



**SOUTHERN AFRICAN DEVELOPMENT COMMUNITY
NACALA ROAD CORRIDOR STUDIES**

**FEASIBILITY STUDY FOR ONE-STOP BORDER POSTS,
DETAILED ENGINEERING DESIGN AND LEGAL FRAMEWORK
FOR OPERATION OF ONE-STOP BORDER POSTS AT
MCHINJI [MALAWI]/MWAMI [ZAMBIA] AND CHIPONDE
[MALAWI]/MANDIMBA [MOZAMBIQUE].**

FEASIBILITY REPORT

**VOLUME 6:
ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT
REPORT**



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Otieno Odongo & Partners Consulting Engineers a recognized firm of Environmental and Social Impact Assessment (EIA) experts registered by the National Environment Management Authority (NEMA) Kenya hereby confirms that the content of this Environmental Project Brief is a true representation of the Environmental Impact Assessment evaluation of the proposed One Stop Border Post at Border Posts at Mwami/Mchinji and Mandimba/Chiponde border posts located The Zambia/Malawi And Malawi/Mozambique border crossing respectively.

Signed by the Environmental Expert:

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LIST OF ABBREVIATIONS

Abbreviation	Description
BP	Border Post
CO	Carbon Monoxide
CO₂	Carbon Dioxide
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EII	Environmental Impacts Identification
EIR	Environmental Impact Review
EIS	Environmental Impact Study
EMF	Electro Magnetic Frequencies
E&SIA	Environmental and Social Impact Assessment
E&SMMP	Environmental and Social Management and Monitoring Plan
HIV/AIDS	Human Immuno-Deficiency Virus/Acquired Immune Deficiency Syndrome
ICT	Information Communication and Technology
ID	Identity Card
IEC	Information Education and Communication
km/hr	Kilometer per hour

Abbreviation	Description
km²	Squared kilometers
m	<i>Meters</i>
NEAP	National Environmental Action Plan
NO	Nitrogen monoxide
NO_x	Oxides of Nitrogen
OOP	Otieno Odongo & Partners Consulting Engineers
OSBP	One Stop Border Post
O₃	Ozone
%	Percent
PPE&C	Protective Professional Clothing and Equipments
P.S.V	Public Service Vehicle
RIAM	Rapid Impact Assessment Matrix
RPF	Resettlement Policy Framework
SADC	South African Development Community
SO_x	Oxides of Sulphur
SPSS	Statistical Package for Social Sciences
STI's	Sexually Transmitted Infection
TOR	Terms of Reference
USD/\$	United States Dollars
WTO	World Trade Organisation

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1. Introduction

Otieno Odongo & Partners Consulting Engineers (OOP) has been assigned by The SADC Secretariat to undertake feasibility studies and detailed engineering designs for Two One Stop Border Posts (OSBP) at the border crossing at Mwami/Mchinji located at the Zambia-Malawi border crossing and Mandimba/Chiponde located at the Mozambique-Malawi border crossing. The assignment also encompassed undertaking an Environmental and Social Impact Assessment (E&SIA) study for the proposed projects. The objective of the proposed project is to establish joint control points at the border post with the view of eliminating unnecessary delays of interstate trade and transit traffic.

This E&SIA evaluation of the proposed two One Stop Border post located at the above-mentioned border crossing have been undertaken pursuant to the Constitution and environmental regulation of the various countries. The aim of this report is to give guidelines/TOR for future development of independent ESIA for each border post based on its respective countries regulation.

1.1 Project Objective and Justification

The overall objectives of the assignment as per the project's Terms of Reference (TOR) drawn by the SADC are:-

- conduct the feasibility study, preliminary design and detail engineering designs and preparation of bidding documents of the Malawi/Zambia and Mozambique/Malawi one-stop border posts and associated vehicle overload control facilities; and
- (to review the policy, legislation and regulations of the three countries and develop a legal documentation and institutional framework for operation of the OSBPs in common areas by border control officers from the countries sharing the border in accordance with agreed procedures for trade and transport facilitation.

The objective of this report is to provide the stakeholders with a brief on the environmental and socio-economic screening and scoping findings on the project area and to enable make an informed decision while evaluating the proposed project for approval or further studies.

The Objective of undertaking the environmental screening and scoping exercise was to:

- Identify and assess potential environmental and social impacts of the proposed project and recommend mitigation measures;
- Verify compliance of designs with the environmental regulations and industry's standards;
- Generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the project life cycle (construction, commission and decommissioning);
- Recommend cost effective measures to be implemented to mitigate against the expected impacts;
- Guide in preparation of an Environmental and Social Impact Assessment Report compliant to the policies, legal and, regulatory framework detailing findings and recommendations;

- Provide guidelines (environmental clauses) to stakeholders participating in the mitigation of adverse impacts of the project

The Objective of undertaking the socio-economic survey was to:

- a) Identify the activities currently being undertaken at the existing border post;
- b) Rate the services level being provided at the existing border posts;
- c) Evaluate effects of the existence of the border post to the household and community members in general;
- d) Identify the measures required to be undertaken in order to enhance the quality of service at the border post;
- e) Evaluate the quality of the hospitality facilities and commercial services at the existing border post;
- f) Study the sanitation situation at the existing border post;
- g) Gauge the prevalence of HIV / AIDS in the area;
- h) Study the current status of infrastructure in the project area;
- i) Evaluate the community members and other users perception on the formation of the One Stop Border Post.
- j) Determine the type of services and facilities required/expected at the proposed border post so as to ensure acceptability and sustainability;
- k) Study the land uses at the border post and determine the availability of land for future development

1.2 Justification of the project

The need of the proposed project is evident as currently inter-state and cross border traders are experiencing several challenges in their endeavour to reach their markets. Thus the development of a OSBP will enable improve efficiency in clearing traders at the borders. Major benefits that justify the implementation of this project are:

- Reduced/optimize border post running and maintenance cost;
- Enable comprehensive control of goods entering either country including controlled/hazardous substances;
- Reduce non-tariffs barriers being experienced by traders; and
- Increase efficiency at the border posts thus reduce delays.

1.3 Study Methodology

In order to comprehensively gather information on the environmental and social issues, the team of experts engaged various techniques in undertaking this study including the review of various literature materials, site visitation and guided consultation and interviews with key stakeholders.

The environmental evaluation conducted at the six border posts was undertaken in two forms namely:

- As Environmental audit of existing facilities
- and as an Environmental and Social Impact Assessment (EIA) for the proposed one stop border post at the four existing posts. The scope of the EIA study involved undertaking a socio-economic and bio-physical environmental evaluation.

1.3.1 Desk Study

A desk study was done through extensive review of various literature materials including the policies, legal/regulatory framework governing environmental management, catalogued materials on responsibilities of different players in the sector and reports with baseline information on the project area. Sources of this information were obtained from relevant Ministries, Customs, Immigration Officers, the district offices, Bureau of Statistics, Environmental Officers, Development Partners and the Internet (government website).

1.3.2 Field Work and Public Consultation

The consultant visited the project area so as to collect primary data on the existing situation at the border post. While there, the team also conducted guided consultation with existing key stakeholders through oral and written interviews using data collection tools such as checklists, matrices and questionnaires. Broad consultation involved conducting door to door household surveys to gather information on the socio-economic and, environmental indicators and one to one interviews with key stakeholders using structured questionnaires.

The socio-economic and environmental indicators surveys involved undertaking one to one interviews with various users of the border posts namely household, pedestrian and, cross border traders, vehicles drivers, accommodation service providers and border post officials (key stakeholders). Several social and environmental parameters were studied to enable gauge the current socio-cultural, socio-economic and, socio-environmental status of the project areas and its implication to the proposed project.

The indicators survey for the two border posts was conducted between 23rd August, 2013 to 6th September, 2013. The survey included field visits and interviews with targeted key stakeholders at the border post, environmental agencies. A total of two hundred and eleven (211) respondents from the general public which encompassed sixty four (64) households, seventy (70) Pedestrians and, cross border traders, fifty four (54) Vehicle drivers; and twenty four (24) accommodation facilities were interviewed. The survey was conducted as face to face interviews at the offices, at household and street level with the help of thirteen (13) data enumerators who were inducted on guidelines of undertaking the survey. The sample selection criteria were also incorporated in the induction phase to ensure the selection of a representative sample. Main population clusters or study zones were identified in the two border posts of the three study countries namely Zambia, Malawi and Mozambique. Respondents interviewed were distributed across the proposed project area. The survey was conducted using different data collection instruments for the different categories namely

household category, Pedestrians & Cross border traders' category, vehicles services category and Accommodation category.

List of the key stakeholders interviewed and the findings of the consultations can be found in annex 1 of this report while the templates of questionnaire used for data collection and the findings of the survey can be found under annex 2 of this report respectively.

Detailed visual inspection (critical observations) were also carried out in the project area to get an impression of the status of the bio-physical environment and this involved studying the project area for available natural resources; gauging the sanitation situation such as water supply, solid waste management and, liquid waste management; identifying the land use, land development trends, settlement setup and development plans.

1.3.3 Literature Review

Several literature sources were referred to in order to obtain data for project evaluation this included district development plans, environmental impact assessment reports for other projects in the area, legal and regulatory framework documents, One Stop Border Post Source Book, among others. The data collection through document review was guided by impact evaluation tools.

1.3.4 Gaps in Knowledge and uncertainties

The study experienced several challenges one of them being access to information and project sites. This was mainly experienced in Zambia where the stakeholders wanted to be Authorised by their own head of departments to provide information.

1.4 Data Analysis and Findings of Data collection

The data collected through the field work and standardized questionnaire was checked for consistencies before the analysis and coding process started. The data was analyzed using descriptive statistic tools embedded in software such as the Statistical Package for Social Sciences (SPSS) program and microsoft excel for Windows. These tools enabled measure the respondents' socio-economic information, such as their views on the effects of the proposed border Post, by user group. Tools used include frequencies, percentages, means, cross-tabulation, standard deviation, as well as statistical tables and charts. The resultant product was used to compile this report and the study findings are discussed in this section.

The survey indicated that the various users' are benefiting from the current border posts despite the several challenges they are facing. The main challenges being faced by the users include inadequate social amenities/infrastructure such as sanitation facilities, water, accommodation facilities, and commercial facilities such as banks. Majority of the users were aware of the HIV/AIDs pandemic and its required mitigation measures. The overall expectation of the border post users is that the development of the OSBP shall improve level

of service provision at the posts though they had mixed reactions on the type of OSBP to be developed; the majority of vehicles/commercial users preferred a common border post as this will save them time in processing their travel/goods movements documents while the other users preferred the type of OSBP selected to be in their countries of origin as they shall be more comfortable processing their travel documents in their own home country.

The field survey and site visit also indicated that land acquisition should be undertaken at Mwami in Zambia, Mchinji and Chiponde in Malawi and Mandimba in Mozambique. Site visit findings and stakeholders consultations revealed that the land neighboring the border posts are customary land and apart from Mchinji who had undeveloped land around its offices the other border posts had dense settlements around it. The land at Mchinji border post was acquired from the locals and has been reserved for the development of staff quarters thus there will be need to acquire more land for the OSBP. In Mandimba/Chiponde it was proposed that the BP be moved closer to the official boundary which is about 4km from Chiponde BP. This shall necessitate land acquisition as the land is customary land.

The key stakeholders interviewed included the border post officials, departmental heads involved in environmental management which included the Environmental Impact Assessment Section in the Environmental Affairs Department under the Ministry of Natural Resources, Energy and Environment Affairs in Lilongwe. The border post officials are optimistic about the project but were reserved on the use of common facilities and stated they prefer the juxtaposed type of border post. The main concern of stakeholders mandated with environmental management in the various countries was that project impacts should be mitigated against and they should meet the countries legal requirements on environment. The consultant has taken that into consideration by citing legal environmental requirements that the project is required to adhere to. The main legal concern is development of Project Briefs to be submitted to the Environmental Authority for review and practicing of environmental conservation, restoration and mitigation of social impacts which includes compensation of affected people. The findings from the key stakeholders discussions were used to guide develop mitigation measures.

1.6 Socio-Economic Study Findings and Analysis

This section provides a brief on the findings of the primary data collected through the socio-economic survey conducted in the project area.

1.6.1 Demographic Characteristic and Education Level

According to the sample distribution of the household socio-economic survey by age and sex, the range of age of the respondents was between 18 and 54 years and there were slightly more female respondent at the household level as compared to their male counterparts and this was attributed to the fact that most women work within the household thus their availability during the survey. Majority of the respondents had attained full primary level education with a few stating secondary and training institution as their highest level of education.

On average five (5) people live in the same household in the project areas, however, in Mandimba, Mwami and Chiponde has a good number of households with upto 9 persons per household.

1.6.2 Household Income generating activity and Expenditure

15.4% of the population stated that at least 2 persons per household are employed and 37% of the household interviewed stated the same persons are involved in business. Interviews undertaken to clarify the information indicated that the community members at the border post tries to engage in a business even those employed undertake their own side business most of which is small scale trading of goods and food stuffs. The main type of employment in the area is teaching at 60% and shop attendants at 20%. The main type of business undertaken at the border post are informal small scale trading and this includes vending at 47%, shops (wholesale and retail) at 24%, hotel and bars in Mwami at 18% and, hawking and grocery at 6% each. The key income generating activity in the areas was farming which accounts for 55% followed by business at 16% while employment contributed 5% of household incomes. The main farming activity are growing of cash crops rated at 70% , subsistence farming which account for 33%., livestock keeping accounts for 11% and those who engage solely in agribusiness accounts for 9% and was reported in Mwami (8%) and Mandimba (1%).

The per annum earning from each of the economic activities undertaken at the border posts varied. In farming Mchinji reported the highest earning of USD 895 per annum followed by Chiponde at USD 476, then Mwami at USD 368 then Mandimba which indicated households earn an average of USD 80 from farming per annum. In regards to employment only Mwami and Mchinji responded stating the average annual earnings from employment are USD 1022 and 840 respectively. Persons in Mwami indicated that they earn an average income of USD 1028 from business while those in Mchinji and Chiponde reported an annual earning of USD 438 and USD 61 respectively.

Most households had a problem quantifying their average monthly earnings and more so their expenditure as majority of the people do not keep records of their income and expenditure. 54% of the population spend less than USD 100 per month and most of them 54% managed to buy a bicycle in the last three years; 5% managed to buy a car and 3% land.

1.6.3 Perception on the existing border post and the perception of the proposed development

The survey established that at least 62 percent of the household respondents in the sampled area utilize the services of the border post; and 38% indicated that they do not use the services. The main users of the border post were pedestrians and cross border traders who reported they cross the border mainly on a weekly basis with pedestrian rating at 40% and vehicles 41%.

Pedestrians and vehicles crossing on a monthly basis accounted for 41% and 43% respectively. Consultations with the border post officials indicated that most of the cross border traders do not use the border post thus the low recording of daily usage of the facility which the survey found to be 11%. In regards to the perception of the border post the 57% of the pedestrians rated it as good or very good; 34% rated it as satisfactory and 10% rated the service as poor.

1.6.4 Means of crossing the border post

63% of respondents who cross the border frequently confirmed that they cross the border using bicycles, 21% stated they use private cars (local taxis) while 17% stated they cross on foot. This is because the main business centres are located far from the border post forcing those using the borders to use various modes of travel. The respondents stated they cross the borders for various reasons, majority, however, who accounts for 26%, cross the border to visit friends and relatives while 24% cross to purchase goods for business, another 25% cross to purchase goods for personal use and 23% cross to attend to work in the private sector (13%) and Government sector (10%). Those transporting goods indicated that they transport export goods (84%), Petroleum products (8%) and those ferrying passengers accounted for 8%.

1.6.5 Clearance at the border post

77% of vehicles and 55% of the pedestrian and, cross border traders interviewed indicated that they go through border clearance procedures every time they cross the border as. The number of vehicles that clear is high because they need to undergo separate screening to ascertain their origin and, final destination, type of goods being transported and to collect payment of duty for goods crossing the border.

The survey revealed that sometimes a few respondents do not undergo the clearance procedures while others don't go through the procedures at all. Majority (64%) of the respondents using vehicles to cross the border cited that they do not clear at the border post as they have permanent authorisation permits another 21% stated they do not clear as they are known at the border post 7% stated they cross when the border post is closed and another 7% stated they do not clear as they believe the border post is one community.

1.6.6 Rating of the border post services by respondents

The existing border posts services ratings differ from one category to another, for instance majority of the household users (67%) rated the services at border post as good or very good while 33% rated it as satisfactory or poor. 70% of vehicle users and 44% of the pedestrians rated the service as poor while 44% of accommodation category rated as good.

1.6.7 Suggestions to enhance the quality of border post services

The respondent stated the following as areas requiring enhancement: security, time management/shorten clearance time, tax reduction, staff training, introduction of ICT, introduction of I.D for those who frequently crosses the border, free movement, introduction of 24hrs services, provision of banking and business facilities, provision of hospitality facilities (restaurants, accommodation etc) and electricity supply in the area.

1.6.8 Effects of the existing border post to surrounding communities

The existing border posts have had a positive impact on locals. Respondents from both household, general public and accommodation category concurred that the conducive business environment enjoyed by persons involved in business activities is as a result of the existing current border posts. This is due to availability of ready markets, cheaper sources of goods and raw materials and availability of clients.

1.6.9 Perception of the proposed One Stop Border Post

Most respondents from household category felt they were not going to be affected, however, majority of respondents from both Pedestrian & Cross border traders category and Vehicles services category felt they were going to be affected.

1.6.10 Effects of the formation of the One Stop Border Post

The formation of One Stop Border Post is seen to be an ideal option as stated by respondents from all categories as they mentioned that it is likely to impact them positively by saving them time , improve their businesses, enhancement of peace, curb corruption and increase competency among the staff.

1.6.11 Preferred side for the location of One Stop Border Post

Majority of respondents from the three categories i.e. Household , Pedestrian & cross border category and vehicles services category would prefer the border post to be located in their countries of origin suggesting that the idea of One Stop Border Post is highly accepted. Majority of respondents from Accommodation category would prefer if the location was to be in the neighboring country in order to necessitate easy accessibility of clients to their facilities.

1.6.12 Services & Facilities currently available and those to be included in the new One stop Border Post

The respondents stated that the services they would like to be included in the OSBP are weighbridge, enhanced communication network, shops, police station, medical facilities, adequate water, business institutions such banks, hotels, other social amenities and improved infrastructure.

1.6.13 Hospitality facilities & Services available at the border post

According to the survey, there were very few accommodation facilities within the border post. Mwami had most of its facilities in Chipata town 22km away, Mchinji had its facilities at Boma located 7km away, Mandimba had facilities at the Mandimba village 4km away and Chiponde had them located a few m away but were of very low standards. The respondents indicated that the social amenities at the border post offer several services ranging from bed only to internet services. The services offered, however, vary in each facility. Amenities offering services such as bed only, breakfast and dinner accounts for 50% or more indicating that these services are the most commonly offered services by the facilities in the sample area. Services such as cleaning, maintenance and Internet are rarely offered by most facilities in the sample area.

In regards to the rating of level of service offered at the social amenities the respondents rated accommodation services at 65% above average, bathroom services 62%, food services 59%, toilet services 59% and entertainment services 53%.

Despite the fact that accommodation facilities are available at the border posts, at least 47% of long distance travelers who traverse the borders, sleep in their trucks. The greater majority who sleep in the truck indicated high cost of services, inadequate facilities and insecurity as the factors determining their sleeping points.

1.6.14 Availability of Social-Amenities at the hospitality facilities

Electricity is the main source of energy for the hospitality facilities as per 91% of respondents who are working in the hospitality industry and 96% of respondents from vehicles services category. The survey further indicated that the majority of the accommodation facilities lacked telephone services, hence making communication within the facilities difficult as stated by those interviewed.

1.6.15 The cost of single rooms

A random survey to determine the average cost of single rooms offered by the accommodation facilities in the sample areas revealed that the costs varied from country to country as the cost is also determined by the quality, site and the available facilities within the rooms. The costs stated by the respondents ranged from 5-30 United States Dollars (USD\$).

1.6.16 Availability of condom dispenser within the room

On overall up to 58% of respondents from the accommodation category, confirmed availability of condom dispenser in the rooms, however, only 33% of respondents in Chiponde/Mandimba sample area confirmed availability of this commodity in the rooms thus suggesting that provision of condoms in the room is either not a priority, it is expensive or its due to limited sources as informed by the hotel owners.

1.6.17 HIV/AIDS mitigation

According to the survey conducted, it was noted that most respondents from all categories are informed on the existence of the HIV /AIDS pandemic which was rated at 100% for truck drivers and 99% for pedestrians and cross-border traders. The respondents stated that their main sources of information on HIV/AIDS pandemic are the Radio and friends. Despite stating the above sources all the respondents had gotten a form of training or awareness through campaigns conducted in the area by either teachers, doctors, preachers, films/plays or NGO's. It was acknowledged by majority of respondents that, there is sufficient message to create awareness about HIV/AIDS and STDS in the community.

The survey also aimed to find out if the respondents were aware of ways of preventing HIV/AIDS and the findings indicated that they were aware and they indicated that the use of condom and abstinence are the best ways to prevent HIV/AIDS infection, suggesting that they are the most preferred means of prevention. Over half the population in the sampled areas has used a condom, indicating that condom is the first choice of protection in the sample area. As for the other half that has never used a condom, religious and cultural beliefs were cited as the main reasons that have barred them from using condom as a way of protection.

According to the study findings, the male condom is widely used as compared to the female condom; this could only imply that many people are not aware of the existence of the female condom and that men are the determining factors on whether to use or not to use condoms as a way of protection.

1.6.18 Caring for HIV/AIDS patients and availability of testing facilities

The survey sought to know the extent at which respondents were informed on how to care for HIV/AIDS patients. Majority (50%) stated that medication should be provided followed by counseling at 40%, nutrition at 38% among others. It was clear, however, that protection and care were not distinguished but treated as same. They added that facilities offering assistance or advice or both on HIV/AIDs are available in the project areas and they include Mobile Voluntary Counseling and Testing facilities. Though it was noted that majority of the respondents from household and pedestrian and, cross border category have never accessed these available facilities despite being at there disposal, however 61% of respondents from Vehicles category have utilized the services.

Further inquiry on why a large number do not use the HIV/AIDS testing facilities, it was stated by 32% of the respondents from the household category that they believed they were not affected or infected in any way, 21% stated they lacked interest, another 21% lacked confidence with the services offered by the facilities. The respondents from Pedestrian & Cross border traders category cited lack of confidence (55%) on the services offered at the facilities and lack of interest (20%) with the facilities among other reasons. Respondents from Vehicles services category cited lack of confidence and lack of interest. Respondnats who do not use the facilities or are not satisfied with the level of service further stated that cost of services at the facilities were high and that they have to travel long distance to reach them. This implied that the services ought to be nearer and cheaper if not free to enable all access them.

2 Project Description

The delay in cargo clearance has been cited as one of the major non – tariff barriers that affect

trade at the border posts and other border posts in the project countries and neighbouring countries. This results in high cost of imported goods, high cost of production, high uncompetitive pricing of locally manufactured goods and high cost of freight transportation in general. These delays are due to poor institutional and management systems, inadequate physical infrastructure and services; like IT; required to support cross border cargo management. Studies have shown that if the regulators performed their duties jointly in the importing country or in a joint Border Control Zone then goods and persons would make one stop only while crossing the border hence “one stop border post (OSBP)” concept.

The One Stop border posts concept is already in operation at the Chirundu border post located between Zambia and Zimbabwe and several other border posts in various countries in Africa are at the planning or development. Some of the border posts which have already undergone feasibility studies include those borders found along the Northern Corridor, among them Malaba in Uganda, Busia in Kenya, Gatuna at Rwanda/Uganda, Namanga at Kenya/Tanzania border and Lunga lunga at Kenya/Tanzania border just to mention a few.

The Southern Africa Development Community (SADC) now seeks to prepare an economic feasibility study and detailed engineering design for the development of one stop border posts at Mwami/Mchinji and Chiponde/Mandimba at the existing border crossing at the Zambia/Malawi and Malawi/Mozambique respectively.

The hard and soft infrastructure at these posts is scanty resulting in substantial non tariff delays. The Border Posts are not fenced, the border lines are transparent and the border post are surrounded by settlements which make it hard to gauge the economical impact of movement of the local people and goods.

2.1 Nature of Proposed Project

The design of the proposed project has taken into consideration three options of One Stop Border Post (OSBP) as listed below.

- Common Border One Stop Movement
- Straddled One Stop Movement Pattern
- Juxtaposed One Stop Movement Pattern

The common OSBP is where common border post facilities are developed in one of the two bordering countries based on mutual agreements and the border personnel all work in the facilities developed for that purpose in that country. The Straddle OSBP is developed in the middle or centrally between the two neighbouring countries mainly on the no man’s land this also requires mutual agreement between the two countries and the personnel also share all facilities. While juxtaposed OSBP is development of facilities in each country but when it comes to personnel a form of exchange takes place and the two offices have personnel from either country working together with their neighbours and they also share information processed at the border. Copies of the concept designs of the three possible options of OSBP are found under appendix 5 of this report.

The type of border post to be developed at each border post has not been settled on yet as further discussions and agreements need to be developed. Study findings through observations and consultations indicated that the juxtaposed OSBP will be the best options for the border posts. Several criteria need to be analysed for the selection of the type of border post to be developed and this includes nature of project's bio-physical, socio-economic environment and the regulatory framework that can facilitate development of the OSBP.

The overall output of the project is to develop infrastructure that shall support the efficient running of the chosen option of the OSBP. To achieve this objective the architectural concept designs has incorporated the following components:

- **Offices and support facilities:** The offices shall accommodate the customs and immigration officers, other government agencies warehouse, vehicle Impound Area, inspection facilities and washrooms for staff and public

The customs Office will have facilities for the following: the manager, Officer – In – Charge, Chief Preventive Officer and pool office, Customs Service Centre, Enquiries Counter, Inspections, Archives, Registry and Server room

The immigration office will have the following facilities for the following Officer – In – Charge, Shift – In – Charge, Immigration officers, Secretary, Holding rooms, Interview Room and Archives

The Government Agencies to be accommodated includes health officer, anti-drug officers, security personnel, Livestock and Fisheries Officers, Bureau of Standards officers among others

- **Parking:** Development of strategically located parking lots with adequate capacity for easy flow of traffic and.
- **Verification Shed:** The shed will have an area of 400M², have a capacity to accommodate 5 Trucks and will have the following facilities counter positions, writing tops, waiting areas, queuing space, lounge, washrooms
- **Roads**
- **Fencing / Site Security**
- **Water and Sanitation**
- **Electricity Supply**
- **Fire fighting Installation**

2.2 Main Project Activities

The main activities that shall be undertaken during project establishment is construction of new buildings and, installing of furniture and ICT equipment's once the building structure is

completed. Several construction associated activities shall be undertaken at this phase of the project and this shall include: site clearance, excavation, construction, interior fittings/finishing and, mending activities sourcing of construction material, transportation of the materials, connecting electricity to the new structure, provision of sanitary facilities, and painting among others.

Site preparation and clearance shall involve land acquisition, clearance of vegetation which is mainly grass as the few trees found on site shall be preserved. The Land in the project area is customary land and shall need to be acquired as per the legal laws governing in each country. Vegetation clearing and soil excavation shall be done manually using hand tools such as slashers, pangas, hoes, mattock, spades and forks. Construction activities shall also be labour intensive and will involve use of manual and semi-automatic equipments such as concrete mixers, hand drills, shovels among others. The semi-automated equipments will use electricity and in case of power failure will be run using fossil fuel mainly diesel.

Construction activities will involve use of cement, sand, stones, water, roofing materials, electrical fittings all of which be sourced locally. Interior finishing and fitting shall include painting, installation of furniture and Information Communication and Technology (ICT) equipments and gadgets. The ICT equipments to be installed shall include computers, x-ray units, printers, photocopiers, servers and satellite dishes.

Water for construction shall be sourced from the boreholes found within the BP

The main activity that shall be undertaken during the operation phase of the border post is provision of clearance services for goods, vehicles and people. The main input at this phase shall be stationary, human resource, ICT and electronic equipments which shall be sourced from within the country. The expected outputs at this phase are solid waste, liquid wastes, vehicle emissions, electronic waste, organic wastes and controlled substance wastes.

2.3 Baseline information and alternative consideration for the Chiponde-Mandimba border post

2.3.1 Project Site Description







The border post does not have heavy localised pedestrian and vehicle traffic apart from during the market days where the human and non-motorised traffic is high. The border posts are located 7 km apart which makes it operate inefficiently especially in terms of cross border trade. There is need to move the border posts closer to the border line and to reduce border transparency. The Chiponde border post site is surrounded by settlements while the Mandimba one is located around 3 km from settlements. The land near the border line is customary land owned by the locals and is not occupied with structures/homestead but is used as farm land on either side of the border.

The border post depends on onsite sanitation facilities and boreholes as sources of water. The site has no solid waste management facilities thus waste is dumped in open pits.

The border post is not located near natural resources but one of the tributaries of the Mandimba river is located 3km South-West of Chiponde BP. The river forms part of the wetlands that feed Lake Chuta (Malawi) and Amalamba (Mozambique) located 25km away from the BP.

The Mandimba River flows both to inland Malawi up to Lake Malombe via Shire river and to Zambezi River in Mozambique. Therefore project spill over effects from the project should be controlled to avoid affecting the ecosystem.

Vegetation cover at the project site is scanty as deforestation is high in the area. The air quality in the project area was seen to satisfactory as no major source of emission was present in the area and emissions from cars were seen to be diluted due to the openness of the area.

	
<p>Plate 2.3.1(a): General pictoria view of Mandimba town</p>	<p>Plate 2.3.1(b) General pictoria view of Mandimba town</p>
	
<p>Plate 2.3.1(a): General pictoria view of Mandimba town</p>	<p>Plate 2.3.1(b) General pictoria view of Mandimba town</p>
	
<p>Plate 2.3.1(e) Section of Mandimba River in Chiponde</p>	<p>Plate 2.3.1(f) Environment surrounding the Mandimba River in Chiponde</p>

2.3.2 Project Disitrcet Information

The two border posts are located between Malawi and Mozambique and are situated four and one kilometer from the borderlines respectively. The reason why the border posts are located far apart is because the actual location of the boundary between the two countries at that area had not been demarketed when the border post were being built. The Malawi and Mozambique government recently installed intermediary beacons at an interval of 200-500m along the entire border as the nearest beacon was 52km away North of the area. The area is generally flat with a gentle slop.

Chiponde is locate in Mangochi District which is situated in the Southern Region of Malawi (at the Southern end of Lake Malawi). The District entirely surrounds the eastern tip of Lake Malawi. The district shares boundaries with the following districts: Machinga in the South-East, Balaka, Ntcheu and Dedza in the South –West, Salima in the North and shares an international boundary with Mozambique in the East and North East. Chiponde is located along the Bakili Muluzi Highway namely road M3 road approximately 50Km South East of Mangochi town which is the district headquarters.

Mandimba located at Latitude: 14° 21' 04" S and Longitude: 35° 36' 13" is the district headquarters of Mandimba District located in Niassa Province in North-West Mozambique. The Mandimba town is located 144km from Lichinga the Niassa provincial headquarters and 4km from the Mandimba border post.

The climatic zone of Chiponde is similar to that Nawera located in the Eastern highlands of Mangochi District. The area has cooler temperatures and receive more rain as compared to other parts of the District. Generally the area experiences warm tropical climate with mean annual temperatures ranging from 18 to 32 degrees. The lowest temperatures are experienced in June and July while the highest temperatures are registered between the months of October and November. The dry season in Mangochi extends from May to October.

The temperatures of Mandimba are High: 34°C and Low: 22°C

2.4 Baseline information and alternative consideration for the Mwami-Mchinji border post

2.4.1 Project Site Description

The border posts are located in Mchinji and Chipata district in Eastern Zambia and Western Malawi. The border post are separated by the border line and surrounded by settlements. The Mwami border post is surrounded by the border post staff quarters while in Mchinji is located adjacent to villages.

The border post also depend on onsite sanitation facilities and boreholes as sources of water. The site have no solid waste management facilities thus waste is dumped in open pits.

The border posts are located near a gazetted forest Mchinji forest which is shared by both Malawi and Zambia. The rate of deforestation is high in the forest due to lack of control including border control. The disitrcet suffer as forest products are exported without the pay of duty. It is therefore important that plans are developed during the development and operation

of the BP to control deforestation and its impact on the ecosystem as the forest also is a source most of the rivers that serve Lake Malawi.

2.4.2 Project District Profile

Mchinji is one of the nine districts in the Central Region of Malawi. Mchinji district has an area of 3,356 square kilometers (335,600 hectares) and it represents 3.6% of the total land for Malawi. It borders with Kasungu District to the north, Lilongwe District to the east, Zambia to the west and Mozambique to the south. The district headquarters (Boma) is located along the main road (M12) that connects Lilongwe and Zambia. It is 109 kilometers away from Lilongwe City, which is the Capital of Malawi, and about 12 km away from the Zambia/Malawi border at Mwami. Figure 1.1 on page 2 shows map of central region of Malawi depicting location and boundaries of Mchinji District.

Mchinji lies between 1,200 and 1,829 meters above sea level. It has two district terrains. The hilly western part, consisting of Mchinji mountain ranges, has gentle slopes that are 1,600 – 830 metres above sea level. Almost all rivers found in the district originate from these hills. The remaining part, which forms the biggest part of the district, lies within a plain of mostly arable land, Dambos and waterways drain the plains into Bua and Rusa rivers as shown.

Mchinji is situated in the hilly areas of the district and is generally cool and wet with mean temperatures ranging from 17 ° C to 19 ° C per annum. Lowest temperatures are experienced in June while higher temperatures are registered during the months of October and November. In contrast, the plains are generally warm and dry with mean temperatures varying from 19°C to 21°C. Like most districts in Malawi, Mchinji has two seasons. The dry season runs from May to October while the wet/rainy season runs from November to April. The hilly areas receive average rainfalls of between 1000mm and 1230mm per annum. The plains receive less rainfall, generally ranging from 80mm to 1030mm per annum. The District has experienced significant climatic changes in the last nine years. Rains have been erratic, with the northern and eastern parts of the district experiencing serious droughts. Consequently, most communities consistently experience shortage of water for drinking, livestock production and crop production.

The 2013 population of Mchinji District is projected at 549, 307 with Mlonyeni location where the border is located has a population of 37,179.

Agriculture is the main economic activity of the district which is done as small scale level accounting for 167,731 ha but estate level or large scale also exists accounting for 91,329 ha. Major crops which are grown in the district are maize, groundnuts, tobacco, potatoes, sweet potatoes, cassava, Soya beans, beans and red beans. Major crops are defined as those crops that cover more than 5% of cultivated area. Minor crops grown in the district are cotton, rice, paprika, sunflower, sorghum, potatoes, ground beans, cow peas, vegetables, fruits and millet. Minor crops are defined as those crops that cover less than 5% of cultivated area.

Livestock in the district is kept as a social amenity or asset for social status especially among the Ngoni. Cattle bulls are used to plough and pull ox-cut. The district has a total animal population of 2,186,492 by 2012 and most of these are small animals

Mchinji Boma, Kamwendo, Mikundi, Nthema, Waliranji, Kapiri, Nkonkha, Chiwoshya and Mkanda produce the main markets in the district where people sell and buy foods every day and on specific market days. There are other Satellites markets scattered in the district, operating once week.

Micro, small and medium enterprises are prominent in the commercial and industrial business. Retail trading of several merchandises such as groceries, clothes, food items, and agricultural produce are major business occupations. Most people are engaged in petty trading because of Limited working capital as well as business and credit management skills

The district being a border town is concerned about cross border immigration which is under the Immigration department whose role is to prevent illegal entry in the district and also to take to task those who reside in the district without a permit. The District has some Burundians, Rwandees, Tanzanians, Zambians and Mozambicans residing in the District without permit. These people sometimes pose security threats to the residents of the District. They usually take advantage of the district porous borders and lack of national identification for the District. Records from the department shows that there is a growing number people who are denied entry at the border due to presentation of wrong documents or no VISAS in Mchinji Boarder. Though the number of Asylum Seekers has reduced as in 2007 they were about 84 and 9 in 2012. There is growing number of prohibited immigrants.

3. Policy Legal and Institutional Framework

3.1 Introduction

The Environmental Impact Assessment (EIA), is a requirement according to the legal and regulatory framework of each country. EIA is a development planning tool that identifies the actual and probable impacts of a proposed project to the environment. The tool enables timely identification of practical and applicable mitigation measures to facilitate reduce the anticipated negative impacts and optimize the positive impacts.

The EIA process enabled the consultant's study the proposed project's life cycle and develop appropriate recommendation on environmental management which shall ensure minimum negative impacts are transferred to the bio-physical, socio-economic and socio-cultural environment.

The environmental and social impact assessment study involved desktop review and consultations on the environmental regulatory framework for each of the three states and the findings are discussed below. According to our findings it was noted that the four countries have reached different levels in formulating the environmental laws despite that, several other pieces of regulations related to environmental conservation and management exists thus providing guidelines on precautionary principle of environmental management. These guidelines come in form of treaties, protocols, plans, conventions and development partners safe guard policies and procedures as the World Bank Policies. In addition to that the countries are all SADC members

3.2 Environmental Policy, Institutional and Legislative Framework in Republic of Malawi

The EIA section of the Department of Environmental Affairs works under the guidance of the by the Environmental Management Act of 1996 and its subsequent supplement the EIA regulations of 1997 which aims to ensure sustainable project development. The law requires all new projects to undergo an EIA and submit reports to the department for review and advice on the way forward before licensing a development.

The environmental regulatory framework is supported by other national pieces of legislations which include:

3.2.1 Land Resources Legislation

Land resource legislation that governs developments are:

- Land Act (CAP 57.01) – provides guidelines for customary, public and private land, use of land, trespass and encroachment.
- Registered Land Act (CAP58.01) –the law governs registration of title, land and dwellings on registered land.
- Customary Land (Development) Act (CAP 59.01) –The law provides guidelines on rights and interests in customary land including land allocation; aim to promote better land development.

- Local Land Boards Act (CAP 59.02) – establishment and power of Local land Boards – control of land transactions.
- Land Survey Act (CAP 59.03) – land surveys, licensing and control of land matters.
 - Land Survey Registration Board advise on Act
 - Land Survey Rules – provisions on survey methods
- Planning Sub Division Control Act (CAP 59.04) – subdivision of land outside town planning areas.
 - Advised by Control Board
 - Supported by Town Planning Court under Town and Country Planning Act.

3.2.2 Water Resources Legislation

- Water Resources Act (CAP 72.03) – controls the use of water resource: water rights, pollution of public water: can designate controlled areas to protect water supplies.
- Water Resources (Water Pollution Control) Regulations – control of water pollution discharge of effluent into public water: analysis of water and effluent.
- Water Works Act (CAP 72.01) - establishment of water boards and water areas; injury pollution of water and earth.

3.2.3 Plants Animals Legislation

- Fisheries Act (CAP 66.05) – regulation and control of fishing, prohibits use of explosives and poison. Supporting legislation on various aspects and fishing methods.
- Crocodiles Act (CAP 66.06 – control and protection of crocodiles.
- Forest Act (CAP 63.01) – control and regulation of forest products, declaration of forest reserves: protection, control and management of forest products tree planting and enterprises.
- Forest Rules – regulations in forest areas reforestation, felling, etc.
- Plant Protection Act (CAP 64.01) – eradication of pests and diseases, export and important of plants.
- Noxious Weeds Act (CAP 64.02) – eradication of noxious weeds
- Special Crops Act (CAP 65.01) – controls development and marketing of crops, flue cured tobacco, cashew nuts, cotton, groundnuts, tea.
- Tobacco Act (CAP 65.02) – production, manufacture and marketing of tobacco.
- Cotton Act (CAP 65.04) – production, marketing and processing of cotton
- Council For National Herbarium And Botanic Gardens Of Malawi Act (CAP 41.SC) – development and management of herbarium and botanical gardens.
- National Parks Act (CAP 66.07) – establishment of national parks, preservation of animals vegetation and objects of special interest in parks.
- GAME ACT (CAP 66.03) – preservation and control of game in controlled area and game reserves.
- Control And Diseases of Animals Act (Cap 66.02) – control of animals diseases.

3.2.4 Minerals, Chemicals and Pollution Legislation

- Mines And Minerals Act (CAP 61.01) – regulates the search and mining of minerals protection of the environment and natural resources.
- Petroleum (Applications) Regulations (CAP 61.02) –regulates the search and production of petroleum, provides for protection of the environment, exploration, licensing.
- Explosives Act (CAP 14.09) – regulation control etc.
- Fertilizers, Farm Feeds and Remedies Act (CAP 67.04) – registration of fertilizers farm seeds, etc.

3.2.5 Industrial Infrastructure and Urban Development

- Industrial Development Act (CAP 51.01) – controls the orderly development and promotion of industry.
- Factories Act (CAP 55.07) – regulation of employment conditions, health, welfare and safety in the work place.
- Electricity Act (CAP 73.01) – establishment of Electricity Supply Commission of Malawi (ESCOM) – gives power with respect to generation, supply and use of electricity relevant for clearing of land and transmission lines.

3.2.6 Other Acts

- Treaties And Convention Publications Act (CAP 16.02) – provision for international treaties.
- Monuments Act (ACT 29.01) – protection of places of distinctive natural beauty and of sites, buildings etc.
- Public Roads Act (CAP 69.02) – provide for matters relating to public roads, construction and maintenance including compensation for land taken under roads construction.
- Town and Country Planning Act (CAP 23.01) – town and country planning; development control, acquisition of land compensation and development land by.
- Public Health Act (CAP 34.01) – preservation of public health: prevention of infectious diseases, sanitation and housing, sewerage and drainage.
- Malawi Housing Corporation Act (CAP 32.02) – establishes the Malawi Housing Corporation.

3.3 Environmental Policy, Institutional and Legislative Framework in Zambia

The Zambia Environmental Management Agency (ZEMA) formally known as Environmental Council of Zambia (ECZ) under the guidance of the Environmental Management Act of 2011 provides the administrative procedures and the required frame work for sustainable development and management of proposed and existing projects. The Act repealed the Environmental Protection and Pollution Control Act (The Act) of 1990. The Act is supported by the legal supplement SI No.28 of 1997 which provides EIA guidelines.

ZEMA is under the Ministry of Land, Natural Resources and Environmental Protection (MLNREP) as of March 2012. The MLNREN is the key institution entrusted with the

formulation of tourism and environmental policies, pollution control and natural resource conservation. The MTENR carries out its mandate through its three departments; the Forest, Tourism and the Planning and Information Department. The MTENR oversees the operations of the ZEMA, the Zambia Forest Commission, operations of ZAWA and the National Heritage and Conservation Commission.

The Zambia Forest Commission is responsible for licensing of wood harvesting for commercial purposes, manages the reservation of new forest area, conducts forest inventory and mapping, manages plantation sites and prepares management working plans. The Commission undertakes research in basic silviculture, measurement, tree improvement, forest protection and various aspects of timber processing. It also has an extension service, which deals with community forestry programmes and public education.

The regulatory framework directly governing the development of construction projects are:

- Environmental Management Act (EMA) 2012 Chapter 204,
- The Public Roads Act 2002;
- Forest Act, Chapter 199;
- National Parks and Wildlife Act Chapter 201;
- Water Act Chapter 198;
- National Heritage Conservation Commission Act;
- The Land Act;
- Mines and Minerals Act Chapter 213;
- Roads and Traffic Control Act Chapter 464;
- Town and Country Planning Act Chapter 28;
- Local Government Act Chapter 281;
- Public Health Act Chapter 295;
- Factories Act Chapter,
- Petroleum Act Chapter 439 and
- The Energy Regulation Act Chapter 436
- The National HIV/AIDS/STI/TB Council Act of 2002
- The Arbitration Act No. 19 of 2000

Other supplementary regulations that govern such a project are:

- Statutory Instrument No. 28 of 1997 Environmental Protection and Pollution Control Act (Environmental Impact Assessment) Regulations, 1997: These Regulations provides the framework for conducting and reviewing Environmental Impact Assessment (EIA) for any project. Regulation 3 (1) of the EIA Regulations states that, a developer shall not implement a project for which a project brief or Environmental Impact Statement (EIS) is required, unless the project brief or EIS has been concluded in accordance with the requirements of the regulations and the Zambia Environmental Management Agency has issued a decision letter.
- Section 10 of the regulation requires the developer to seek the views of the community likely to be affected by the project. Section 10 (2a) requires the developer to publicise the intended project, its effects and benefits, in the mass media, in a language understood by the community, and thereafter hold meetings with the

affected communities to present. This need to be undertaken during the detailed impact assessment study for each riparian state.

- Section 28(2) of the regulation requires the project developer to conduct an environmental audit within a period of not less than 12 months or more than 36 months after the completion of a project or commencement of its operation whichever is earlier.
- Section 30 of the regulation gives three years as the validity period for the development authorization permit given by ZEMA. Section 36 of the regulations informs the developers that the council charges a fee for the operational costs of reviewing the EIA as prescribed under the fifth schedule.
- Waste Management Regulations (SI No. 71 of 1993): These Regulations sets out the licensing requirements for transporters and waste disposal sites and provides definitions of waste. In application for a license to transport waste, the waste transporter should provide in the application form WM1 found in the First Schedule of the regulation the following information; number and type of vehicles to transport wastes, facilities and equipment available on vehicles to transport the waste, type of waste to be transported, quantity of wastes per vehicle to be transported, quantity of wastes to be dispersed in tones/kg per annum and, the sources of waste, license of sites/plants to which wastes are to be transported, collection schedule, and collection frequency.
- The demolition works and construction activities to be associated with resettlement will mainly generate construction, excavated waste and domestic waste by the project labourers. All generated waste should be disposed according to regulation of the local authority in the project area and excavated material can be used to backfill quarry sites and burrow pits from which project material shall be sourced.
- Water Pollution Control (Effluent and Waste Water) Regulations (SI No. 72 of 1993): These Regulations prohibit unauthorized discharge of pollutants into the aquatic environment and require that, a license be obtained before discharging effluent into the environment. The Third Schedule of the regulation states the standards of effluent to be discharged into the environment. Currently waste water generated by those settled along the lake is directly discharged into the lake either through disposal or seepage of pit latrines as the settled area within the riparian zone have no centralised sewage network and the community members use on-site methods to handle sewage. Measures need to be taken to relocate the settlers from the riparian so as to reduce pollution and thus improve the lakes ecosystem.
- Air Pollution Control (Licensing and Emissions Standards) Regulations (SI No. 141 of 1996): These Regulations provides guidelines for the control of emissions to the environment and specifies the statutory discharge limits for respective parameters. The regulation requires any operator of a facility undertaking activities that generate air pollutants to acquire a license. The regulation (15) also prohibits open burning of wastes except with written consent from the Environmental Inspectorate.
- The main air pollutant of concern in the project could be dust from excavation activities, use of project vehicles, off-loading of gravel and dust. These dust

associated impacts can be controlled through water palliation of dry surfaces and provision of Protective Professional Equipments and Clothings (PPE&C) to project workers. Waste management through burning (if necessary) will be undertaken under the guidance of the local authority and the Environmental Inspectorate.

- Environmental Protection and Pollution Control Act (Ozone Depletion Substances) Regulations 2000: These regulations provides guideline that control the importation, exportation, production, distribution or handling of controlled substance in Zambia. The regulation prohibits the use, sale, distribution, importation, exportation or dealing in any manner with controlled substance listed in under column I of the Second Schedule of the regulation. The regulation prohibits importation or exportation of air conditioners, refrigerators or other product containing or designed to use any controlled substance (8). Cooling systems including those of vehicles should be fitted with CFC free coolant (9) and substances like aerosol products should not use Chlorofluorocarbon as a gas or a propellant (10 (1)). Section 13. (1) prohibits use of fire extinguishers containing halogen. It is recommended that any products likely to contain ODS should only be procured for the proposed project after passing the various Government inspectorate units tests which should include the Environmental Inspectorate unit requirements and if need arises relevant permits should be applied for.
- Hazardous Waste Management Regulations (S.I. No. 125 of 2001): These Regulations provides for the control of generation, collection, storage, transportation, pre-treatment, treatment, disposal, export, import and trans-boundary movement of hazardous waste as listed in Fourth Schedule or any waste specified in Sixth Schedule, if that waste exhibits characteristics found in the Fifth Schedule to the Regulations.
- Therefore generation, collection storage, transportation, pre-treatment and disposal of hazardous wastes may require to be licensed under these Regulations. The project shall enhance trade between the riparian states thus the water way should not be negatively exploited to transport hazardous waste.
- The Pesticides and Toxic Substance Regulation, 1994 (S.I. No. 20 of 1994): This regulation requires those intending to manufacture, import, and export, improve, or process new pesticide, or toxic substance to apply for registration at the Inspectorate. The proposed project will not deal with pesticides but substances considered toxic such as petrol, bitumen will be stored at the construction site. It is therefore recommended that the storage of the substance be undertaken according to the regulation governing them and this should include using appropriate signage and appropriate transportation containers so as to prevent environmental damage and impact to human health.

3.4 Environmental Policy, Institutional and Legislative Framework in Mozambique

The Environmental Impact Assessment regulations requires that all projects subject to environmental licensing shall be submitted to the local authorities of the implementation area. Projects falling under “A” Category shall require the authorization of the National Direction for Environmental Impact Assessment.

The Regulation is composed of 28 articles and three annexes divided in five Chapters. It applies to those public and private activities that may directly or indirectly, affect the environment. The Regulation provides a classification of the activities subject to EIA and the related specific requirements. Moreover, it identifies the exemptions and the competent authorities. Particular attention is paid to the detailed regulation of the assessment process and the EIA main components and assessment criteria. It also regulates environmental licensing procedures and creates a registry for environmental consultants. Finally, it rules on applicable sanctions and penalties.

3.4.1 Regulation on residue management

This Decree approves the Regulation on residues management. The Regulation, consists of 4 Chapters and 9 Annexes and it aims at establishing general rules related to residue disposal, including: production, storage in the ground and under the soil, residues disposal into water discharges or in the atmosphere, treatment, collection, storage and transport of any residue, with exception of those of radioactive nature or subject to specific regulation, in order to prevent or minimize its negative impacts on human health and the environment. It also establishes categories of residues, management of residues and prescribes sanctions to be paid by illegal activity. It is divided as follows: General provisions (Chap. I); Non-hazardous residues management (Chap. II); Hazardous residue management (Chap. III); Final provisions (Chap. IV). Annexes list all residue category, classification and related authorized activities.

4. Project Impacts Identification and Mitigation Measures

The consultant superimposed the proposed project design alternatives on the proposed project sites and at the same time evaluated the activities that shall be related to the project during the construction and operation phase to enable identify the likely project impacts and thus develop mitigation measures. The main sensitive environmental parameter at the project site was human settlement as discussed in the baseline survey thus there is need to plan the project siting appropriately. In addition the project should mitigate against environmental impacts that are likely to cause air pollution, soil pollution, and impact to the population health, expose people to risks and hazards among other impacts that shall emanate from the project activities.

The section below discusses the main site specific impacts that are likely to occur at the proposed project sites.

4.1 Site specific identified potential impacts for Mchinji-Mwami border post

The main impacts that are likely to occur at this project site are:

- Increased water demand due to construction needs and anticipated increased number of border post users which might affect the water needs of the surrounding communities. Water is already a problem in the area and thus there will be need to ensure the supply to the BP is consistent and adequate to cater for the BP staff and any new developments that will be attracted to the area;
- Soil erosion: Soil material excavated to pave way for construction should be cleared immediately to avoid it from being washed away which will cause dust pollution, possible erosion to neighbouring land and settlements resulting in aesthetic and soil condition degradation. In the rainy season if the soil is left it shall be washed into the closest river to the border post which is located 7km away. This impact shall affect the water quality of the river by increasing turbidity, reducing water oxygen levels, leading to poor public health and damage of the river ecosystem;
- Land acquisition: There is no land assigned for expansion on the Mwami side of the border and this will require land acquisition from the area Chief as the land in the area is customary. There is also need to control further development towards the BP so as to avoid need of resettling the people in future. Currently the land around Mwami BP is developing into an active trading centre and if not controlled or planned well, the development will come closer to existing BP hence making further expansion difficult. The Mchinji side had set aside 10 acres for development of staff quarters which might not be adequate to cater for the new expansion. There is therefore need to acquire more land.
- Relocation and resettlement of locals after land acquisition.

4.2 The main mitigation measures for impacts at Mchinji-Mwami border post

- Involve the District Council as stakeholders in the project planning so that they work towards improving services delivery in the area especially in regards to water and sanitation ;
- Ensure implementation of mitigation against degradation of the environment, it is recommended that the developer keeps the site clean and ensure environmental management and mending up programmes which should encompass clearing of excavated materials, clearing of solid waste, waste water, spilled oil among other refuse generated at the site.

4.3 Site specific identified potential impacts for Chiponde-Mandimba border post

The main impacts that is likely to occur at the project is land acquisition

4.4 The main mitigation measures for impacts at Chiponde-Mandimba border post

The main mitigation measures for the mentioned impacts;

- There will be need to develop a compensation framework for those who shall be affected by the project. The framework shall include the names and number of those affected, their affected properties, the value of affected properties, resettlement options among others. All the above-mentioned resettlement factors have been taken into consideration while estimating the compensation costs under section 6.8 of this chapter.

4.5 General Construction and Border Post Related Impacts

In addition to the above-mentioned site specific impacts, the section below identifies general impacts associated with a project of this nature. The section discusses both the anticipated negative and positive impacts at the construction and operation phases and proposes mitigation measures for each phase.

4.5.1 Negative Environmental Impacts of Construction Activities

- **Air Quality:** The air quality of the project area can be affected by several emissions sources and the types of anticipated emissions include dust, exhaust fumes and, noise which if not controlled will affect human and animal health; exhaust emissions (Oxides of Sulphur (SO_x), Oxides of Nitrogen (NO_x), Carbon dioxide (CO₂), Carbon Monoxide (CO), Ozone (O₃)) from vehicles and equipments that shall be used during project design and operation phases shall impact negatively on climate change, human health, food security;
- **Occupational Health and Safety:** Project workers and the general community shall be exposed to risks and hazards associated with the project activities;
- **Clearance of Vegetation:** This will occur if vegetation such as trees shall be cleared to pave way for the construction or its related activities.

- Increased Soil Erosion and Siltation of rivers-Soil erosion from excavation works especially during rainy season or when working in wet conditions will lead to washing of loose soils into the rivers near the project sites.
- Water Quality-The use of pit latrines as a form of onsite sanitation shall lead to underground water fertilization which affects water quality.
- Solid Waste Generation and Management: Currently the border posts are facing challenges handling of their generated waste. This challenge is likely to worsen due to anticipated increase in waste generation from project activities and its workers at their domestic/individual levels.
- There will be increased energy demand in form of fossil and, wood fuel for project activities and its workers domestic needs thus lead to increased deforestation.
- Increased water demand:-the need of construction water will lead to increase water demand thus affect the residents depending on the same source especially considering that water supply is limited in the area.
- Increased need of sanitary facilities at project site:-the construction workers and visitors to the area will need sanitation facilities which are limited in the area especially for public use.
- Interference with social-cultural set up of the area:- This shall occur in case immigrant labourers/workers working at the site introduce new practices in the area that the community members are not accustomed with including social vices such as increased alcoholism, sexually transmitted disease, interference with family set-up etc. These vices might increase if community members are empowered and not advised on resource management which shall lead to increased incidences of HIV/AIDS.
- Increased traffic due to ferrying of project materials
- Collection of socio-economic data leads to suspicion due to the personal questions asked by the enumerators making some respondents give false information. To some extent the social surveys lead to interference with communities daily activities

4.5.2 Positive Environmental Impacts of Construction Activities

- Creation of employment opportunities thus lead to poverty alleviation
- Provision of market to suppliers of construction materials and development of other secondary markets
- Increased business opportunities for community members thus reduction in poverty levels and increase in purchasing power.
- Increase in inter-cultural communication and increased socialism due to professionals and workers from different areas working for the project.
- Increased revenue to the Government through tax and duty payment
- Increased visitation to the area

4.5.3 Negative Environmental Impacts of Operational Activities

- Increase water and sanitation demand:- It is anticipated that the need for sanitation will increase due to increase in the number of staff and people plying the route
- Solid Waste Generation:-Generated solid waste is also likely to increase which shall include e-waste in form of broken down computers.
- Increased energy demand:-Since the operation activities of the OSBP shall be purely electronic and shall be working round the clock (24 hours), the need for energy shall increase not only in actual consumption but also in terms of operation costs.

4.5.4 Positive Environmental Impacts of Operational Activities

- Increased security especially at the porous Chiponde-Mandimba BP
- Enhanced efficiency thus reduce time wastage due to faster clearance of travelers, vehicles and goods
- Creation of employment
- Increase in communication between neighbouring countries which can enhance inter-relations and economic prosperity
- Attraction of development to the project area for example opening up of industries, financial and education institutions, increase in ICT use among others
- Increased revenue to National and Local Governments through payment of taxes for purchased goods and services
- Landscaping of the OSBP compounds and other environmental programmes shall improve the aesthetic value and micro-climate of the area.

4.5.5 Negative Environmental Impacts of Decommissioning Activities

- Lack of security and services at the border post
- Increased Solid Waste
- Dust emission
- Noise and Vibration
- Lack of sanitation facility to handle sewage which can lead to increase incidences of diseases

4.5.6 Positive Environmental Impacts of Decommissioning Activities

- Rehabilitation of ecosystem
- Employment Opportunities

4.6 Mitigation measures

The proposed project's should focus on reducing the negative impacts and maximizing the positive impacts associated with its activities through a program of continuous conservation, management and improvement. The proposed mitigation measures that shall guide in attaining environmental and social sustainability are:

4.6.1 Socio-Economic Mitigation

- Work in collaboration with relevant government representative in the project area including Roads Officers and Local Authorities to ensure the proposed project is in tandem with the development plans of the area;
- Give the locals priority in terms of job allocations especially for activities requiring non-skilled labour; where possible offer women equal employment opportunities as men;
- Conduct workshops and surveys at community level to facilitate impact monitoring on the environment, socio-economic and socio-cultural aspects;
- Enhance security in project area through community policing in collaboration with local community members;
- Develop Information Education and Communication (IEC) programmes on the projects social impacts and train community members on conduction of awareness and training programmes with the help of the project team in fields such as HIV/AIDs and other public health issues; and
- Develop programmes to enhance cohesion between project employees and the local communities for example development of sports activities.
- Establish labour camps at reasonable distance from villages to help control propagation of social vices;

4.6.2 Environment, Health and Safety Mitigation

- Employ trained and certified personnel to install, maintain and repair project installations;
- Employ trained and qualified machine handlers and drivers to ensure adherence to safety standards;
- Develop EHS programmes and provide workers with Protective Professional Clothing and Equipments (PPE&C);
- Provide appropriate signage during development;
- Complying with work place legal requirements including provision of insurance cover to project workers, provide them clean drinking water and sanitation facilities;
- Instituting safety drills, disaster preparedness and management programmes; and
- Provided sanitary facilities to project workers inform of solid waste disposal facilities and mobile toilets

4.6.3 Bio-Physical Mitigation Measures

4.6.3.1. Vegetation and Soils

- Control soil erosion through timely clearing of excavations from project area; development of erosion control structure and excavate new areas only after finishing work at opened segments among other measures;
- Develop afforestation programmes in collaboration with the community members during and after project implementation by planting trees through promotion and development of community nurseries; educate on need of planting trees including its positive effects to counteract global warming and its role on ensuring trade sustainability especially for those dealing with timber and its products;
- Develop Solid Water Management Programmes through use of integrated solid waste management system of source reduction, recycling, reuse; purchase required quantities of materials to a void waste through elements of weather; excavated materials to be disposed at recommended sites; compost biological waste to be used as fertilizer among others; and
- Avoid spilling over project activities and effects to forest reserve at Mchinji-Mwami border. This will include project workers to avoid dumping waste in the forest, avoid involving tree logging, introduction of new plant species and harvesting of rare plant species among others issues.

4.6.3.2 Air Quality and Aquatic Environment

- Use clean fuels or catalytic convertors for project vehicles and equipments dependent on fossil fuels; The internal combustion engines of the vehicles and equipment should have efficient burning systems to reduce emissions;
- Incorporate green technology in the development of the building this shall include incorporating the use of solar energy, wind energy, day light by using more transparent project materials such as glass, acoustics to reduce noise penetration into buildings among others. This shall help reduce amount of energy required to run the facilities.
- Use machines with noise and air quality techniques to abate project impacts on air quality. This shall include use engine's with silencers, or insulate noise generating sections of the machines during construction, maintain machines and equipments as per recommended manufactures conditions to avoid noise and emissions, use machines installed with options to use clean fuels such a bio-fuels. In addition ensure drivers use appropriate driving techniques such as observation of speed limits and time based traffic management for construction work to help reduce noise and air pollution. Create awareness among drivers and machine operators on practices aimed at reducing emissions
- Avoid the use of Ozone Depleting Substances (ODS) such as halogenated compounds chlorofluorocarbons (CFCs), hydro chlorofluorocarbons (HCFCs), methyl bromide, carbon tetrachloride, and methyl chloroform found in cooling system in the vehicles and, refrigerators, fire extinguishers and other machines and equipments in the project. Depletion of ozone leads to health impacts such as skin cancer.
- Observe legal restriction in regards to level of noise, vibration and emissions exposures allowed at a specific period. In absence of local regulation the World Health Organisation (WHO) standards as found under annex 3 of this ESIA report can be adopted

- Create awareness among drivers and machine operators on practices aimed at reducing emissions;
- There is need to construct containerized sewage handling facilities such as septic tanks to reduce impact on water quality which should incorporate effluent treatment with reuse of end products locally this shall involve recycling of water and using it for flushing toilets and irrigating the lawns/landscaped gardens among other .
- Develop roof catchment rain water harvesting facilities to generate water for use during shortage this shall limit impact of water abstraction from the natural resources.
- Water palliation should be undertaken at excavated areas to control dust especially in areas of high human movement or settlement;
- Observe manufacturer machinery and, equipment guidelines and procedures with regard to noise as well as oil spill prevention and emergency response;
- Undertake monitoring of impacts during operation phase which should include air quality impacts to enable develop appropriate mitigation measures such as noise buffers/barriers on the highway.
- To mitigate against climate change the project life cycle analysis and carbon foot prints of each project activity including the Global Warming Potential (GWP) of the gas which is based on the heat-absorbing ability of each gas relative to that of carbon dioxide GHG equivalents should be calculated and appropriate climate change adaptation designed for the project.
- Observe manufacturer machinery and, equipment guidelines and procedures with regard to noise as well as oil spill prevention and emergency response; and
- Implement bio safety regulation, hazardous movement regulations among other international policies, conventions and treaties ratified by the countries to restrict movement of environmental unsafe substances

4.6.4 Decommissioning Mitigation

In addition to the mitigation measures provided above, it is necessary to outline some basic mitigation measures that will require consideration once all project operational activities ceases. The necessary objectives, mitigation measures, allocation of responsibilities, time frames and costs pertaining to prevention, minimization and monitoring of all potential impacts associated with the decommissioning and closure phase of the project are outlined in table **4.6.4** below

Table 4.6.4 Environmental Management/Monitoring Plan for the Decommissioning Phase for the Proposed Project

Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (USD)
1. Demolition waste management			
1. All machinery, equipment, and structures must be removed and recycled/reused as far as possible	Contractor, Proponent	One-off	–
2. All foundations should be removed and recycled, reused or disposed of at a licensed disposal site			
3. Where recycling/reuse of the machinery, equipment, implements, structures and other demolition waste is not possible, the materials should taken to a licensed waste disposal site	Contractor, Proponent	One-off	–
4. Donate reusable demolition waste to charitable organizations, individuals and institutions	Contractor, Proponent	One-off	–
2 .River Rehabilitation			
1. Ensure no waste in dumped haphazardly	Proponent/ Contractor	One-off	–
2. In case of pollution ensure due cleanup process in followed	Farmers/DAO	One-off	–
3. Occupational Health and Safety			
1. Provide all project workers with PPE&C	Contractor, Proponent	One-off	–
2. Ensure all live components of the project are deactivated before commencing decommissioning activities	Contractor, Proponent	One-off	–
3. Control exposure to EMF	Contractor, Proponent	One-off	–
4. Rehabilitation of project site			
1. Implement an appropriate re-vegetation program to restore the site to its original status	Contractor, Proponent	One-off	–
2. Consider use of indigenous plant species in re-vegetation	Contractor, Proponent	One-off	–

The consultants have developed an Environmental Management and Monitoring Plan (EM&MP) which is provided in the annex 4 of this report. The objective of the EM&MP is to guide the project team in eliminating or reducing the project impacts to acceptable minimum/standards. The EM&MP is based on good environmental practices of project implementation and management including safety of the operations. The proposed EM&MP can be improved through continuous monitoring and audits during project implementation.

4.7 Monitoring Guidelines

Continuous observations and assessment is essential for identification of impacts unforeseen during the E&SIA of the project. To ensure success of the project adequate consultation should be undertaken in the project area with the community members as the project proceeds.

Monitoring parameters/indicators should be identified and programmes developed for their observation and action. When developing a monitoring programme the following should be considered:

- Frequency of monitoring
- Required personnel -Monitoring should be conducted by trained personnel
- Methods of record keeping
- Availability of calibrated and maintain parameters measuring equipments
- Existence of baseline information
- Data analysis and review

The environmental indicators to be monitored during the project phases namely the construction, operation and decommissioning include those listed in the table below. The monitoring parameters can be revised as the project development precedes to enable incorporate and unforeseen indicators.

Table 4.7 : List of the Environmental Parameters and their Measurable Indicators

Environmental Indicator	Parameter to Monitor
Occupational Health and Safety	- Number of occupational diseases and accidents
Socio-Economic Environment	-Development Projects -Poverty levels -Number of idle community members -Alcoholism -Public complaints -Trend of infectious diseases for example: HIV/AIDS, STI's -Correlation between project team and local community
Air Quality	-Noise -Exhaust fumes -Vibration - Dust -Smoke
Aquatic Environment Alteration	-Water borne disease -Farming methods in the area -Turbidity -Waste -Existence of vegetation -Water quality and quantity/Eutrophication -Complaint from community members
Vegetation Cover	-Invasive vegetation

Environmental Indicator	Parameter to Monitor
	-Vegetation rate of growth
Waste Management	-Existence of solid waste -Water Quality -Water Borne Diseases -Complaint from community members
Soil Erosion	-Hill side farming with erosion protection structures -Gulley formation -Increased sediments -Complaint from community members
Pest and Diseases	-Productivity -Mortality rate of animals -Agrochemicals

The list of the environmental parameters and their measurable indicators will guide the proponent access the effective level of the EMP and need to modify it for appropriate action.

5 Project Alternatives and Cost Benefit Analysis

The design and siting alternatives for the proposed project has already be dicussed in earlier sections of this report and it has shown that the juxtapost design is prefered by each country accroding to consultation with the staff at the existitng BP. There preferenace was based on factors which the consultant took into consideration when evaluating the several criteria likely to affect the choise which included cost-benefit analysis. The development any type of border post will require land acqusition and planning of the area to eanble accomodate all project facilities especially at Mawmi-Mchinji which is surrounded by dense settlement right at the boundary of both countries. The Chiponde-Mandimba BP will not face as much challenge even if relocated as the land earmaked for development near the demartketed boundary has no settlments as it is only used for farming. The development plan requires each country to contribute 5 hectares for the development.

Alternatives considered in terms of technology involved evaluating construction tools in terms of its source of energy, green architectural technology and concepts such as incorporating light saving design components, solar/wind energy, waste water recycling, solid waste management technology among others. In this case to ensure the project meets environmental and social sustainability requirements, it is proposed that the project be majorly labour based so as to create employment in the local area especially considering the local communities within the project area have a very high poverty index. In case of machine use it should use clean fuels to avoid increasing impacting on climate change. Building acoustics and lighting components which should be designed to ensure it meets the requirements of green architectural technology.

Alternatives of solid waste management should be based on the waste management hierarchy of rethink, reduce, reuse and recycle this shall considerably reduce the amount of waste generated at the project site.

It is recommended that building materials be sourced at the nearest point from the project site as it shall make both economic and environmental sense as this strategy shall reduce transport costs and emissions know to increase impacts of climate change.

It is important that all key players are involved in environmental management during construction this shall include incorporating environmental management practices as part of the contactors contract.

6. Summary and Conclusion

The bio-physical and socio-economic surveys of the border posts indicate that each of the project sites zone of impact is not found within areas with sensitive natural environmental resources but is found within a sensitive socio-economic zone as the areas are densely settled. In regards to natural environmental resources, mitigation measures should be implemented to avoid spillover effects as pollutants can travel long distance to reach environmental receptors such as forests, rivers and underground water. While in regards to human settlement there is need to implement the land acquisition guidelines so as to ensure all affected people are resettled as required by law. The project's mitigation measures can also be improved with time through environmental monitoring which can help identify other sensitive environmental parameters not identified during the study. It is important that the mitigation measures proposed in the report form part of the contractor's contract and pegged on payments to ensure the prospective contractors implement them.

The socio-economic survey component of the Three One Stop Border Post Project established the perception on the existence of the border post and the proposed development of the One Stop Border Post, the Sanitation situation on the border posts, Social Amenities within the border post and HIV/AIDS awareness and mitigation in the sample area. The study shows that services at the current border posts are far from meeting the expectations of its users. Clearance processes are considered tedious and cumbersome by most users at the border post as revealed in the survey. The idea of the One Stop Border Post with enhanced security system, enhanced ICT facilities, trained and, qualified staff and improved infrastructure were acknowledged by majority as the lasting solution and to some point the proposed project was considered long overdue.

Sanitation services at the current border posts are wanting, the survey revealed that the border posts lacked designated solid waste disposal points, public toilet and public taps hence suggesting that these services and facilities be incorporated in the proposed One Stop Border Post project.

Available accommodation facilities do not fulfill the supply and demand rule, they are scarce, poorly distributed, expensive and some lacked basic facilities. The survey hints that these

facilities should be upgraded in order to meet the set bench mark that will ensure affordability and accessibility.

In spite of HIV / AIDS awareness, lesser precautions are taken to curb the deadly disease. The survey suggests that awareness campaign has to take a different approach. The community has to be involved fully in the war against this menace, organizations involved in HIV / AIDS activities must work hand in hand with the community in order to achieve their goals. Mobile Voluntary Counseling and Testing facilities should be intensified this will facilitate frequent conduct of door to door campaign on testing and counseling which is considered flexible for maximum achievement. Others include; frequent use of factual films and play centered on HIV / AIDS at designated parking and market areas in order to reach a wider audience including long distance travelers.

The One Stop Border Post project is anticipated with high expectations by majority of persons in the sample area. It is believed by many that the project will boost business, improve the living standards, create job opportunities, foster developments, and enhance the security system among others. The survey therefore confirmed that the project acceptability by the communities surrounding the sites.