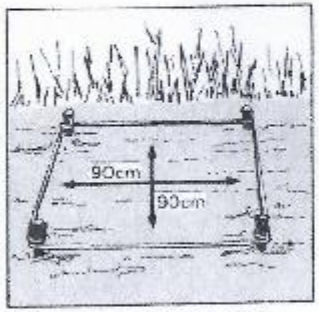
(1) Clear the site of any tall vegetation.

(2) Knock or hammer down a peg into the ground



(3) From the peg measure 90cm and put a marker. Knock down another peg where the marker is.

(4) By means of a builder's square, make a 90° bend or corner from each peg and measure 90cm.



(5) Put a marker and knock down a peg at each point thus located to form the four corners of a square. Join all four pegs by means of a rope, fish-line or string such that the 90cm x 90cm dimensions of the would-be pit are retained.

(6) Now, dig within the pegs and strings straight down to a depth of 3m. (The resultant pit should be 90cm x 90cm).

SLAB CONSTRUCTION

Slabs can be of two kinds:

(1) A concrete slab;

(2) Slab that can be made from local material.

Slab Dimensions:

Length - 1m (100cm)
Width - 1m (100cm)
Thickness - 0.1m (10cm)
(at least 5cm thick)

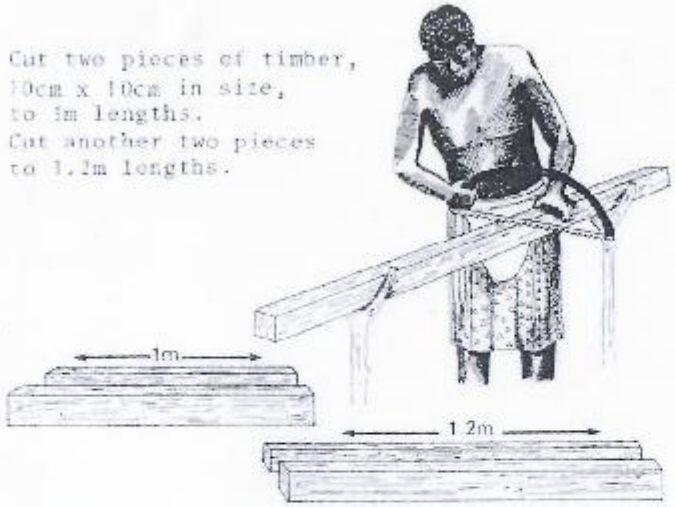
These dimensions can be used for both kinds of slabs.

A. Preparation of Ground for Moulding Slab

Prepare the ground on which the slab will be cast, and make sure the ground is level. Pour a thin layer (one wheelbarrow full) of riversand over prepared ground and smooth out.

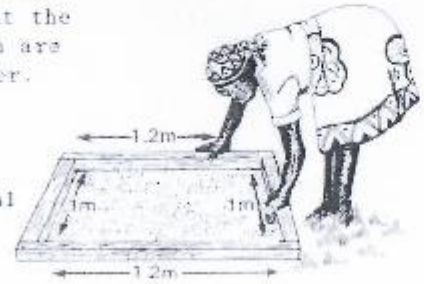
8. Making Slab-Form or Frame

Cut two pieces of timber, 10cm x 10cm in size, to 1m lengths.
Cut another two pieces to 1.2m lengths.

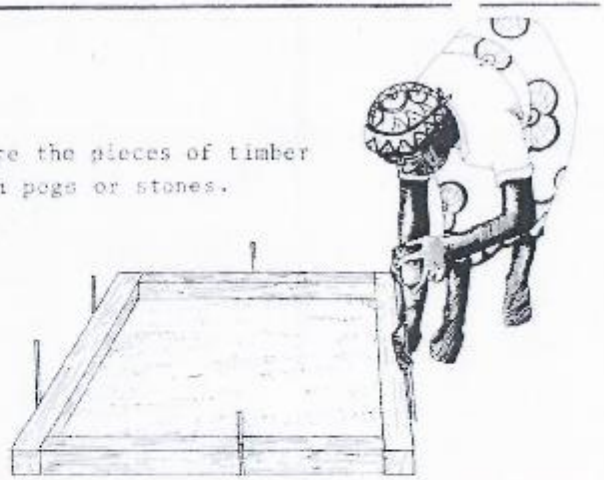


Assemble these pieces of timber such that the two of same length are opposite each other.

NB: The internal dimensions of the slab-form are equal to the ACTUAL dimensions of the slab that will be moulded in it.



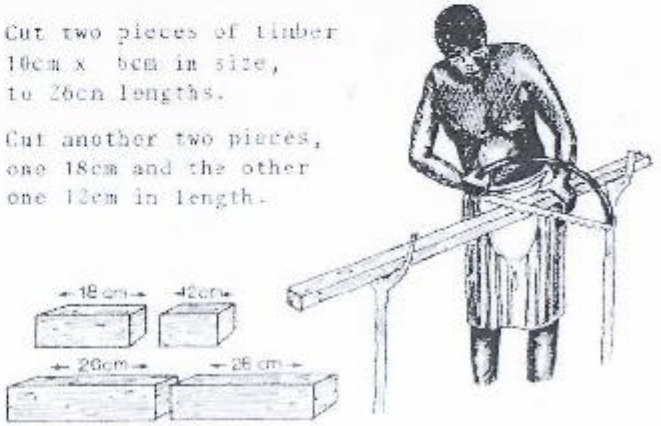
Brace the pieces of timber with pegs or stones.



Making Hole-Form

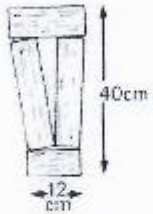
Cut two pieces of timber 10cm x 6cm in size, to 28cm lengths.

Cut another two pieces, one 18cm and the other one 12cm in length.



Assemble these in the centre of the slab-form such that the 12cm piece is opposite the 18cm piece to form a hole with the following dimensions:

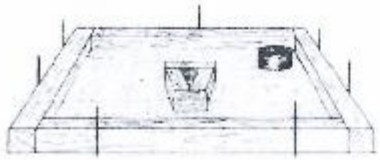
Length - 40cm
Widths - 18cm
- 12cm



Vent-Hole Form

The vent-hole should be round to suit the vent-pipe that will be installed. A socket ring of 10cm diameter is often used as vent-hole form although in other instances any round object can be used, especially cans or tins which will fit the size of the vent-pipe that will be installed.

Put the vent-hole form in the slab-form as shown.

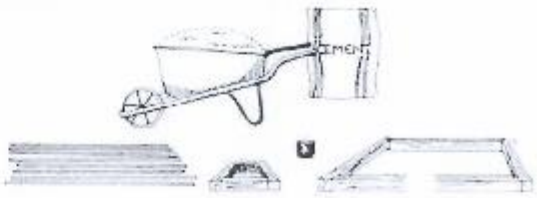


CONSTRUCTION OF CONCRETE SLABS

There are two types of concrete slabs:
(i) Concrete slab without crush stone;
(ii) Concrete slab with crush stone.

1. Concrete Slab Without Crush Stone

Materials Required:
(i) Two wheel barrows riversand (one wheel barrow for preparation of ground);
(ii) One packet cement;
(iii) Eight pieces re-infercement which are 95cm long each;
(iv) Wooden slab-form with internal dimensions 1m x 1m x 0.1m as described above;
(v) Hole-form with outside dimensions as described above, i.e.:
Length - 40-45cm
Widths - 18cm
- 12cm
(vi) Vent-hole form as described above.
(vii) Water



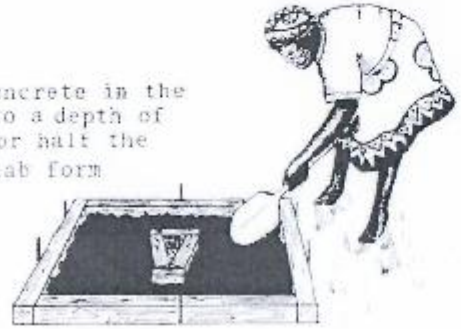
1. Concrete Mix

Mix concrete with correct proportions of cement, sand and water. It is very important to have a proper mix and proper preparation so as to have a strong, durable slab at the end.

The cement/sand ratio is 1:1, i.e., one packet of cement is mixed with one wheel barrow of river sand, then enough water is added to make a STIFF mix.

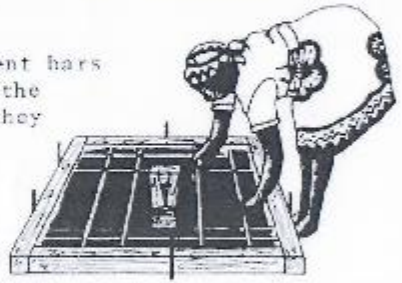
2.

Pour the concrete in the slab-form to a depth of 5cm (50mm) or half the depth of slab form

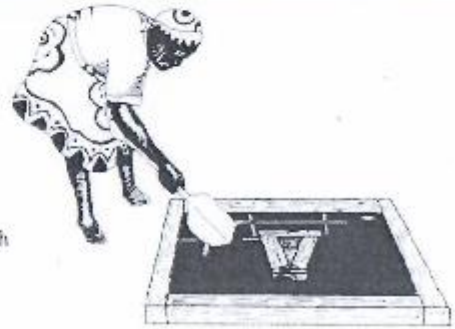


Smooth surface with a trowel.

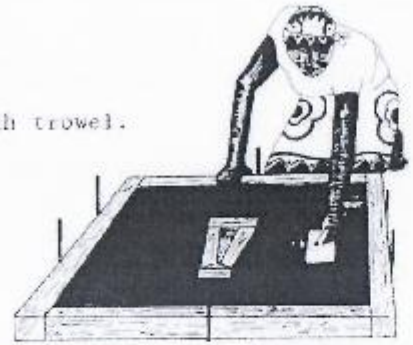
Set the reinforcement bars in place, i.e., on the concrete. Be sure they are positioned as shown.
Tie the iron rods together with wire where they cross.



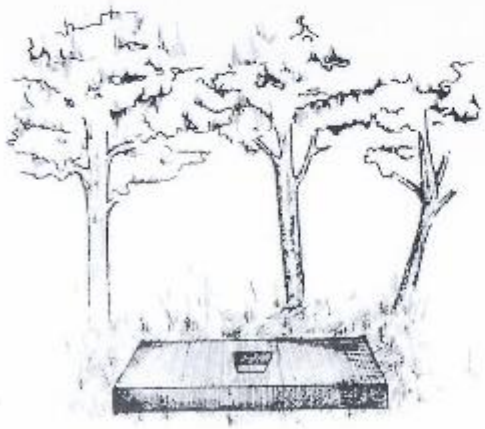
Pour in the remaining depth of concrete



Smooth surface with trowel.



Leave the concrete slab to set one or two days, then remove slab-form and hole-form. Keep the slab shaded and wet for four to six days until it has firmly set.



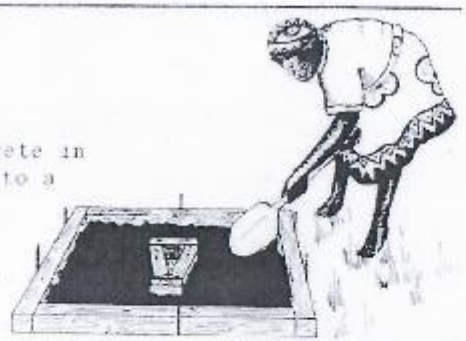
Concrete Slab With Crush Stone

A common mix volume is: 1:2:3 - ONE PART CEMENT, TWO PARTS SAND, THREE PARTS GRAVEL OR CRUSH STONE and enough water to make a fairly STIFF mix.

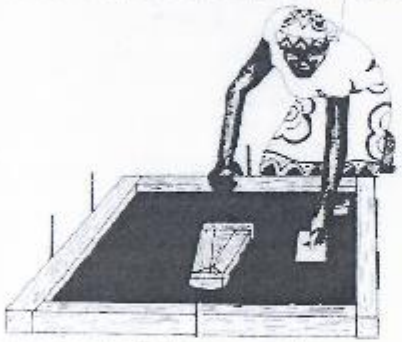
Remove any hard lumps of cement before mixing. All the aggregates should be clean, including the water which should also be clear drinking water, if possible.

Mix concrete with the correct proportions of cement, sand, gravel or crush stone and water. It is very important to have a proper mix and proper preparation so as to have a strong, durable slab at the end.

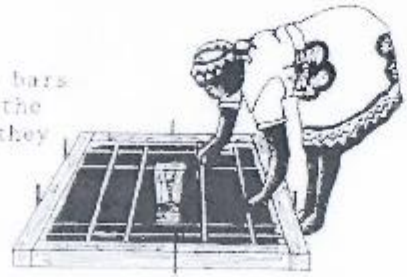
Pour the concrete in the slab-form to a depth of 5cm (50mm) or half the depth of the slab form.



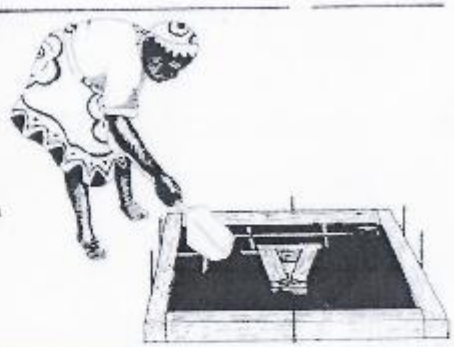
Smooth surface with a trowel.



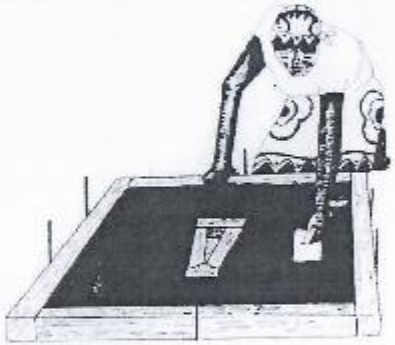
Set re-inforcement bars in place, i.e., on the concrete. Be sure they are positioned as shown.
Tie the iron rods together with wire where they cross.



Pour in the remaining depth of concrete



Smooth surface with a trowel.



Leave the concrete slab to set one or two days, then remove slab-form and hole-form. Keep the slab shaded and wet for four to six days until it has firmly set.

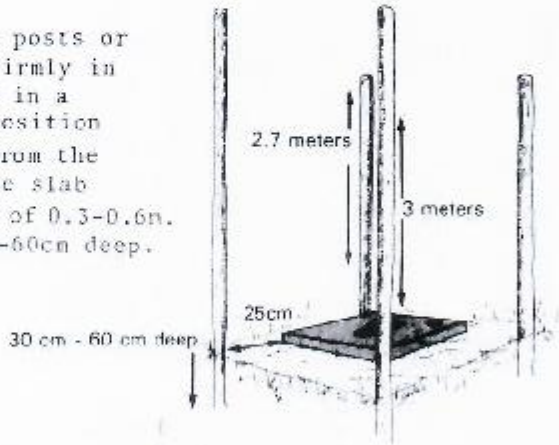
CONSTRUCTION OF PRIVY SHELTER

Walls

Cut corner posts or uprights to correct lengths:

- front posts should be about 3.0m long;
- rear or back posts should be about 2.7m long.

Set corner posts or uprights firmly in the ground in a vertical position 25cm out from the edge of the slab to a depth of 0.3-0.6m. I.e., 30cm-60cm deep.



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Fill in the space with cement

Build or weave together the screening material.

secure it to the corner posts with wire or equivalent. Begin at the end corner post and work your way around the screen.

The screen should touch the ground and be as high as the tops of the corner posts.

OR

Nail crossbraces to the inside edges of the corner posts and uprights. The top crossbrace should be at the height of the tops of the) walls. At front, the top crossbrace will define the top of the doorway, which should be at least 2.0m high.

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LOCATION OF HEALTH INSPECTORATE PERSONNEL IN SWAZILAND

Senior Health Inspector,
Ministry of Health Headquarters
Deputy Senior Health Inspector,
Ministry of Health Headquarters
Health Inspector, Public Health Engineering/MOH

Contact the above at:
Ministry of Health Headquarters
P.O. Box 5
Mbabane
Telephone: 42431

Health Inspectors/Assistants in Hhohho Region
Senior Health Assistant, Mbabane
Health Assistant, Siphocosini
" " Lobamba Clinic
" " Motjane Clinic
Contact through Ministry of Health Headquarters, Telephone 42431

Regional Health Inspectorate/Health Assistants in Piggs Peak Sub-region
Health Inspector, Piggs Peak Health Office
P.O. Box 110
Piggs Peak
Telephone: 71393
Senior Health Assistant, Piggs Peak
Health Inspector, Bulandzeni Clinic
P.O. Box 110
Piggs Peak
Telephone: 71392

Health Inspectors/Assistants in Lubombo Region
Health Inspector - P.O. Box 34
Senior Health Assistant Siteki
Telephone: 34414
Health Assistant, Empolonjeni Clinic
" " Lomahasha Clinic
Telephone: 38243
" " Tikhuba Clinic
Telephone: 34279
Health Inspector, Sithobela Health Centre
Telephone: 34374
Health Assistant, Sithobela Health Centre
" " Lubuli Clinic
Telephone: 30233
" " Siphofaneni Clinic
Telephone: 34361

10.5 Annex D. Typical Layout/Plan of Septic Tanks