GOVERNMENT OF SOMALILAND

MINISTRY OF TRANSPORT AND ROADS DEVELOPMENT AGENCY

Consultancy services for the feasibility study preliminary and detailed engineering design, Environmental and social Impact Assessment (ESIA) and preparation of Tender documents for upgrading of

Lowyaddo–Farddaha–Borama Road (256km)

Ref No.: S/L/RDA/LFBR/SVS/2019-10/002

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (FINAL)

July 2022

ES ISO 9001:2008

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SABA ENGINEERING PRIVATE LIMITED COMPANY

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Acronyms and Abbreviations

ADB	African Development Bank
SE	SABA Engineering
CBO	Community Based Organization
CBD	Convention on Biological Diversity
CPA	Comprehensive Peace Agreement
EHS	Environmental Health Safety
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESAP	Environmental and Social Action Plan
ESMP	Environmental and Social Management Plan
FGD	Focus group discussions
GoSL	Government of Somaliland
MoAL	Ministry of Agriculture and Livestock Development
MoH	Ministry of Health
MoLPSHRM	Ministry of Labor, Public Service and Human Resources Management
NGO	Non-Governmental Organization
PPP	Polluter pays Principle
SLRA	Somaliland Roads Authority
RAP	Resettlement Action Plan

SLDP	Somaliland Development Plan
TA	Traditional Authority
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank

EXECUTIVE SUMMARY

The Somaliland Roads Authority acting as a duly representative of the Ministry of Transport and Road Development of the Government of the Republic of Somaliland in the road sector decided to construct the Lowyaddo-Farddaha-Borama Road Project.

Pertinent to the above concept the Government of the Republic of Somaliland, represented by the Somaliland Roads Authority, an implementing agency of the Transport and Road Development, has been allocated grant funds from the African Development Fund towards Feasibility studies, Environmental and Social Impact Assessment, Resettlement Action Plan(RAP), Detailed Engineering Design, Cost Estimates and Preparation of Bidding Documents for Upgrading to Paved (Bitumen) Standard of Lowyaddo-Farddaha-Borama Road Project.

The above mentioned project will be part of Borama-Hargeissa corridor. The road will solve the prevailing nationwide transportation cost, transportation efficiency and serve as strategic link between Somaliland, Ethiopia and Djibouti.

The project road Lowyaddo-Farddaha-Borama road starts at Lowyaddo town, which is located in Eastern part of the Awdal region. The start point of the project is around 256km North East of Borama.

The proposed Lowyaddo-Farddaha-Borama road project traverses all the villages and towns within the Bon district which belongs to the previous Regional Hierarchy known as Awdal Region. The project route corridor totally lies in the previous Awdal region; it borders Ethiopia in the North West and South West, and Djibouti and the Gulf of Aden in the North. Currently, there are District Administrations in the region. In recent days there are two Regions transacted by the project road namely the Awdal Region and Salal Region. The Salal region encompasses the areas from Lowy ado, Zeyila up to Garisa, whereas areas next to Garisa up to Borama belong to Awdal Region.

The Towns and villages from start to the end faced along the corridor include: Lowyaddo, Tokosh, Zeyila, Ashado, Ealgal, Garisa, Hogferes, Farddaha, Areworen, Ferdihun, Hungry, Werar, Degahamedo, Halemale, Wunad, Bon, Quljet, Jirjir, Fulaful and Borama.

The Road Development Authority believes that infrastructure development and environmental protection should go hand in hand. ESIA is understood as an integrated part of the planning and construction process devoted to characterize socio-environmental impacts due to the realization of a project. It also seeks to define policies and strategies required to monitor and control such impacts. Hence, in order to understand the impact of the proposed road project on various socio-environmental factors and to propose appropriate measures to overcome adverse impacts, ESIA is taken as part of the Lowyaddo-Farddaha-Borama road project.

i. Introduction and Background

Roads facilitate the movement of people and goods, establishing a direct linkage between two places (travel points), origin and destination, with a single mode and with varied means. Motorized road transport has thus become an integral element of modern life, contributing to economic development and enhancing the quality of life. The demand for roads within Somaliland has increased tremendously as the mobility of urban, suburban and regional commuters has increased, as has the transport of assorted agricultural produce, industrial raw materials and finished products. The demand has further increased since road transport has become the means of personalized transport. The remarkable economic growth achieved in the last few years by most developing countries in the Horn of Africa and the East African region has put a daunting pressure on infrastructure development, of which roads are the starting point. Consequently, the construction, expansion and upgrading of the national road (Lowyaddo-Farddaha-Borama in Somaliland) network was already a major aspect of the economic development program in Somaliland in and in the Horn of Africa countries.

The Lowyaddo-Farddaha-Borama Project road is located in the Awdal region; it borders Ethiopia in the North West and South West, and Djibouti and the Gulf of Aden in the North. The project road starts at Lowyaddo town (270km North East of Hargeissa the capital of SL), which is geographically located at 309957 N and 1267423E and transverse villages and towns until it reaches the end terminal of the project road (Borama) via Farddaha. There are also different features that are traversed by the project road, include the coastal and mountainous zones are indeed economically important with potential in fisheries, agriculture, mining and tourism sectors as well as plenty of underground water. The total length of the

road project is 256 kms. During the reconnaissance survey, the consultant has found four alternatives routes and recommended the best alternative which has been exposed to this ESIA. The do nothing option was sought but it has been recommended as the project will have immense potential for economic development without affecting the physical, biological and social environment adversely. The alternatives were analysed, compared as is reported on Chapter 6 and the most feasible route was selected which was exposed to this ESIA.

According to the ADB's Environmental and Social Impact Assessment (ESIA), the project is classified as Category 1 which calls for a full ESIA (Environmental and Social Impact Assessment) to be carried out.

ii. ESIA objectives

The fundamental objective of this ESIA is to ensure that upgrading of the project is environmentally sound and contributes to the development. This report provides information on major environmental issues which needs due consideration during construction and operation stages of the project. It is also expected to provide a means whereby the overall environmental performance can be enhanced through.

- Identification and evaluation of the potential impacts associated with the project implementation and operation
- Preparation of plans and recommendations regarding measures that would minimize the adverse impacts and enhance the beneficial impacts.

iii. Summary of the existing Environment to be impacted by the road project

Information on existing natural and socio-economic resources is of fundamental importance for evolution of environmental impacts. The baseline data on the current status of the physical, biological and socio-cultural and economic environments of the project area have been assembled, evaluated and presented.

iii.a. Physiographic Setting

Lowyaddo-Farddaha-Borama road upgrading project is located on the South East part of the Republic of Somaliland. The starting and ending point of the road are Lowyaiddo and Borama respectively. From start to end, the project road crosses major towns and villages. The geographic coordinates is start and end point of the project road are Easting 310329 Northing 1267105 and Easting 300621 and Northing 1099047 respectively, the elevation of starting point is about 4 m above sea level, while that of end of the project is about 1450 m above sea level with 1585 m.a.s.l. around Quljet town (maximum elevation) and 2 ma.s.l at Zeyila (lowest point). The proposed project centerline passes through flat, rolling terrain and mountainous terrain.

iii.b. Population

The Somaliland population was estimated at 3.6 million in 2014 and was projected to hit 4.2 million in 2020 at an annual growth rate of 2.93%, with bulk of the population living in urban centres. Somaliland has a young population with 37.8% of the population being less than 15 years old, and roughly 72% of the population being under 30 years (SLHDS, 2020). This population growth is an indicator of increased future demand for transport services within the project road corridor.

iii.c. Climate

The project road is located in the Awdal and Salel regions which are characterised by a range of plateaus, mountains and coastal plains, thereby, making the climate to be dependent on topographic features.

The average temperature in the project area, of which 65% is made up of plateaus and mountainous zones, ranges from 25 to 35°C. The coastal zone, on the other hand, is characterised with high temperatures and low rainfall with summer temperatures averaging over 38°C and hitting up to 45°C during the hottest days. Winter is, however, characterised with low temperatures.

The climatic condition of the project area generally lies in semi-arid and arid climatic zones. The plateau and mountainous zones may be described as being semi-arid with an average annual rainfall of 446 mm, while the coastal zones may be described as being arid regions as they receive less precipitation.

The major, rainy season (late March, April, May, and early June) experiences the heaviest rainfall in the plateau and the coastal range gets rain while the plateau and the mountainous area are in dry condition. This constitutes the period of fresh grazing and abundant surface water.

iii.d. Geology

The study area is covered by rocks dating from Pre-Cambrian to Recent, comprising of sedimentary, igneous and metamorphic rocks. The tectonic arrangement of rock outcrops in the region is complex and severely affected by many different systems of faults and fractures, mainly oriented parallel to the coast.

Most sedimentary rocks are limestones and sandstones, igneous rocks consist mostly of basalts and rhyolites, and metamorphic rocks show a range of different rocks such as marbles, gneiss. Along the coast some sands and quaternary alluvial deposits form the greater part of the outcropping lithologies.

The basement complex covers an extensive area of the Al Mountains around Borama and Baki districts. In other parts of the region, it is covered by Jurassic limestone and miocene bio-limestone, pleistocene basalts and recent alluvial and aeolian deposits. Igneous rocks consist mostly of basalts and rhyolites, and metamorphic rocks include a wide range of schists, orthogneiss, quartzite, migmatites, marble, calcsilicate and paragneiss, intruded by granite, diorite and gabbro. Pleistocene basalt outcrops and other volcanic rock outcrops occur dispersed along the northern escarpment and coastal plain.

iii.e. Soil Type

Generally, the project alignment is located along hilly to mountainous terrain with stretches of rolling to flat topography predominantly covered by residual soil, alluvial deposit and highly weathered rock. The residual soils are the result of in-situ weathering of the Sandstone and basement rocks Phyllite rocks that make up geology of the area. These residual soils include sandy silty clay soil which are weathered product of sandstone and clay stone. Alluvial and colluvial deposits are soils which are deposited after

transportation by means of water and gravity respectively. Mostly alluvial and colluvial deposits in the project stretch are found in the valley and flat topography. Sand, silt and clay intermixed with gravel sized rock fragments are the dominant lithologies.

iii.f. Land use and Land Cover

The land use on the Bon town area is with occurrence of very diverse housing units, buildings, Fences and utilities include telephone and electric poles. However the ROW problem of Bon town is avoided due to the realignment of the line from the existing to new alignment within the town, as noted during the second consultation. Next to Bon the towns with ROW include Lowyaddo, Garisa and Borama as the alignment goes on the central gravity of those towns. However the ROW problems in the other small villages, is insignificant or in some cases almost none.

Widening will be accompanied with demolishment of various infrastructures to attain the width to town section level as per the standard. The impact on land use is dependent on the number and proximity to settlement. Therefore route impose higher impacts will be the one touching utilities, housing units and other properties as it runs on the existing route and dense settlement pattern.

On the rural section segment the occurrence of natural vegetation bushy vegetation, grass land and very sparse highland indigenous tree species also exist along the route. The impact on land use is dependent on the encroachment to new land where farm land, grazing land and other vegetation resources is available.

iii.g. Fauna and Flora

Owing to the extreme variations in climate and terrain, and comprising most ecological systems from altitude1450masl to 4masl, the route corridor possesses one of the largest and most diverse plant genetic and wildlife resources in the world.

In Somaliland, wildlife species live in diverse ecosystems, from the desert lowland coastal plain to the highest elevation of the project end, Borama. The Valley and the peripheral lowlands and mid altitudes of the country have also abundant wildlife and plant populations with huge sum of endemism.

Prevalent bush plants are Khansa, acacia, aloes, Boswellia and Commiphora which yields fragrant resins and balsams such as myrrh, frankincense

The proposed Lowyaddo-Farddaha-Borama Road Project will generally traverse through rarely occurring farm lands in the relatively high lands of Borama-Bon areas. There is also a limited number of irrigation area in the high land to mid land area of privately owned investors and small holders' farmers, settlements of various villages/towns and hence much vegetation and wildlife resources will be affected by those interventions. In the low land coastal plains the vegetation occurrence is very sparse in the saline plain but the hard grass, which is adaptable to saline environment occurrence is cosmopolitan.

Based on the information obtained during first hand interview to dwellers there are 5 National Parks in the Republic of Somaliland include Daallo Mountain, Hargeisa National Park, Hobyo grasslands and shrub lands, Jilib National Park, Kismayo National Park and Lag Badana National Park, however no parks, and priority forest areas along the proposed route corridor. Concerning wildlife sanctuaries (game reserve) there exists Zeyila partial reserve with a large number of wild lives occupying the harsh climatic condition of the project route areas. Therefore, the impact of the project on the vegetation and wildlife resources is expected to range from low to medium.

The Awdal including the project route corridor is said to be reach in wildlife resources. Among them, the most important one, which are rarer at other parts of Somaliland include Lion, Sudan cheetah, reticulated giraffe, hamadryads baboon, civet, Serval, African bush elephant, bush, ibex, kudu, dick-Dick, oribi, reedbuck, Somalia wild ass, gravy's zebra, Hyena,. According to local, there also a variety of vegetation, birds and wild animals in the region since most of the area, in relative terms, is still undisturbed.

iv. Environmental Impacts and Mitigation Measures

The potential benefits as well as potential adverse impacts of the proposed road project on physical, biological and socio-economic environments have been identified and appropriate benefit enhancement and/or mitigation measures have been recommended.

Both beneficiary and adverse socio-environmental impacts are anticipated from the road development project. The implementation of the project will create employment besides the contribution to the improvement of economic development of the Republic of Somaliland such import and export opportunities and facilities as it will be linked to the Ethiopia-Somaliland-Djibouti corridor. Many of the impacts will be short-term and reversible and stem from widening of road, encroachment on to completely untouched areas on the mountainous and coastal land plain section, ground disturbance due to earth works, operation of equipment's and camp site and residence yard and development of material sites.

The potential public health impacts from various disease vector species, at this point are considered a major factor affecting the implementation of the project. Pertinent to this, the other serious issue that should be given due attention is the social issues related to the influx of large labour force during implementation period. In particular, the spread of HIV-AIDS will increase unless strong control measures are taken. The control of malaria is also a prominent health problem if measures are not taken

v. Summary of Major Impacts

Table 1: The major impacts assessed and predicted in this ESIA

No.	*Impacts*	*Magnitude/direction*
1	*Impact on land ownership, access to business, residential area*	*Medium (-ve)*
2	*Impact on borrow pits, soil erosion at stream crossing, borrow pit and spoil sites and soil pollution.*	*High (-ve)*
3	*Impact of flora, fauna(birds, mammals and reptiles) and protected areas*	*Medium (-ve)*
4	*Impact of drainage and siltation(on the mountain range)*	*High(-ve)*
5	*Impact on sea water, existing water supply, sanitation and water*	*High (-Ve)*

	pollution.	
6	*Impact of air quality, wastes and aesthetics include: visual impact, road aesthetics, solid waste, particulates and noise, especially on settlement areas*	*High(-ve)*
7	*Infrastructure relocation(Electricity and Telecommunication poles)*	*Medium(-ve)*
8	*Impact on changes to socio-economic condition practices includes creation of employment, entrepreneurs' opportunities, and training.* *Overall socio-economic development of the Nation.*	*High (+ve)*
9	*Impact on changes to socio-economic condition practices in the project area includes Transport and site accident impacts, Noise, safety issues.*	*High (-ve)*
10	*Impact of Slope instability and land sliding*	*High (-ve)*

vi. Summary of Mitigation Measures

Mitigation has been recommended to minimize the above-named negative impacts while enhancing the positive ones. These are summarized as below

Table 2: Mitigation Measures

Impacts	*Mitigation Measures*
Impact on Land use, particularly on	*i. House Relocation and Compensation* *Somaliland Roads Authority to confirm the legal out spans of the road in consultation*

towns/villages	*with the residential/property owners.* *To ensure compensation of all property owners fully for loss of land with no gender bias after consultations and negotiations conducted in good faith by both parties (affected and proponent) before construction commences.* *Compensation will be effected prior to road construction.* *ii. Loss of Crops and Trees* *The market value of all crops and trees to be affected by the project will be assessed and compensated prior to commencement of construction activities.* *iii. Loss of Fencing and structures* *To ensure that all affected fences and houses are replaced* *iv. Loss of archeological/Cultural Resources* *To ensure that graves at homesteads are relocated prior to commencement of construction activities and the owners of the graves compensated accordingly* *To ensure that affected homesteads are allowed to carry out cultural practices such on their graves prior to commencement of construction activities.* *On findings of objects of scientific interest, that the works, engage the National Museum about the findings, who will in turn engage an archaeologist to remove the object of interest.* *v. Asphalt/Crusher Plants* *Location*

	Where applicable, the Contractor shall install the asphalt, concrete and crushing plants in flat land, cleared of organic top soil and with suitable access for vehicles. *The locations shall be approved by the Engineer, which shall not be near residential settlements and within/near the coastal land plain near Red Sea.* *The Contractor will ensure that installations of the plant shall provide adequate storage space for raw and surplus materials* *vi. Rock Blasting* *<u>Inspections</u>* - *Blasting operation could be limited to quarry/ borrow areas and in areas where improvement of grades and sharp curving is required on the mountainous range areas, in such cases.* - *No household must be within 500 m of active blasting sites. Should these be found to be within the blast zone, these must be inspected prior and after blasting, with photographs of homesteads taken by the contractor before blasting operations begins. The inspection will take place in the presence of the owner/resident 48 hours before and after the blast. In addition, the contractor shall, record each dwelling, structure and service within the zones of influence and record all details of the dwellings/structures/services including existing positions, lengths and widths of cracks, as well as the condition of doors, windows, roofing, wells, boreholes etc.* *<u>Compensation</u>* *-Blasting induced damage within the blasting zone will be compensated accordingly. The contractor, alone, shall be responsible for any costs that can be attributed to blasting activities, including the collection of fly-rock from adjacent lands and*

	fields.
Impact on access to business, schools, clinics and animal crossing	*vii. Access to business and social services* *To ensure that access roads leading to business/residential are kept open at all times for easier accessibility and that these provide safe and convenient passage.* *To ensure that all accesses are not blocked without providing alternatives and re-routing signs posted.* *To ensure that rocks, debris, dust or mud that will disturb traffic along all roads used by the project is removed as soon as practically possible.* *To create safe crossing points for pedestrians such as entrances to schools and other main crossings including construction of speed humps.*
Relocation of services (although mild	*viii. Water supply and sewer pipelines* *Water supply Service Office will be notified of the proponent's intention to construct a road in the vicinity of their water supply and sewer pipelines, and the need to relocate these pipelines for purposes of road construction.* *A relocation plan will be drawn up as to how the infrastructure is to be relocated with minimal disruption, and to determine how much the relocation exercise will cost the proponent.* *Markers will be put in place along the new pipeline routes for future identification.*
	ix. Electric Power lines *To notify Electric Corporation of the need to relocate power lines that*

	are in the road corridor. *A relocation plan will be drawn up by to how the infrastructure is to be relocated with minimal disruption, and to determine how much the relocation exercise will cost the proponent.* *Should the relocation involve underground cables, markers need to be put in place along the new power line route for future identification.* *x. Telephone Lines* *To notify Telecommunication Authority (TA) of the need to relocate the lines those are in the road corridor.* *A relocation plan will be drawn up by TA and the Contractor as to how the infrastructure is to be relocated with minimal disruption, and to determine how much the relocation exercise will cost the proponent.* *Should the relocation involve underground cables, markers need to be put in place along the* new line route for future identification.
Impact on Vegetation and Wild life	• Totally avoid locating quarry and/or borrow pits, camp sites and other workforce stations, development of water points within the Boma National Park area. • Avoid Horn and noise on wild life corridor • Educate/orient construction workforce that hunting is completely forbidden and illegal • The work force should not hunt animals for food and sport • To reduce night time disturbance from construction noise in the vegetated area, that is unavoidable, the practice of conducting construction activities should be limited between the hours of 2100 and 0600 in areas which are within 500 meters of the park area.

	• Equipment normally producing high levels of noise should be suppressed and screened when working within a distance of 200 meters from sensitive noise receptors/wild life habitats; • Installation of speed break and billboard every 1km. • Ranger posts at the start, middle and end of the road section through the park; they should be patrolling 24 hours/day. • Have speed checking equipment to monitor speeds - and fine drivers at either end; • Provide signage along the entire stretch-targeted at drivers, and also for tourists; • Prohibit open defecation along the route and provide sanitary facilities for the public at either end of the park - so that vehicles are not tempted to stop in the park area; • Rumble strips and a series of larger speed bumps where game trails and migration routes cross the road.

vii. Public Consultation

Formal meetings with the local officials and authorities and community leaders in Lowyaddo, Zeyila, Bon town, and Boroma town were consulted about the project and briefed about the project context. The major purpose of the consultation was to gauge the community feelings, know their opinions and gather information on socio-economic importance. The major outcomes are that, the local officials' and community representatives believe that construction of the proposed road will bring socio-economic improvement in the Regions where the project is located and in the country as a whole. The details of the outcome is minuted and attached on the annex section.

viii. Environmental Management Plan/Monitoring Plan

In the context of a project road, environmental management is concerned with implementation of measures necessary to minimize or offset adverse impacts and to enhance beneficial impacts. Therefore

it is recommended to fully integrate the environmental management and monitoring plan within the overall project management scheme, aimed at providing a high level control.

The monitoring program will indicate where changes to procedures or operations are required, in order to reduce impacts on the environment or local population. Environmental monitoring and management plans have also been proposed in the last sections of the report.

ix. Environmental Mitigation and management cost

In this report, the impacts are assessed and quantified. To overcome or minimize the identified adverse impacts and other possible negative impacts, appropriate mitigation measures for negative impacts are proposed in Section 9 of this report.

As far as the proposed mitigation measures are implemented properly, the overall project impact would be acceptable and positive impacts would overcome the adverse negative impacts. The overall environmental impact mitigations and compensation, management cost is estimated to be approximately **USD 1,610,400.**

x. Conclusion and Recommendation

The road project is technically and economically feasible. If the benefit enhancement and mitigation measures recommended in this Environmental Impact Statement are adopted, there is no environmental ground for not proceeding with implementation of the project in the form in which it is presently envisaged. Such a worth full road upgrading development, which will bring net benefit of improving import and export to Nation in general and the improvement of living standard of local communities in particular, should be implemented at the earliest possible date.

1. INTRODUCTION

1.1. Introduction and Purpose

The Lowyaddo-Farddaha-Borama road upgrading project has been selected to pass through detailed Feasibility Study, Environmental and Social Impact Assessment, RAP, Detailed Engineering Design, Cost Estimates and Preparation of Bidding Documents for upgrading to Paved (Bitumen) Standard, which is needed to establish the fully substantiated detail economic justification for alternate types, rehabilitation measures and investment strategies for the specified project. Most of the towns and/or villages next to Garisa are located in Awdal Region while the others stretching from Lowyaiddo up to Garisa belong to Salal region (the newly emerging region which encompasses areas of the then Awdal Region)

The Lowyaddo-Farddaha-Borama road project connects Lowyaiddo, Zeyila, Farddaha, Bon and Borama major towns and several villages such as namely Ashado, Ealgal, Garisa, Hogferes, Ferdihun, Hungry, Werar, Degahamedo, Halemale, Wunad, Quljet, Jirjir, and Fulaful.

The Somaliland Roads Authority believes that infrastructure development and socio-environmental protection should go hand in hand. ESIA is understood as an integrated part of the planning process devoted to characterize socio-environmental impacts due to the upgrading of a project. It also seeks to define policies and strategies required to monitor and control such impacts. Hence, in order to understand the impact of the proposed road project on various physical, biological and socio-environmental factors and to propose appropriate measures to overcome adverse impacts, ESIA is taken as part of the project feasibility study.

During the reconnaissance survey, the consultant had four alternatives routes and recommended the best alternative which has been exposed to current ESIA. The do nothing option was not also recommended as the project will have immense potential for economic development without affecting the environment adversely

The fundamental objective of the ESIA study is to ensure that upgrading of the project is environmentally sound and contributes to the development. It is also expected to provide a means whereby the overall environmental performance can be enhanced through.

- Identification and evaluation of the potential impacts associated with the project implementation and operation
- Preparation of plans and recommendations regarding measures that would minimize the adverse impacts and enhance the beneficial impacts.

1.2. Scope of the Service and Objectives

The scope consultancy services are:

Phase 1:

Economic Feasibility Study, Environmental and Social Impact Assessment, and Preliminary Design for upgrading and widening of the existing road to comply with the design standards for a Class II paved road with the design life of 20 years;

Phase 2:

Preparation of a Detailed Engineering Design, Resettlement Action Plan and Production of prequalification and Bidding Documents and Contraction Drawings.

Phase 3: Post-Design Services

The main objectives of the services stated under each Step are:

- Feasibility Study, including alternative alignments and pavement design options, environmental and social impact study, road safety assessments, land acquisition, preliminary design, economic and financial analysis;

- Detailed engineering design for the approved road alignment option; including all necessary data collection including detailed pavement investigations/ evaluations, field surveys and analysis to cover all aspects of detailed design;

- Environmental and Social Impact Assessment (EIA) in accordance with Somaliland legislation and African Development Bank (AfDB) guidelines;

- Preparation of a full Resettlement Action Plan and associated surveys to identify and value property that will be affected by the road upgrading works and the establishment of the road reserve;

Preparation of bidding documents, among others addressing national and international environmental and social requirements based on the approved detailed designs, prepared following African Development Bank requirements for international competitive bidding. The Consultant shall prepare all necessary documents, as applicable for the prequalification of contractors, totally in accordance with the current version of the African Development Bank's Standard Bidding Documents for the Procurement of Works, and including abbreviated specifications of the work to be performed, forms, invitations to pre-qualify and draft advertisements.

The specific objectives of the ESIA are:

- To describe the baseline information of the project area.
- To assess positive and negative impacts of the project on biological, physical, social and economic environment.
- To assess the loss of land use types.
- To assess and forecast the number of people to be displaced due to the project
- To evaluate the views of interested and affected parties
- To assess the social services on the project site such as schools, health center.
- Design mitigation methods for the negative impacts and develop Environmental Management Plan.

2. The Project Road

2.1. Project Description

The Project road Lowyaddo-Farddaha-Borama is found in Salal and Awdal regions of the Republic of Somaliland. The distance between Borama to Hargeisa is 118 Km by road. The Borama-Lowyaddo road is an important trade road, which connects Djibouti, North Somaliland, and Ethiopia with a significant regional integration and economic development potential.

From start to end, the project road crosses major towns and villages namely Lowyaddo, Tokosh, Zeyila, Ashado, Ealgal, Garisa, Hogferes, Farddaha, Areworen, Ferdihun, Hungry, Werar, Degahamedo, Halemale, Wunad, Bon, Quljet, Jirjir, Fulaful and Borama.

The geographic coordinates for the start and end point of the project road are Easting 310329 Northing 1267105 and Easting 300621 and Northing 1099047 respectively, the elevation of starting point is about 4 m above sea level, while that of end of the project is about 1450 m above sea level with 1585 m.a.s.l around Quljet town (highest elevation) and 2m.a.s.l. in Zeyila (lowest point) The proposed project centreline passes through flat and rolling and mountainous terrain. The total length of project road is about 256 kms. After its completion the upgraded road will improve the overall socio-economic aspect of the Republic of Somaliland and contribute its own share towards reducing travel time, maintenance cost and the riding quality of traffic movement along the route. The following Table shows the project description.

Table 3: Project Description

Description	
Carriageway	7 meter
Shoulder width	1.5 meter
Pavement type	Bituminous Surface
Construction Technology	Machine based and labour
Parking Lane (m)	3.5 m
Walk way width (m)	2.5m

Ditch	On each side

Along the route there are a number of towns and villages. Detail of towns and villages along the road is shown on the table bellow

Table 4: Major Towns and Villages along the Project Road

No	Village/Town Name	Geographical location UTM Zone 38N Datum WGS84		
		Easting	Northing	Elevation(m)
1	Lowyaddo	310329	1267105	4
2	Birsile	315292	1263325	12
3	Tokosh	327261	1254938	4
4	Zeyila	333469	1255372	2
5	Asha Addo	329751	1235409	20
6	Ealgale	329533	1213747	86
7	Garisa	328649	1172428	241
8	Hog Feres	332229	1160099	394
9	Farddaha	330307	1150996	560
10	Areweren	318555	1144314	755
11	Fardihun	313209	1138141	930
12	Werar	307857	1134696	1300

No	Village/Town Name	Geographical location UTM Zone 38N Datum WGS84		
		Easting	Northing	Elevation(m)
13	Degahamedo	303395	1137017	1293
14	Halemale	299812	1132037	1225
15	Bon	290596	1127459	1345
16	Quljet	282020	1116157	1585
17	Borama	300621	1099047	1450

2.2. Project Visual Assessment

According to the visual assessment of pavement condition on all existing roads, visual structural condition survey of drainage structures and an inventory of road furniture carried out. The existing pavement condition of the Lowyaddo-Farddaha-Borama existing gravel road project road alignment can be divided in to two sections.

- The road along the flat and coastal plain i.e. from the start of the project (Lowyiddo) to Farddaha is an earth trail or earth track with no defined alignment that stretches on alluvial sand deposit with poorly ride able section. This section of the alignment has been interrupted by several big span seasonal rivers (some greater than 300m), where at some locations the road is going in the river course.
- The pavement condition of the rest of the alignment road is characterized by very poor eroded gravel road with highly deteriorated sub-grade on the rolling and mountainous terrain section of the road. It was seen that this part of the alignment is characterized by rough and poorly rid able road. This is because of the oversized gravel wearing course and complete loss of the gravel associated with erosion.
- There exist a number of undefined hydraulic crossings mostly existing in the low land.
- Erosion and erosion hazard on the mountainous range of the road portion
- Slope instability and land sliding occurrences also been observed on the mountainous range

- Soil on low lying coastal Palin; which is close to the sea looks whitish due to salt deposited after the recession wetness evaporates.

The consultant believes the condition survey record will indicate the relative performance required during construction and stress sustainability of the road bed soils under the existing traffic.

Currently the road is rendering traffic movement mainly big trucks coming from Djibouti and medium vehicles coming from within the Somaliland towns and villages; which can cover the product transport of import and export goods although it is deteriorated. The road is therefore under the status of losing the required quality and causing traffic damages, generally under very poor condition. It is envisaged to improve the standard and the quality of the existing poor condition gravel road to bitumen standard.

2.3. Project Core Activities and Ancillary Facilities

Project activity description will assist to visualize the location and extent of potential impacts of the Project on the bio-physical as well as socio-economic environment of the area. On this basis, the principal project activities expected to be considered, among others, as causing either beneficial or adverse environmental impacts are:

1) Realignment of some sections to ease grade, curving and avoid high number of drainage crossings and or get favorable crossings.

2) Camp establishment and demolishing;

3) Land clearing and grubbing (widening);

4) Earthwork operations;

5) Blasting operation

6) Crushing;

7) Asphalt plant operation;

8) Workshop activities;

9) Structures;

10) Construction machinery and vehicle operation; and

11) HIV/AIDS prevention and Control activities

The project ancillary facilities include camp site, diversion road, borrow sites and quarry areas. Diversion road is required especially along the flat terrain section as it is impossible to traffic movement during the rainy season. At least 4 camp sites are required for this project road as it will be divided in to 4 lots; identifying the camp site is the responsibility of each contractor who will win the respective lots. Currently the consultant has identified 19 borrow areas and 20 quarry sites starting from km 7+000 up to km235+900RHS and LHS.

The construction and operation of this road will result in a variety of environmental and social impacts. Many of the changes will be beneficial, particularly in terms of increasing the reliability of road transport and the potential to develop the local economy. There will nevertheless be some adverse impacts on the physical, biological and socio-economic environment. Major potential adverse impacts include:

- Loss/clearing of vegetation due to land acquisition for the reasons mentioned above
- Impact on biodiversity (flora and fauna)
- Impact on water resource.
- Impacts on soil erosion
- Land sliding and slope instability
- Impact on homestead plantations
- Loss of land under various uses due to land acquisition for the right of way, realignments, bridge building/culverts, detours, quarries and borrows pits, and for construction works.
- Increased soil erosion due to ground disturbance and alteration of drainage systems.
- Slope destabilization due to cutting and filling on steep slopes.
- Alteration to the drainage regime and water pollution due to redirecting of watercourses at culverts and bridges enhanced soil erosion, operation of quarries and borrow pits, disposal of wastes, etc.
- Air and noise pollution due to construction activities and operation of construction machinery.
- Loss of commercially important trees due to widening of road width.
- Increased risks of communicable diseases such as the project area is totally malaria prone area

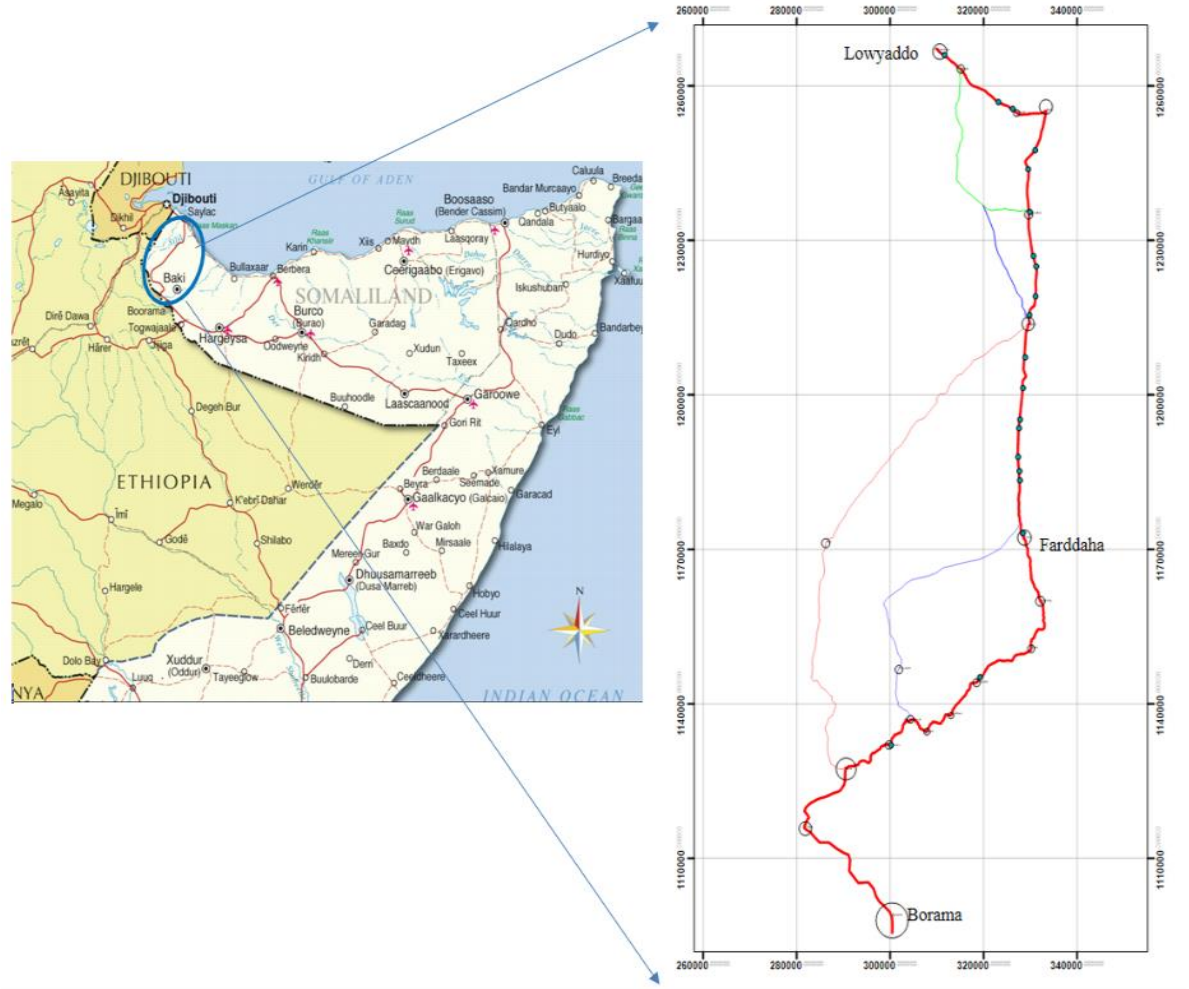


Figure 1: Location Map for Lowyaddo-Farddaha-Borama Road Project

3. BASELINE INFORMATION

3.1. Physical Environment

3.1.1. Topography

The Lowyaddo-Farddaha-Borama road project is located on the South Eastern part of the Republic of Somaliland. The topography of the surrounding area is generally characterized by flat and rolling terrain with some section of project site is featured by mountainous terrain, Bon-Hungry section. The terrain classification of the project road is flat (57.6%), flat to rolling (19.7%), rolling (6.3%) and mountainous (16.4%).

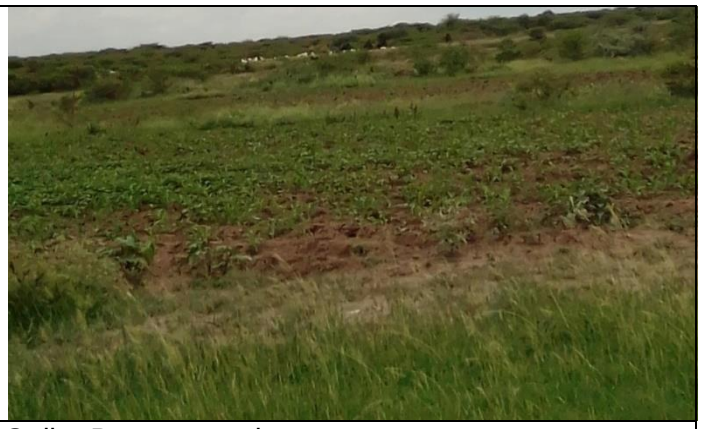
The altitude of the project area is in the range from 2 m.a.s.l. to 1585 m.a.s.l.(Quljet area), the average altitude is about 794.5 m.a.s.l. It is relatively higher near the Quljet town, which is about 1585 m.a.s.l. The altitude falls to 2 m.a.s.l. on Zeyila town.

Figure 2:Pictures showing mountainous topography of the project

Degahamedo-Halemale section

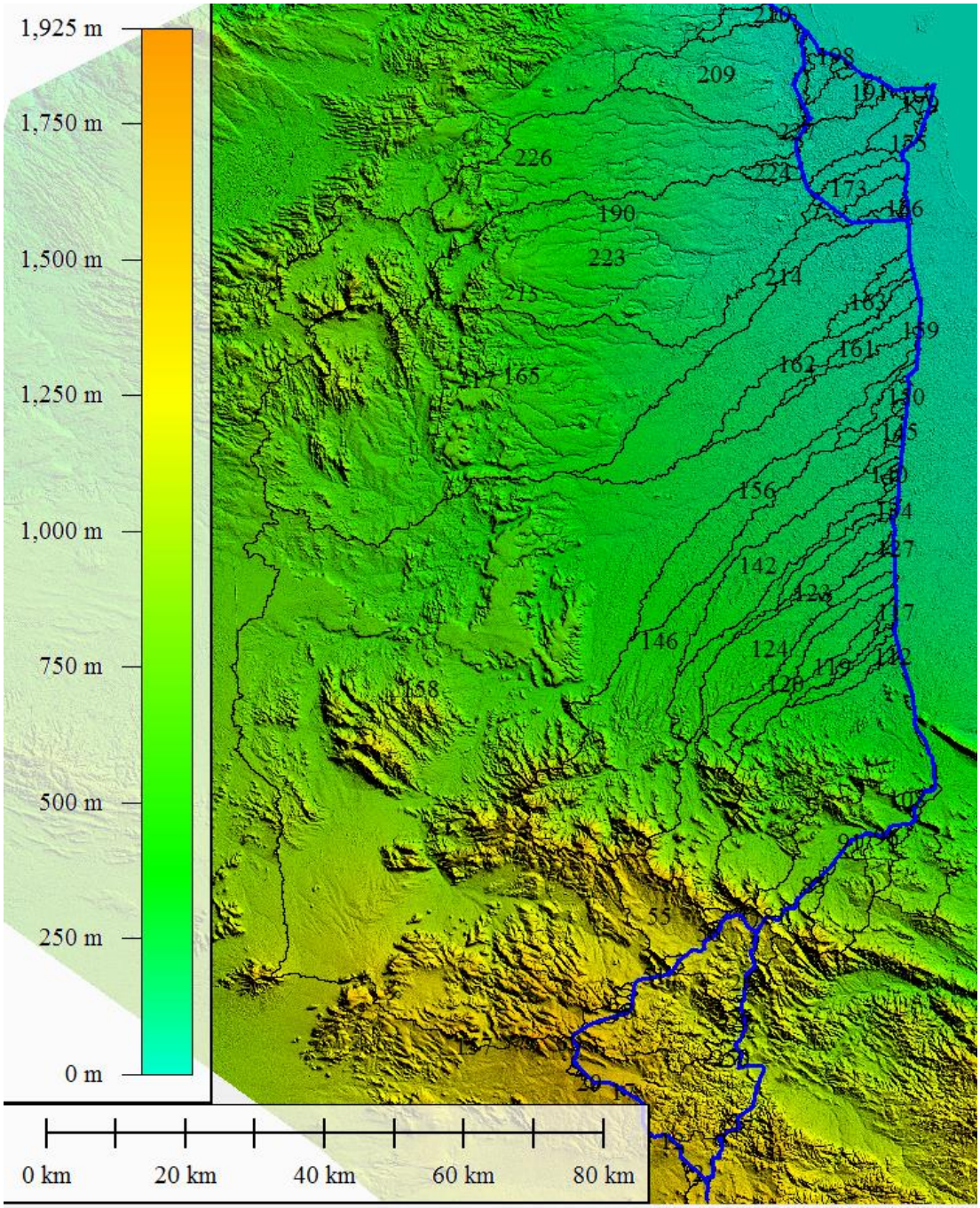
Figure 3 :Pictures showing flat- rolling topography of the project

Bon-Borama Section



Quljet-Borama section

Figure 4: Showing Topography (Elevation) along the project area


1,925 m
1,750 m
1,500 m
1,250 m
1,000 m
750 m
500 m
250 m
0 m
0 km
20 km
40 km
60 km
80 km

3.1.2. Geology

The geology of the project area is covered by rocks dating from Pre-Cambrian to Recent, comprising sedimentary, igneous and metamorphic rocks. The tectonic arrangement of rock outcroppings in the region is complex and severely affected by many different systems of faults and fractures, mainly oriented parallel to the coast (i.e. WNW-ESE).

Most sedimentary rocks are limestone and sandstones, igneous consist mostly of basalts and rhyolites, and metamorphic rocks show a range of different rocks such as marbles, gneiss. Along the coast some sands and quaternary alluvial deposits form the greater part of the outcropping lithologies.

The basement complex covers an extensive area of the Al Mountains around Borama and Baki districts. In other parts of the region, it is covered by Jurassic limestone and Miocene bio-limestone, Pleistocene basalts and recent alluvial and aeolian deposits. Igneous rocks consist mostly of basalts and rhyolites, and metamorphic rocks include a wide range of schists, orthogneiss, quartzite, migmatites, marble, calcsilicate and paragneiss, intruded by granite, diorite and gabbro.
Pleistocene basalt outcrops and other volcanic rock outcrops occur dispersed along the northern escarpment and coastal plain.

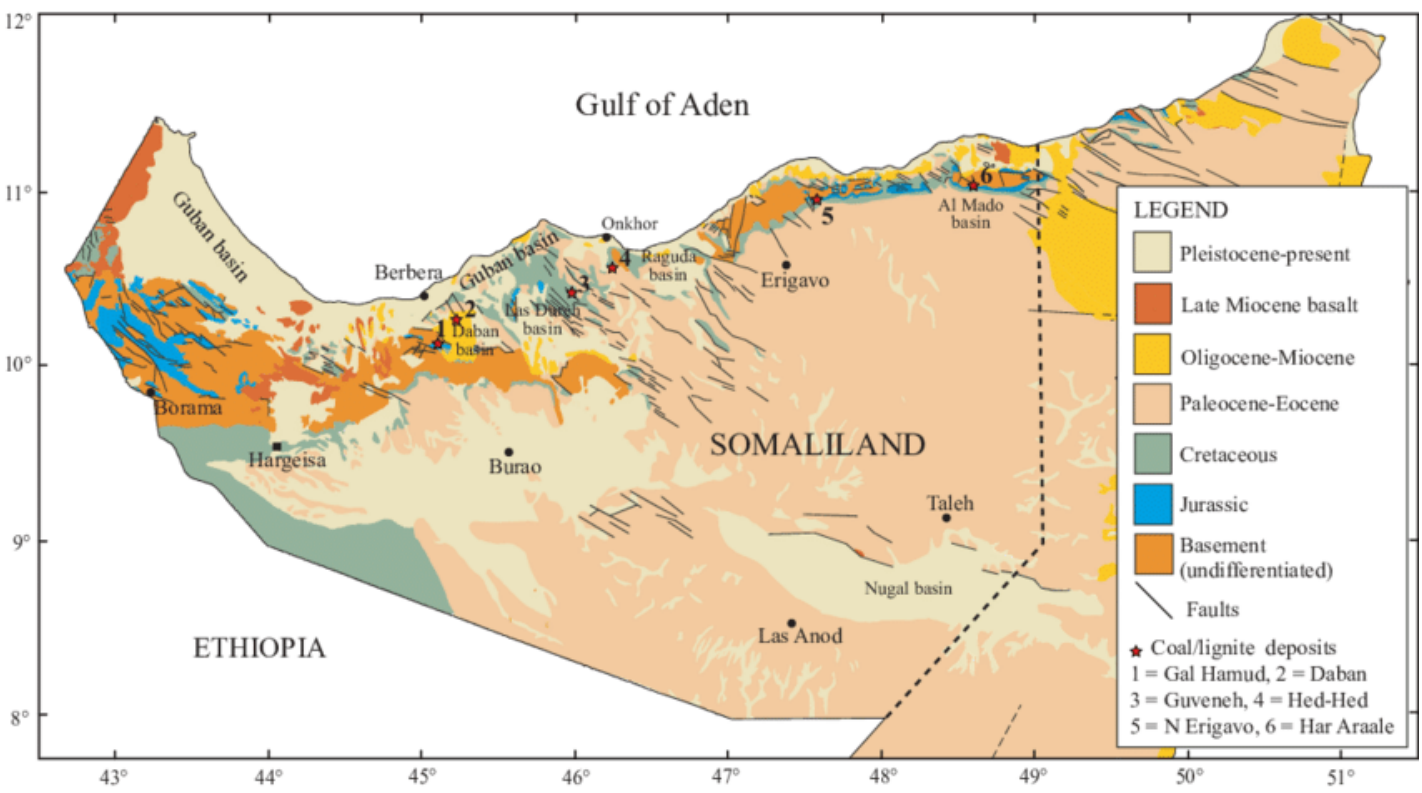


Figure 5: Geological map of the project area (Source Geological Map of Somaliland)

3.1.3. Soils

Somalia has various soil types, primarily according to climate and the parent rock. The northern part of the country (Somaliland and Puntland) has shallow sandy and/or stony soils and some deeper lime-rich soils. In the highlands around Hargeisa, relatively high rainfall has raised the organic content in the sandy calcareous soils characteristic of the northern plains. This soil supports some rain-fed farming. South of Hargeisa begins the “Haud” region whose red calcareous soils continue into the Ethiopian Ogaden and support vegetation which is ideal for camel grazing. Deep clay soils are found south of Gebiley in Somaliland.

The central part of the country is dominated by sandy soils along the coast and moderately deep loamy soils with a high content of calcium carbonate and/or gypsum further inland. Prominent in southern Somalia are low-lying alluvial plains, associated with the Juba and Shabelle Rivers. These plains mainly have clayey soils, some of which have poor drainage and/or high content of salts. Some of the riverine areas are also liable to flooding. The inter-riverine areas have both shallow soils (particularly towards the border with Ethiopia) and deep loamy and clayey soils.

On the Lowyaiddo-Farddaha-Borama road based on the soil survey there; the predominant soil type in the area where the project site accounts about 60% of the land is sandy soil. There exist also intermittent occurrences of clay and silt soils in some cases boulders on the mostly eroded portion of sloppy topography along the project road. The soil Characteristics for the sandy soils, they are with less water holding capacity as they water drains during the rainy season and are with high evaporation capacity during the dry season. The clay soils types are prominent in southern Somalia are low-lying alluvial plains; associated with upstream rivers. Those soils were recognized to leave salts of calcium carbonate on the surface of the ground.

Figure 6: Pictures depicting soils in the project area

	
On the Coastal low lands	On the range of Mountainous and Mid lands

3.1.4. Climate

The project area is located predominantly in the Awdal region in the range of plateau, mountainous and the Coastal plain zones where climate is dependent on the topographic features. The average temperature in the project area, comprising about 65% (the plateau and mountainous zones) ranges from 25 to 35 °C. The Coastal Plain is a zone with high temperatures and low rainfall. Summer temperatures in the region easily average over 38 °C. However, temperatures come down during the winter as it reaches up to 45 °C during the hottest days.

The climatic condition of the project area lies in the range of semi-arid and arid. The average annual rainfall is 446 millimeters (17.6 in) in most parts of the project area while the coastal zone, which is arid climate and receives less precipitation than the rest of the project area.

The major, rainy season (late March, April, May, and early June) experiences the heaviest rainfall in the plateau and the coastal range gates rain while the plateau and the mountainous area are in dry condition. This constitutes the period of fresh grazing and abundant surface water.

3.1.5. Water Resources and Drainage

3.1.5.1. Water Resources

The primary source of water is rainfall and the Project Road crosses numerous small drainage which is connected; to the Gulf of Aden drainage system. The Project Road drainages drain to red Sea with in the Gulf of Aden river basin. Local enquiries indicate that in most cases these streams are dry outside the wet season except with the back flow accumulations on the coastal land. There exist a number of ponds and major rivers along the project road, there is one perennial river on the Farddaha-Borama stretch.

The contractors will require considerable volumes of water with various aspects of the works. Water supply for works such as compaction, mortar and concrete works of the road project and these will probably be drawn from water courses adjacent to the road, where flows are limited during the dry

season. Wells and springs can be used as an alternative water sources. Maximum care must be taken as those areas are also the main sources of potable water for both human and livestock animals.

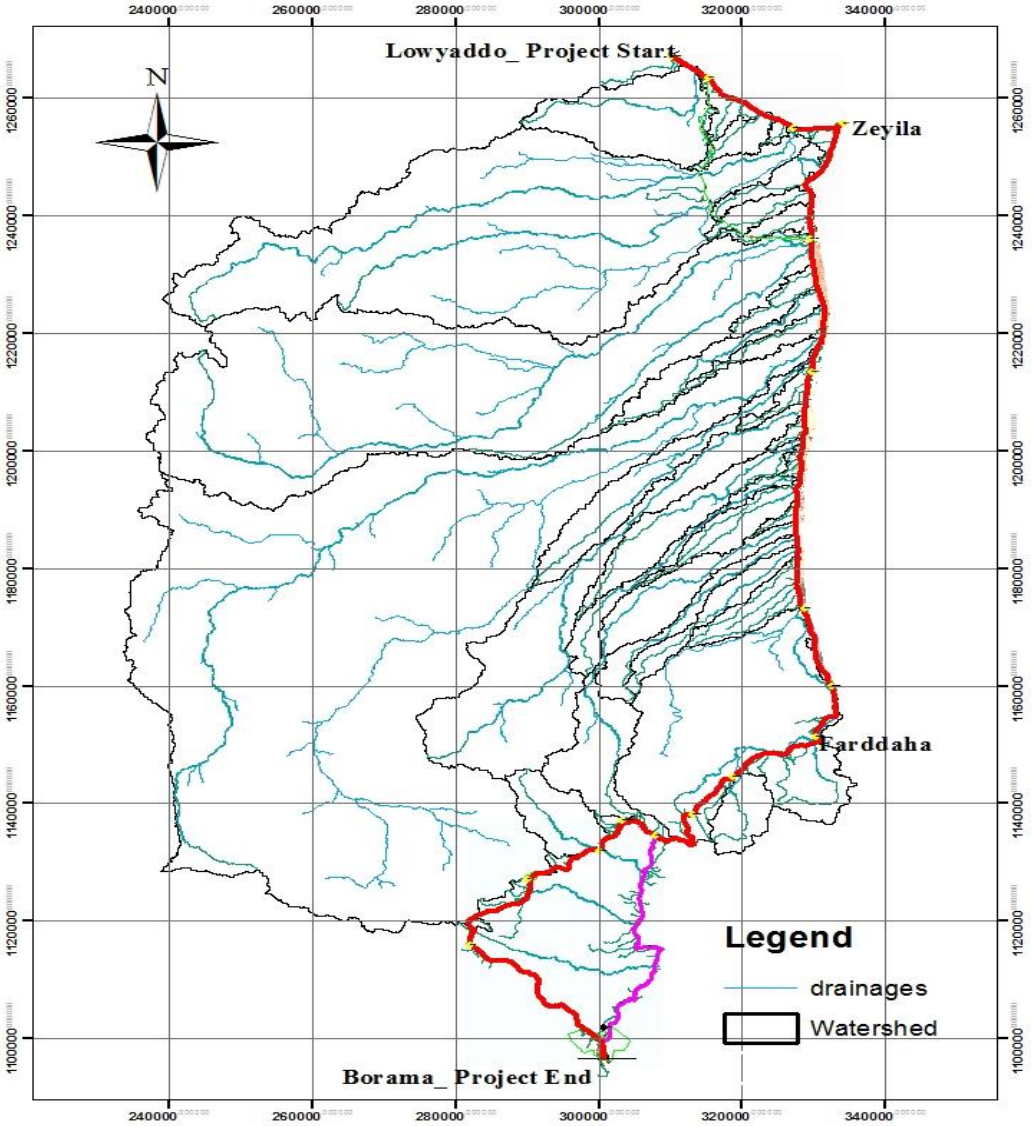
Figure 7: Water Source along the Route

Water sources (seasonal) alongside the route observed; Lowyaddo to Farddaha (left) and Farddaha to Borama (right).

3.1.5.2. Drainage (Watershed)

There are some perennial rivers and streams draining across the project site originating from the relatively high altitude areas. The drainage follows from a relatively highlands areas adjacent to the road alignment to the low laying area villages mostly very close to the end portion of the project road and finally drain to the Gulf of Aden Basin System. There are also rivers with a very wide span, ponds faced alongside the road during site visit.

Figure 8: Watershed map of Road Project



3.1.6. Land use and land cover

Assessments done through field observation, and available information from the local administrations transected by the project road revealed that the major land use/cover of the first portion of the Farddha-Borama section area is predominantly comprises bush land, grazing, and some farm land and settlement areas alongside the road. The vegetation of the project area is semi-arid with scattered trees; the trees in the area are mainly Acacia spp*, Balanites aegyptiaca*, *Zizphus Spina Christi*, etc which are scattered all over the area with grass species which are overgrazed. On the lower section Loyiaddo-Farddha stretch the project road transects a mix of the same vegetation type as is observed on Farddha-Boroma and changes its nature as it is closer to the low land coastal plain which is predominated by arid and semi-arid thorny grass species sparsely existing with some dwindling semi-arid trees in the interface. There exist also in some cases dense bush land forming patches of vegetation inhabiting the wet lands and/or flood plains closest to the red sea. Such vegetation was observed on the section between Zeiela and Lowyaddo.

The proposed Lowyaddo-Farddaha-Borama Road Project will generally traverse through rarely occurring farm lands in the relatively high lands of Borama-Bon areas. There is also a limited number of irrigation area in the high land to mid land area of privately owned investors and small holders' farmers, settlements of various villages/towns and hence much vegetation and wildlife resources will be affected by those interventions. In the low land coastal plains the vegetation occurrence is very sparse in the saline plain but the hard grass, which is adaptable to saline environment occurrence is cosmopolitan.

The human settlement in this project area are mainly include per urban towns and villages mixed with cattle camps near the homestead, the houses include grass thatched, wood with Plastic roof houses, concrete structures and Fences, some with corrugated iron and containers which may last for a few years and then renewed. The villages and towns along the proposed road project are listed in section 1.3, Table 4.

The biggest town in the area is Borama town capital of the Awdal Region. Most of the populations in the project area are pastoralists, taking care of cattle with small cultivation of food crops such as sorghum,

beans, etc. Many pastoralists are becoming agro pastoralists by including subsistence crops in their farming systems.

Figure 9:Showing Towns along the road project

Bon

Lowyaddo

Garisa

Ziela

Lowyaddo

Red sea beach at Lowyaddo

Figure 10: Pictures Depicting Land covers of the project area

Land cover along the Bon-Borama

Land cover along the Bon-Farddha section




Land cover on Farddha-Lowyaddo section

3.2. Biological Environment

3.2.1. Flora

The Lowyaddo-Borama road project is predominantly located in the Awdal Environmental Protection Region and has three distinct topographical zones in relation to the vegetation occurrences. Starting from the north along the sea is coastal zone which stretches from Sahil region in the east to Republic of Djibouti in North West. The three distinct zones include: The coastal zone, Mountainous Zone and upland terrain (plateau).

The description and classification of those zones is indicated below.

No	Name of Zone	Description
1.	Coastal Zone	This zone is brutally hot, sometimes more than 45-degree Celsius, during the summer, from May to September, and receives lesser rain than other zones in the region. This zone is locally known "Guban" which means "burned" in English and its dwellers are called "Qorax-joog" (Sun dwellers). The coastal zone usually gets its rain during the winter season when other zones are in dry season. Known locally as Hais", the rainy season is usually from December to January. Because of its low rainfall, the vegetation in coastal plains consists of different types of *grasses and a few hardy scattered acacia trees*. All dry rivers from mountainous zone end up in coastal plains and during the rainy season runs-offs from mountainous zone end up in the low coastal plains and bring alluvial soil.
2.	Mountainous Zone	1 Next to coastal zone in the south is the Mountainous Zone known as Golis. The mountainous zone is 600 to 1000 meters above the sea level and gets Gu" rains during the months of April to September. Some areas of this zone adjacent to coastal areas also get some of winter (Hais) rains received by the coastal zone. Because of this, the zone gets more rains than the coastal zone, and has, as a result, more vegetation. The zone is also characterized by the existence of many dry rivers with running water streams throughout the year. There had been thick forests in the valleys and along banks of the river beds. 2 Prevalent bush plants are Khansa, acacia, aloes, Boswellia and Commiphora which yields fragrant resins and balsams such as myrrh, frankincense

Table 5 :Vegetation type in the Lowyaddo-Borama Road Project

The Riparian Vegetation: There is a narrow band of riparian vegetation of almost similar species composition as the woodland on the rolling and mountainous slopes. Due to ample moisture, trees found at the edge of the riverbank are not affected by fire as the rest of trees far away from rivers in the study

area. Riparian vegetation along the riverbanks may be understood as giving ecosystem functions such as corridors connecting wet forests, being refuge for some plant species and biodiversity banks for wetter forest elements.

Figure 11: Pictures illustrating the Flora of the project area

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Riparian vegetaion on Bon-Borama section</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Upland Vegetation</td></tr>
</table>

Coastal land vegetaion

3.2.2. Wildlife

Based on the assessment, the number of wildlife species in the project area is reasonably high as the project area has faced transactions from previously existing vegetation to land degradation mostly occurred on the mountainous topographic zonation. The current relative existence of variety of wildlife species can be correlated to environmental disturbance which had happened in the earliest days. Therefore more wild life is expected to live in the coastal zone and the mountainous zone than the upland zone.

A colonial governor from Zeila travelled along the coastal zone in 1887and described the rich vegetation and heavy forests along the banks of dry rivers in the coastal plains, some of which with running streams. He also wrote about the rich vegetation and the presence of wild animals such as *elephants*, *antelopes*, *lions*, *leopards*, *black panthers*, and different types of birds.

There had been thick forests in the valleys and along banks of the river beds that had been a conducive environment for various wild animals such as lions, kudu, Oryx, leopards, cheetah, mountain dik-dik (Ala-kud), Gazelles and even elephants. It is said that the last elephant in Somaliland has died in the 1940s in Dibirawein Valley, now in Baki District, and some of its bones are still sitting there. However, since the 1970s, almost all valleys and banks of the dry rivers with running streams were turned into irrigated farms

and, in the process, the thick forests were cleared, burned for charcoal and/or used for construction purposes and, consequently, the wild animals hunted, killed or migrated as their habitats completely were devastated by human intrusion. People in this zone were pastoralists and reared goats and sheep and a few camels. With the introduction of farming, the livestock population has also declined as the wild animals.

Most of the people in this zone are sedentary agro-pastoralists that mix cultivation of cereals crops in rain-fed farms with livestock keeping in small cattle numbers such as cattle, sheep, and goats. The Ogo Zone is densely populated and suffered the worst environmental degradation.

Table 6 :Major wildlife species in the project area (fauna)

1 No.	2 Common Name	3 Scientific Name	4 Remark
1	Gazelle	*Oryx gazella*	High land
2	Oryx	*Beisa oryx*	High land
3	Salt's dick dick	*Madaqua saltina*	High land
5	Leopard	*Panthera pardus*	Mid land and high land
6	Cheetah	*Acinonyx jubatus*	Mid land and low land
7	Antelop		Mid land and low land
8	Lion	*Panthera leo*	Mid land and low land
9	Elephant	*Loxodonta africana*	Endanger/extinct
10	*black panthers*	*Panthera pardus*	Wood land (high-mid land)

1 No.	2 Common Name	3 Scientific Name	4 Remark
11	Ostrich	*Struthio camelus*	Low land plain

3.2.3. National Parks

Owing to the extreme variations in climate and terrain, and comprising most ecological systems from altitude1450masl to -2masl, the route corridor possesses one of the largest and most diverse plant genetic and wildlife resources in the world.

In Somaliland, wildlife species live in diverse ecosystems, from the desert lowland coastal plain to the highest elevation of the project end, Borama. The Valley and the peripheral lowlands and mid altitudes of the country have also abundant wildlife and plant populations with huge sum of endemism.

Based on the information obtained during first hand interview to dwellers and documents reviewed there are 5 National Parks in the Republic of Somaliland include Daallo Mountain, Hargeisa National Park,Hobyo grasslands and shrub lands, Jilib National Park, Kismayo National Park and Lag Badana National Park, however no parks, and priority forest areas along the proposed route corridor. Concerning wildlife sanctuaries (game reserve) there exists Zeyila partial reserve with a large number of wild lives occupying the harsh climatic condition of the project route areas. Therefore, the impact of the project on the vegetation and wildlife resources is expected to range from low to medium.

The Awdal including the project route corridor is said to be reach in wildlife resources. Among them, the most important one, which are rarer at other parts of Somaliland include Lion, Sudan cheetah, reticulated giraffe, hamadryads baboon, civet, Serval, African bush elephant, bush, ibex, kudu, dick-Dick, oribi, reedbuck, Somalia wild ass, gravy's zebra, Hyena,. According to local, there also a variety of vegetation, birds and wild animals in the region since most of the area, in relative terms, is still undisturbed.

Regarding the overall influence area during prioritization has been well screened in all the routes. Besides to the information gathered regarding fauna and flora verification of the mentioned routes have been done which of the routes are critically in touch with Environmentally Sensitive areas include National Parks and other gazette areas of valuable importance. In this case no National Parks and gazetted areas do exist in the whole influence area.

3.3. Socio economic condition

3.3.1. Administration

The Lowyaddo-Borama road project route is envisaged to link two different Regions, Administrative units namely the Awdal and selal Region (newly established Region); which is not officially/legally approved. There are about 17 towns and villages across the project road; some of them serving as district of each Regions. Borama and Zeyila are serving as Headquarters of Awdal and Selal serve Regions respectively. Following the existing Lowyaddo-Borama road Lowyaddo-Garisa belongs to Selal Region and Garisa-Borama belongs to Awdal Region. Bon is one of the districts in Awdal Region; whereas other towns such as Lowyaddo are sub districts and village towns.

Currently the Awdal Region is conducting the overall administration including Selal; however in terms of sector and sectorial administration Selal is taking responsibilities including all sectorial disciplines such as Education, Health, Fishery etc.

Serial No	Village/Town Name	Geographical location UTM Zone 38N Datum WGS84		
		Easting	Northing	Elevation(m)
1	Lawyiaddo	310329	1267105	4
2	Brisile	315292	1263325	12
3	Tokosh	327261	1254938	4
4	Zeyila	333469	1255372	2
5	Ashado	329751	1235409	20
6	Ealgale	329533	1213747	86
7	Garisa	328649	1172428	241
8	Hogferes	332229	1160099	394
9	Farddaha	330307	1150996	560
10	Areworen	318555	1144314	755
11	Ferdihun	313209	1138141	930
12	Werar	307857	1134696	1300

Serial No	Village/Town Name	Geographical location UTM Zone 38N Datum WGS84		
		Easting	Northing	Elevation(m)
13	Degahamedo	303395	1137017	1293
14	Halemale	299812	1132037	1225
15	Bon	290596	1127459	1345
16	Quljet	282020	1116157	1585
17	Borama	300621	1099047	1450

3.3.2. Demography, Ethnicity, Language and Culture

The Awdal and Selal; with all demographic and administrative data belongs to the Awdal Region. Population density varies between 2 persons per Km^2 to about 30 persons per Km^2 , considering the population of the then Awdal Region equivalent to 673,264 (UNFP 2014). Those areas are a home of the people with similar faiths. Different religions co-exist in the area in small proportion through the dominantly proportion of the people are Muslim followers, Islamic faith followers.

The population of the project road influence area predominantly inhabited by the Somali ethnic groups with Gadabuursi subclan of Dir especially well represented and considered the predominant clan of the Region. There are no major conflicts reported so far between tribes for personal interests. However, there are minor conflicts emanating from natural resource use.

There are no ethnic minorities or tribal people in and alongside the project counties at area whose traditional lifestyles could become compromised through the development of the proposed Lowyaiddo-Borama road project.

The available data and information from the republic of Somaliland and the then Awdal Region Administration indicate that the major ethnic groups in Project route corridor are mainly Somalian Ethnic Groups, which are approximately about 90% of the total population.

It is also noted that the remaining 10% accounts to the non-Somalia groups include Bantus, Bajunis, Ethiopians, Indians, Pakistanis, Persians, Arabs, Italians, Swedes, and Britons, and the Like. The population distribution in the respective as well as religious distributions and languages used are available in the sections following. Somalia has been described as the most ethnically homogenous nation in Sub-Saharan Africa, ahead of Botswana, which is four-fifths Tswana.

Somali is the official language Somali, other languages spoken are English, Arabic and Italian. Environs and Religious Distribution of Project Areas and its Environs will be provided during the next phase of the study.

Somalis constitute the largest ethnic group in Somalia, at approximately 85% of the nation's inhabitants. They are organized into clan groupings, which are important social units; clan membership plays a central part in Somali culture and politics. Clans are patrilineal and are typically divided into sub-clans, sometimes with many sub-divisions. Through the *xeer* system (customary law), the advanced clan structure has served governmental roles in many rural Somali communities.

Somali society is traditionally ethnically endogamous. So to extend ties of alliance, marriage is often to another ethnic Somali from a different clan. Thus, for example, a recent study observed that in 89 marriages contracted by men of the Dhulbahante clan, 55 (62%) were with women of Dhulbahante sub-clans other than those of their husbands; 30 (33.7%) were with women of surrounding clans of other clan families (Isaaq, 28; Gedabursi, 3); and 3 (4.3%) were with women of other clans of the Darod clan family (Marehan 2, Ogaden 1).

3.3.3. Population in the Project Area

The size and demographic features of population are important variables in the equation of the development process, for they determine the pattern of resource utilization. Accordingly, this section presents the population profile traversed by the road project.

The Somaliland population was estimated at 3.6 million in 2014 and was projected to hit 4.2 million in 2020 at an annual growth rate of 2.93%, with bulk of the population living in urban centres. Somaliland

has a young population with 37.8% of the population being less than 15 years old, and roughly 72% of the population being under 30 years (SLHDS, 2020). This population growth is an indicator of increased future demand for transport services within the project road corridor.

The population of Awdal region, where the project road corridor located is estimated to be 673,264 (UNFPA 2014).

3.3.4. Economic Activity and Livelihood

The economy and livelihood situations of the project immediate influence areas populations are based on animal husbandry and subsistence farming. As we known, the communities in the high and/or mid land route corridor are mainly agro pastoralists, which is a mix of crop production and livestock rearing. Additional activities in urban areas include trade, self-employment and remittance. According to FAO, Northwest Baseline Report Issued September 14, 2011, which encompasses the project route corridor; sales of livestock and livestock products are the primary sources of cash income for all wealth groups, followed by self-employment, agricultural labor and crop sales. Urban towns provide the main labor markets for rural communities during times of crisis. The major portion of the poor household's income comes from livestock product sales (40%), livestock sale (11%), self-employment (26%), agricultural labor (16%) and crop sales (8%). Due to increased number of livestock species, the middle wealth category sold 1 local cattle, 8 goat/sheep, livestock products and crops for income. The better-off households get about 81% of their income from the sale of livestock and livestock products. Crop sales contribute 12% and remittances 7%. In the high land and mid land major crops grown are sorghum and maize.

The above data mostly fits to the high land and mid land portion of the route corridor, however the communities residing in the coastal plain relay predominantly in livestock rearing (pastoralists) and fishing and harvest of plant products such as sea cucumber.

***Animal Husbandry*:** - Livestock rearing is the major source of wealth and prestige and power. Sale of livestock and livestock products provide the main financial capital for agro-pastoralists. This is practiced throughout the year due to the type of livestock reared and fed using crop fodder in paddocks (semi-zero grazing) even during the dry season. Normal rains ensured normal pasture, fodder and crop harvests,

which translated to good livestock body conditions, improved livestock production, enhanced marketability of saleable animals and increased incomes and purchasing power of HHs. In spite of this, livestock production is constrained by lack of veterinary services, with agro-pastoralists relying on indigenous knowledge to manage parasites. In some instances, agro-pastoralists purchase drugs from veterinary centers. Women from all wealth groups sell most of livestock products. Those in the middle and better-off wealth groups engage in petty trade and in small business.

Coastal Zone dwellers

Livestock rearing in the coastal zone include rearing of camel, sheep and goats. During the summer seasons as the temperature of the coastal zone reaches up to 45^{o}c and the people move in to the mountainous zone.

Mountainous Zone dwellers

Pastoralists of the mountainous zones are farmers' rear goat; since goats are adaptable to these topographic features of the zone

***Crop Production*: -** Land preparation in the high land and low land begins in late March and in October. Various techniques of land preparation are used including tractors, oxen traction and hand plugging (mainly among poor HHs, with occasional assistance from the middle and better-off). The cost of hiring a tractor plugging for an hour is approximately USD 10, with the tractor able to plough 1 ha in 4.2 hours. Two main crops are planted in the livelihood zone: long duration (6 months) sorghum and short cycle (3 months) maize varieties. Sorghum is planted in the end of March to Mid-April and harvested in October, while maize is planted in February-March and harvested in July. As an agro-pastoral livelihood, labor opportunities normally coincide with the peak of agricultural activities (land preparation, seed sowing weeding, guarding and harvesting).

***Other Economic Activities*: -** According to locals, livelihood of citizen at the project areas are also engaged on traditional mining, catering services and other small scale business which are largely practice by town residents.

***Household Food Security*:** - Annual food availability for consumption indicates that what is produced by most of the households do not have enough to sustain their requirements throughout the year. Apart from own production, households in project area Agro pastoral livelihood source about 40-50% of their energy requirements from the purchase of staple (rice and wheat flour) and non-staple foods (sugar and oil). Like other parts of Somalia, the prices of imported items are linked to periodic monsoon tides that affect sea transport. The main markets that supply cereals consumed by most households are Borama high and/or mid land areas; which are relatively better in cereal production. In most cases, the poor obtained their main food items through market purchase; own production, relief food aid and gifts. Therefore, development interventions commensurate to the problem were recommended to help reduce those undesirable situations.

3.3.5. Social Services and Infrastructures

It has been observed during discussions in the consultation meeting that access to and utilization of services within the project area and its environs are very limited except telecommunication. In most cases people travel far to access almost any type of service, safe water supply points, health facilities, market centers, grain mill sites, access to credit facilities and the like. All these scenarios negatively impacted the health and wellbeing of family members in general and most importantly women including girls and children.

3.3.6. Transportation

All weather roads, mainly of loamy soils, form the main transport systems in project route corridor. These roads run across river beds, hills and mountainous terrain and are inaccessible during the wet seasons when flash floods render these roads impassable. The situation worsens where rivers/streams intersect. This consequently increases transport costs which indirectly affect the market prices of essential food commodities and a decrease in the general livelihoods of the local communities.

3.3.7. Telecommunication

Most of the villages have access to cellular services. About 4 cellular agencies (Telsom, Telecom, Somtel, and Nation link) operate in the Project route corridor. Communication services facilitate remittance flows, trade, information and local money transfers. Agro-pastoralists benefit from the use of telecommunication services by receiving and passing information on rainfall and pasture availability, water tracking and market prices of commodities.

3.3.8. Water Infrastructure

The main water sources in the project route corridor are water catchments and shallow wells. Most of the better-off and part of the middle, particularly those bordering Coastal low lands, have at least 1 berkad. However, about 20-30% of the berkads were in poor condition (cracked) due to ageing and a small number had been rehabilitated. During most of the year, water is available freely for livestock and for human use, but in the dry (Jilaal) season, water is purchased (at sometimes high costs) for 3-4 months.

No.	Town/village	Hand dug well	Shallow well	Deep well	Ponds	Barked
1	Lowyaddo					
2	Brisile					
3	Tokosh			√		
4	Zeila			√		
5	Ashado		√			
6	Ealgale			√		
7	Garisa			√		
8	Hogferes			√		
9	Farddaha		√			
10	Areworen			√		

No.	Town/village	Hand dug well	Shallow well	Deep well	Ponds	Barked
11	Ferdihun		√			
12	Werar			√		
13	Degahamedo			√		
14	Halemale		√			
15	Bon		√			
16	Quljet			√		
17	Boroma			√		
Total						

3.3.9. Health

Health and sanitation condition in an area is an indicator of the living standards of the communities concerned. However, the ratio of health facilities to population in the project is by far below the WHO's standard. The number of health institution in the same are also far below the required size, and accordingly become a major cause for a low health coverage. Locations of health institutions are other problems to improve health coverage. The long distance to the health institution and lack of transport facility seriously limit health coverage. Moreover, rapid population growth could not cop-up with the number of health institutions being constructed. A substantial size of health infrastructures are said to be not operational due to lack of health professional, lack of medical supply and equipment and in some case lack of repair and maintenance of facilities.

The prevalence of HIV/AIDs, which is one of the deadly diseases which have no cure so far, is in the project urban areas shall be assessed in the upcoming report. It is believed that communicable diseases will be a major concern during construction since the construction activity attracts an influx of construction work force that will be intermingled with local community. More data and information will be collected to

discuss in detail about health and sanitation situations of project affected area and the possible mitigation measures how to mitigate project induced health problems. The health institutions and health professionals along the road towns and/or villages are given in the following Table.

Table 7: Health Facilities alongside the road project

No.	Town/village	**Health Post**	**Health Centre**	**Clinics**	**Hospital**
1	Lowyaddo	0	1	0	0
2	Brisile	0	0	0	0
3	Tokosh	0	1	0	0
4	Zeila	0	1	2	0
5	Ashado	0	1	0	0
6	Ealgale	0	1	0	0
7	Garisa	0	1	2	0
8	Hogferes	0	0	0	0
9	Farddaha	0	1	0	0
10	Areworen	1	0	0	0
11	Ferdihun	0	1	1	0
12	Werar	0	1	0	0
13	Degahamedo	1	1	0	0
14	Halemale	1	0	0	0
15	Bon	0	1	3	0
16	Quljet	0	1	1	0
17	Boroma	0	9	10	1

Total	3	21	19	1

Source: Awdal Region Health Office

Table 8: Health professionals alongside the road project

No.	Town/village	**Doctors**	**Nurses (all type)**	**Pharmacist**	**Technician (all type)**
1	Lowyaddo	0	4	1	2
2	Brisile	0	0	0	0
3	Tokosh	0	5	1	2
4	Zeila	1	8	3	4
5	Ashado	0	3	1	1
6	Ealgale	0	0	0	4
7	Garisa	0	8	2	4
8	Hogferes	0	0	0	0
9	Farddaha	0	2	1	2
10	Areworen	0	0	0	0
11	Ferdihun	0	4	1	3
12	Werar	0	6	1	3
13	Degahamedo	0	0	0	1
14	Halemale	0	0	0	1
15	Bon	0	7	1	5
16	Quljet	0	7	1	5
17	Boroma	150	550	50	170

No.	Town/village	**Doctors**	**Nurses (all type)**	**Pharmacist**	**Technician (all type)**
Total		151	604	63	207

Source: Awdal Region Health office

3.3.10. Education

As per the preliminary assessments conducted during reconnaissance, the rural parts of Somaliland in general and that of the project route corridor in particular has limited access to education. The illiteracy rate was more pronounced among female community members than males.

Both formal and non-formal schools are available in most villages, although the quality of formal education is low due to lack of qualified teachers, limited equipment and poor educational infrastructure. Enrolment and attendance is regular for children in the better-off wealth group, while children in the poor and middle wealth groups attend school irregularly or do not attend school at all. More boys (60%) than girls (40%) attend formal schools. The better-off send at least 2 boys and 1 girl to school, whereas the poor and middle only send 1 boy or girl to formal schools. As much as children from the better-off wealth group access more educational opportunities, lack of secondary schools limit progression.

The distribution of schools and school facilities is therefore an indicator for the level of fulfillment of these basic rights of the communities concerned. The quality of education such as qualification of teachers, student-to-teachers ratio, student- to-classroom ratio, student-to-book ratio, commitment of teachers for their profession, etc. is also important parameters. According to previous studies, student-to-classroom ratios, qualification teachers and their commitment, school facilities, etc. are said to be not good. Data on this issue is not currently available and attempts will be made to collect those data and subsequent analysis will be made during detailed study phase of the project.

It may be good to reach the substantial number of pastoralist community through developing an alternative basic education centres in their areas. This strategy may help achieve a higher impact on the remote and marginalize communities.

Table 10: Number of Schools alongside the road project

No.	Town/village	Elementary	Secondary	Higher Education
1	Lowyaddo	1	0	0
2	Brisile	1	0	0
3	Tokosh	1	0	0
4	Zeila	1	1	0
5	Ashado	1	0	0
6	Ealgale	1	0	0
7	Garisa	1	1	0
8	Hogferes	1	0	0
9	Farddaha	1	0	0
10	Areworen	1	0	0
11	Ferdihun	1	0	0
12	Werar	1	0	0
13	Degahamedo	1	0	0
14	Halemale	1	0	0
15	Bon	2	1	0
16	Quljet	1	1	0
17	Boroma	52	17	9
Total		69	21	9

Source: Awdal Region Education office

3.3.11. Historical, Cultural, Religious and Archaeological Resources

New road construction should avoid destroying or downgrading sites of importance be it aesthetic, historical, religious, mineral, archaeological or recreational. Currently there are no historical or cultural sites reported &/or observed; which could be affected by the road project. No Burial places were also observed along the proposed alignment.

4. APPROCH AND METHEDOLOGY

4.1. Review of Literature, Guidelines, and Previous study

Literatures were reviewed to have some understanding about the ecology and landscape of the road to be upgraded. The literatures include similar ESIA documents and documents which deal about existing policies, environmental guidelines, regulation, environmental proclamations, applicable international conventions and previous studies made on the Country where the project is located.

Key reports, policies and legislations that were reviewed include the Africa Development Bank's Integrated Safeguards System, particularly the Policy Statement and operational Safeguards, (December 2013), Constitution of the Republic of Somaliland, 31st May, 2001. National Environmental Policy, 2015, Somaliland tenure policy, National Water Policy, National Forestry and Wildlife Conservation Low-Act NO. 69/2015, the Coastal and Marine Resources Policy of Somaliland and National Agricultural Strategic Plan.

Other additional documents also include, Polluter pays Principle (PPP), 1974, and Convention on Biological Diversity (CBD) Signed by 150 government leaders at the 1992 Rio Earth Summit, the Convention on Biological Diversity is dedicated to promoting sustainable development. Conceived as a practical tool for translating the principles of Agenda 21 into reality, the Convention recognizes that biological diversity is about more than plants, animals and microorganisms and their ecosystems – it is about people and our need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment in which to live, Article 1, The United Nations Framework Convention on Climate Change (UNFCCC), The Environment (Impact Assessment and Audit) Regulations 2003, The World Commission on Environment and Development, The Rio Declaration, International Guidelines, Agreement, Conventions and Treaties.

The review of relevant documents also informed the development of this ESIA report and assisted the team to have a thorough understanding of the social, economic and environmental situation of the project in relation to the national and regional situation.

4.2. Field Visits

Field visits were made to collect and assess secondary baseline environmental data and information that would be affected by the very presence of the project. These include Land use, economic activities, health, education characteristics and the biodiversity (fauna and flora). Topographic maps, digital camera and a hand held GPS were used to survey the area. Physical observation has been made along the road corridor to acquire primary data of both the physical and biological environment (flora and Fauna).

4.3. Stakeholders Consultation

To acquire social aspects throughout the project corridor, during the field visit consultation were made with various government officials that consist of national level, Regional and district level (town/village level). During the consultation questioners, checklists and interviewing methods have been used to gather official information.

The team ensured that all those that have stakes in the project more especially the communities in the project area were consulted to give their views on the project. Specially designed stakeholder consultation data collection tools (checklist) were developed and used during the stakeholder consultation process. Apart from consultations with national level with the Minstry of Transport and Road Development Agency (MoTRA), the consulting team conducted stakeholder meetings and interviews at Zeyila, Lowyaiddo, Bon (district) and Boroma (Region level), and community levels targeting the executive administrators at village and/or town levels, traditional leaders, villagers in the project area, Business owners, transporters, cross border traders, and many other stakeholders. At community level, the consulting team conducted focus group discussions (FGD) and individuals interview with the identified stakeholders. The list of stakeholders consulted during the assignment is summarized in Annex.

4.4. Method of Impact Prediction and Evaluation

The objective of prediction is to identify the magnitude and other dimensions of identified change in the environment with a project or action, in comparison with the situation without that project or action.

In the case of the Project under consideration, the primary objective of impact prediction and evaluation is to explicitly identify and (qualitatively or quantitatively) determine the nature and magnitude of the impacts resulting from undertaking the Project.

Once impacts have been predicted, there is a need to assess their relative significance. Criteria for significance include the magnitude of the likelihood of the impact and its spatial and temporal extent, the likely degree of the affected environment's recovery the value of the affected environment, the level of public concern and the political repercussions.

When choosing prediction methods, one should be concerned about the appropriateness of the methods for the task involved in the context of available resource. Methods or models for prediction could broadly be classified as explorative and normative approaches.

Explorative methods include: approaches like trend analysis, scenarios, analogies and intuitive forecasting. On the other hand, the normative methods work backwards from desired outcomes to assess whether a project, in its environmental context, is adequate to achieve them.

In the context and framework of the road project under consideration, the explorative method is mainly adopted with combination of trend analysis or forecasting, analogies (transferring experience from other similar projects) and experience and professional judgment of the assessor.

The method of evaluation of impacts can be of various types including simple or complex, formal or informal, quantitative or qualitative, aggregated or disaggregated. The most formal evaluation method is the comparison of likely impacts against legal requirements and standards (like air quality standards, water quality standards, noise levels, etc.). The evaluation of the impacts of the project under consideration will depend on the qualitative, and wherever possible quantitative, approaches to evaluate the extent of the impacts in the short- as well as long-term.

4.5. Mitigation Measures

Mitigation measures are measures envisaged in order to avoid, reduce and, if possible remedy significant adverse impacts that have resulted from implementation of undertakings. Implementation of mitigation measures follow the hierarchy given below:

- Avoid impacts at the source;
- Reduce impacts at source;

- Abate impacts at source;
- Abate impacts at receptor;
- Repair impacts;
- Compensate in kind;
- Compensate by other means; and
- Enhance

Figure 2 below shows the generic trend in nature of an environmental impact in time with and without project.

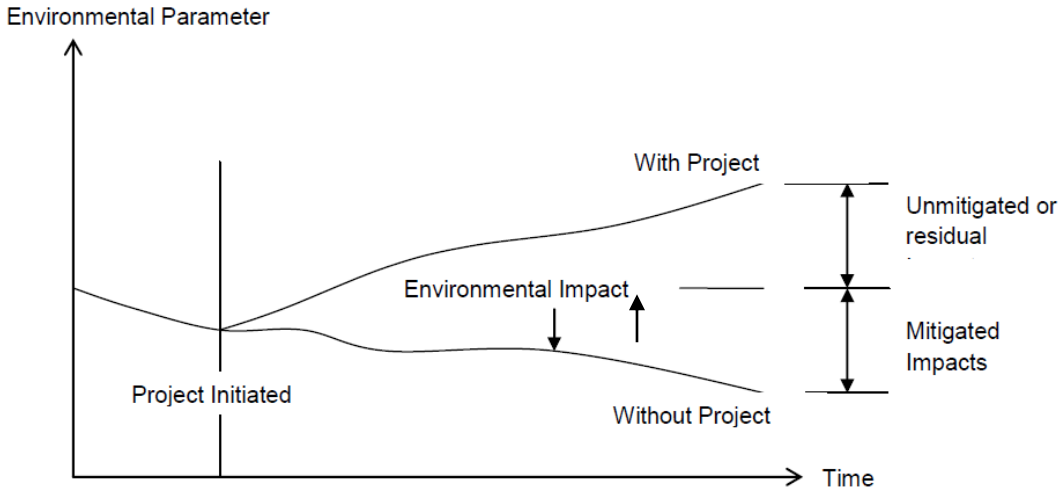


Figure 12 : Nature of an Environmental Impact before and After Project Initiation (After Glasson, 1999)

As shown in Figure 2, even though mitigation measures are applied or implemented properly, there would still be remaining or residual impacts that cannot be mitigated at all. In other words, environmental resources cannot always be replaced; once destroyed, some would be lost forever. That is why the distinction between reversible and irreversible impacts is a very important one, and the irreversible impacts, not susceptible to mitigation, can constitute particular significant impacts in an ESIA.

5. LEGAL, REGULATORY AND INSTITUTIONAL CONSIDERATIONS

5.1. General framework

The Republic of Somaliland through the Ministry of Parliamentary relations and Constitutional affairs has approved and proclaimed to the whole world since 31st May, 2001. Therefore the current fundamental policy framework is based on this constitution.

Policies and legislation developed under the Government of Somaliland in Hargeissa were gradually replaced and renewed by the same. However, most are now in draft, final consultation and approval phase and have draft status as indicated below. Currently enforcement of environmental regulations and ESIA procedures follow the procedures of respective development partner and the Country's Environment policy. Most sectoral policies within the field of natural resources management are very sector-oriented given that they are regarded only from the perspective of how they interact with each sector, instead of being considered as a common asset to be managed by the sectors jointly to achieve a wise, fair and sustainable development of the country's wealth for all. As a result, each sector devolves a part or all the cost of its development to other sectors.

5.1.1. Institutional Framework

Somaliland has four administrative levels, namely: (1) national level, (2) Region, (3) District, (4) Community or village, all of which will play pivotal roles during the construction and operation of the road project. At the national and state level ministries are established, and below that the administrations have departments or units for the various sectors. Ministries directly involved in sectors such as Agriculture Development, Water, Livestock and fisheries, forestry, wildlife, are directly responsible for natural resources management. Ministries responsible for finance, rural development, physical planning, Petroleum and mining and health and road infrastructure play a facilitating role in assuring effective management of natural resources and the environment. Those responsible for raising awareness on importance of protecting the environment and sustainable development include the ministries in charge of education; communication/ Information; gender, culture and youth; and local Government.

5.1.2. The Constitution of Somaliland

Somaliland has been functioning as an independent state since 1991 despite the lack of international recognition. In pursuance of the resolutions of the Conference of the Somaliland Communities held in Burao on 27th April to 5th May 1991, which reaffirmed (their) independence with effect from 18th May 1991; and noting that the Conference of the Elders of the Somaliland Communities held in Borama from 24th January to 25th May 1993 adopted a National Charter which: the Republic of Somaliland has laid down that a national constitution which will replace the national charter be prepared and consulted upon within a year; and set out clearly the constitutional principles and the governmental structures, confident in their communities' inalienable right to decide their destiny. Therefore cognizing the major reasons of paramount importance Country level through judicial procedures including National beliefs and cultural aspirations and through participation of all stakeholders; the people of Somaliland approved and proclaimed to the whole world on this 31st May, 2001, that this constitution has been adopted as the nation's Constitution.

The Constitution contains provisions related to land as a national property and establishes the state responsibility for the land and natural resources. Article 12 says, "The land is a public property commonly owned by the nation, and the state is responsible for it12", and shall take all possible steps to explore and exploit the natural resources which are available in the nation's land or sea. The protection and the best means of the exploitation of these natural resources shall be determined by law.

Article 31of the Constitution recognizes that every person has the right to own private property, if it is acquired lawfully, and that such property may not be expropriated except for reasons of public interests in the exchange of proper compensation. The private property ownership includes land in which Art. 2(1) of Law No. 8/1999, and 19(a) of Law No. 17 established private ownership of land with the title deed.

Part Two General Principles, Article 12: Public Assets, Natural Resources and Indigenous Production. According to this article of the Constitution;

1. The land is a public property commonly owned by the nation, and the state is responsible for it.
2. The care and safeguarding of property, endowments and public assets is the responsibility of the state and all citizens; and shall be determined by law.

3. The Government shall have the power to own and possess movable and immovable property; and to purchase, sell, rent, lease, exchange on equivalent value, or otherwise expend that property in any way which is in accordance with the law
4. The central state (government) is responsible for the natural resources of the country, and shall take all possible steps to explore and exploit all these resources which are available in the nation's land or sea. The protection and the best means of the exploitation of these natural resources shall be determined by law.
5. Where it is necessary to transfer the ownership or the benefits of a public asset, the transfer shall be effected in accordance with the law.
6. The state shall encourage indigenous economic production such as agriculture, livestock, fisheries, minerals, production of frankincense and myrrh and gum etc., and manufacture based on indigenous products.
7. The payment of Zakat is a cornerstone of Islam, and its administration shall be determined by law.

Part Two General Principles, Article 18 describes also about: Environment and Disaster Relief encompassing the following

1. The state shall give a special priority to the protection and safeguarding of the environment, which is essential for the well-being of the society, and to the care of the natural resources. Therefore, the care of and (the combating of) the damage to the environment shall be determined by law.

2. The state shall undertake relief in disasters such as famine, storms, epidemics, earthquakes, and war

Article 19: The Care of the Vulnerable of the Society

The state shall be responsible for the health, care, development and education of the mother, the child, the disabled who have no one to care for them, and the mentally handicapped persons who are not able and have no one to care for them

Article 20: Work, Trade, and the Welfare of Employees

1. All able citizens have a right and a duty to work. The state shall, therefore, be responsible for the creation of work and the facilitating of the skills training of employees.

2. The conditions of work of the young and women, night working and working establishments shall be regulated by the Labor Law.

3. All employees have a right to payment appropriate to the work they undertake, and are free to enter into agreements with their employers on an individual or collective basis. Forced labour is prohibited.

4. The state shall endeavor to create understanding and clear rights between employees and employers and shall accordingly introduce a law (in this respect).

5. State employees and members of the armed forces shall be entitled remuneration, pension and to payments for sickness, injury, or disability in accordance with the law.

6. The state shall promote the support systems, insurance and safety of employees and shall strengthen the relevant responsible bodies.

Article 31: The Right to Own Private Property

1. Every person shall have the right to own private property, provided that it is acquired lawfully.
2. Private property acquired lawfully shall not be expropriated except for reasons of public interest and provided that proper compensation is paid.
3. The law shall determine matters that are within the public interest, which may bring about the expropriation of private property.

In Article 34 it states that:

"Every citizen shall have the duty to care for, protect and save the environment".

5.1.3. National Environment Policy, 2015

The Ministry of Environment and Rural Development has developed a National Environmental Policy. The overall vision of the National Policy on Environment is to provide a framework management guide for the management of Somaliland's environment and natural resources so as to ensure that they are managed

on sustainable basis and retain their integrity to support the needs of the current and future generation without compromising either of the two.

The National Policy incorporates a clear set of Objectives, Guiding Principles and Strategies that will bind all organizations and individuals to exercise due care to avoid depletion of natural assets and environmental degradation.

The Constitution of the Republic of Somaliland enshrines matters that relate to the environment and natural resource management thus providing the keystone to the National Policy on Environment. Article 18 of the Constitution affirms that:

"*The state shall give a special priority to the protection and safeguarding of the environment, which is essential for the wellbeing of the society, and to the care of the natural resources. Therefore, the care of and (the combating of) the damage to the environment shall be determined by law".*

In Article 34 it states that:

"Every citizen shall have the duty to care for, protect and save the environment".

The National Policy on Environment recognizes the requirements set out in the Constitution and acknowledges the responsibility of civil society and all citizens to protect and conserve the environment and all its resources and to manage the environment in all its aspects to fulfill these obligations.

The National Policy on Environment underlines the commitment of government, in partnership with the people, effectively to manage the environment for the benefit of present and future generations. The aim of this Policy is to ensure sound environmental management within a framework of sustainable development in Somaliland. The Policy is supported by many other policies and strategies developed for other sectors and it now provides a holistic approach, following Millennium Development Goals, to establish a national strategy based upon cross-sectoral consensus for care for the environment.

The Policy emphasizes that it is the duty of any institution, government or non-governmental organization, any community group or people's organization or any individual that uses or otherwise carries out activities that affect the environment in any way, to exercise proper control to maintain the

productivity and integrity of the environment. The Policy is set against a background that includes macroeconomic issues, the Millennium Development Goals, and National Poverty Reduction Strategy and it considers economic incentives for improved environmental management.

Under Macro-economic Policy Issues

The Reconstruction and development Program (RDP), which is the current development framework, was prepared through participatory planning process by all stakeholders. The RDP is the product of the combination of the Interim Strategic Note, United Nations Transitional Plan (UNTP) for 2008-2010, and the EC and Norway Country Strategic Paper; and integrated with the local development input from the recommendations drawn by the national and international development experts. The RDP development vision is deepening peace and poverty reduction; and has three development pillars, which further grouped into ten development sectors, namely- governance, education, health, water and sanitation, livelihood, infrastructure, private sector, ICT, emergency and recovery and religion.

The Millennium Development Goals

Whilst the eight UN Millennium Development Goals define the main areas of global concern that affect development objectives and related activities, the two that are of the greatest importance to the National Policy on Environment are Goal No 1,"Eradicate extreme poverty and hunger" and Goal No 7, take measures to "Ensure environmental sustainability".

In particular, using the Millennium Development Goals as a guideline, the National Policy on Environment covers the socio-economic and environmental issues that affect ecosystems as follows:

- Protection of the Nation's current asset base.
- Improvement and possible expansion of the asset base.
- Introduction of cross-sectoral approaches for co-management with communities.
- Development of mechanisms for re-investment and revenue sharing with the poor.
- Promotion of infrastructure and technology development without damaging the environment.

- Identify and prioritize impoverished areas and develop compensatory mechanisms and incentives for rehabilitation.
- Introduce effective environmental information, education and communication nation-wide.
- Targets set will be greatly facilitated for Somaliland through successful implementation of the National Policy on Environment. Generally, all targets of the MDGs are linked to sustainable environmental management.
- Specifically, the targets under Goal 1 and Goal 7 have more direct linkages to sustainable environmental management. The targets are:
- **Goal 1:** Target 1 - Halve, between 1990 and 2015, the proportion of people whose income is less than $1 a day.

Target 2 - Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

Target 10 - Halve, by 2015, the proportion of people without access to safe drinking water and basic sanitation.

Target 11 - Have achieved by 2020 a significant improvement in the lives of at least 100 million slum dwellers.

The national strategy is to reduce poverty by reviving Somaliland's economy. As far as possible this growth should be broad-based, thereby promoting income-generation, linkages and equity. Enhanced pastoral and agricultural productivity is given the highest priority since it combines the virtues of growth and equity. The strategy also includes programs for Industry, Tourism, Heritage, Mining, Education, Health, Water and Sanitation, Energy, Transport, Communications and Roads and further recognizes the importance of cross-cutting issues including Environment, Gender and HIV/AIDS, and Health.

5.1.4. Somaliland's Environment Management Low No 79/2018

The Republic of Somaliland with its Environmental matters sector representative, Ministry of Environment has approved an Environmental Management Lo No 79/2018. This low expresses the will of the government through its Ministry the rules and responsibilities which must be considered by any actor of the sector as the directive framework in every development endeavor requiring Environmental impact Assessment studies. The low besides describing the general principles and administration matters it

dowels well on the environmental planning issues both at National and District levels which is so important for developmental projects like Lowyaddo-Farddha-Borama Road project.

The low stressfully explains the role and mandatory and regulatory issues of Environmental Impact Assessment (EIA) of developmental projects while conducting EIA in the Democratic Republic of Somali land. Under Part 5 Environmental Impact Assessment of this low (Article 11-17) encompasses fiscal incentives, application for an Environmental Impact Assessment, publication of Environmental Impact assessment, Submission of fresh EIA report after Environmental Impact assessment License, Transfer of EIA license, Protection in respect of a license and revocation and cancelation of license.

Furthermore the low explains about

Part 6 (Article 6-7) refers to Environmental Audit and Environmental Monitoring

Part 7 (Article 8-54) refers to Environmental Quality Standards

Part 8 (Article55-63) states about Environment restoration and Easement orders

Part 9 (Article 64-66) states Analysis and recording

Part 10 (Article 67) refers about Convention, agreements and treaties on environment

Part 11 (Article 68) states competent part for environmental matters

Part 12 (Article 69-81) states about Environmental offences

5.1.5. National Water Policy

The Republic of Somaliland with its water sector representative, Ministry of Mining, Energy and Water Resources has approved a National Water Policy on the 22nd of June 2004. The National Water Policy expresses the will of the government for the development of the water sector, and must be considered by any actor of the sector as the directive framework for their actions. Any action undertook in the water sector in Somaliland must comply with this policy and the rest of the regulatory framework developed for the sector.

This policy is the first element constituting the global regulatory framework for the water sector. These elements are: the National Water Policy, the National Water Strategy, the Water Act and the Water Regulations

Main goal of the water sector development: to improve availability and access to water in a sustainable and equitable way for all different types of uses, in a manner that is environmentally safe.

The Policy also promotes cross-cutting principles that may serve one or several of the previous objectives. Among these principles also provide general guidance for any actor when preparing its intervention includes: equitable water use, environmental sustainability, local management, private sector participation, gender approach and decentralization.

According to this policy, surface water is a complementary resource that can help reduce the pressure on groundwater resources. The lower level of quality of this resource makes it more suitable for non-domestic applications, such as: Livestock watering, Agriculture irrigation, House cleaning, Industrial production (except for drinking purposes), Sanitation. Ponds, dams, ballehs and berkads are the main technologies in use for harnessing surface water. The key policy principles for development and utilization of surface water resources ware as follows:

- The promotion of the construction and rehabilitation of ballehs and berkads by other actors than government agencies.
- The co-ordination at central level of the planning of such infrastructure to avoid concentration and risk of conflicts.
- The utilization of such water for domestic purposes must be guided by safe public health practices (treatment, transportation, preservation) to limit the risk of waterborne diseases.

5.1.6. Somaliland Tenure Policy

The Constitution contains provisions related to land as a national property and establishes the state responsibility for the land and natural resources. Article 12 says, “The land is a public property commonly owned by the nation, and the state is responsible for it12”, and shall take all possible steps to explore and exploit the natural resources which are available in the nation’s land or sea. The protection and the best means of the exploitation of these natural resources shall be determined by law.

Article 31of the Constitution recognizes that every person has the right to own private property, if it is acquired lawfully, and that such property may not be expropriated except for reasons of public interests in

the exchange of proper compensation. The private property ownership includes land in which Art. 2(1) of Law No. 8/1999, and 19(a) of Law No.17 established private ownership of land with the title deed. 12 Official versions to refer is the Somali and it has same meaning as in this English version (Somalilandlaw.com)

Under the constitution, people have equal rights and obligations before the law, and shall not be discriminated on the grounds of clan, birth, gender, property, status or opinion (Art. 8).

Article 36 of the Constitution recognizes that women and men enjoy equally the rights, freedoms and duties laid down in the Constitution, “save for matters which are specifically ordained in Islamic Sharia”. It further provides that the government shall encourage and legislate for “the right for women to be free of practices which are contrary to sharia and which are injurious to their personality and dignity”; women have the right to “own, manage, oversee, trade in or pass on property in accordance with the law”. In light of this, women can legally own and control land but there are many cases in which customary rules prevail over statutory law, especially in rural areas where traditional social systems discriminate against women and impede them from owning and controlling land. This constitutional principle for women’s rights need to be interpreted into practice and mainstreamed into programs within the public sector delivery of services.

There are several legislative instruments that have been adopted to govern specific sectors related to land. Prominent among them are the Agricultural land ownership Law No. 8/1999 and Urban land management law No. 17/2001. There are also other laws on mining, livestock, water and environment that are relevant to land governance.

Apart from the Somaliland land tenure Policy an analysis of Legal Issues Related to Land in Somaliland (Final Draft Report April 2016) has been reviewed as it has a number of amendments of the previous land tenure documents. According to this document Article 8 of Law No. 8/1999 provides that if agricultural land is nationalized for public use, the state has to pay compensation to the previous owner within three months. The law does not specify the remedial procedures to be followed in order to ensure fair compensation is received by the previous owners. Urban land may similarly be expropriated for public purpose subject to compensation to owners. Under Art. 1 and 6 of law No. 17, the President of Somaliland has the authority to issue decree transferring land for the public interest or town re-planning after consulting with the Cabinet and the National Urban Land Planning Committee. Public interest means

the use of land for the construction of new roads, extension of existing roads, bridges, electrical and communication lines, offices and government buildings and any other reason deemed necessary. The presidential decree will be circulated through official channels. The National Land Planning Committee is responsible for the evaluation of the costs and payment of the compensation for the properties affected by the re-planning, and an owner shall also receive a plot that is equal, in terms of size and location, to the plot that is expropriated.

As mentioned above, under Art. 12 of the Constitution, the state is responsible for land administration, but this part will examine how the administration is delegated to different authorities including Ministries and local authorities.

According to Art. 3 of Law No. 08/99, the Minister of Agriculture is responsible for the administration of agricultural land on behalf of the government, and at the same time, the Ministry issues title deeds and makes registration of farms.

On the other hand, Law No. 17/2001 established the National Urban Land Planning committee21 which is responsible for urban planning, approval of master plans and extension of towns. The Committee is comprised of six Ministries including Minsters of agriculture and rural development and the Minster of Public

The lack of a comprehensive land policy, the desperate and to some extent inconsistent legal frameworks and weak institutional governance in land administration has shifted public trust from the public institutions to the clan system where communities feel their land is more secure through clan protection. For instance, elders have assumed crucial decision-making powers in land disputes. Sometimes, the police and judicial institutions redirect critical land cases to elder's for the later to pass final judgments that are often enforced. However, even the decisions of elders may be rejected by a losing party and this can lead to unresolved clan disputes, especially among pastoral and agro pastoral communities where clashes over scarce resources lead to conflicts that are difficult to prevent or resolve.

5.1.7. National Forestry and Wildlife Conservation Low-Act No. 69/2015

The annotated translation of this law was developed with the goal of facilitating understanding and practice of the law by non-native Somali speakers who may not be knowledgeable about the context or

history of conservation in Somaliland, and in particular by persons and organization with an interest in wildlife conservation. The law was developed in 2015, gazetted in 2016.

According to this low, the Somali *duurjoog* is translated as wildlife, and *duur* means in various instances wildlife as well as forest. This implies that, as per standard international definitions, the concept of wildlife pertains to both flora and fauna. However, in this law, wildlife is used most frequently in reference to animals (especially vertebrates), while other language is used in reference to plant life. Indeed, separate articles lay out the law and consequences of illegal action for the land (plant) resources versus animals.

This low also encompasses:

Wildlife Trafficking:

Include **of animals**: Articles 18 (clauses 8-13), 19, 21, 27, and 31, **of plants**: Article 31 and **of charcoal** (deforestation): Article 11, Clause 7.

Environmental democracy:

- **Public participation**: Article 3 (clauses 4-5), Article 10 (clauses 1 and 3), Article 11 (clauses 2 and 4), Article 14 (clause 3), Article 16 (clauses 2e and 2g)
- **Citizen justice**: Article 18 (clauses 6-7), Article 25 (clauses 1 and -7), Article 26 (clause 1), Article 30 (clause 2)

***Forest and grazing reserves**:* Article 3 (clauses 7-8), Article 8 (clause 5), Articles 12-14

Commerce: Article 7 (clause 2); Article 9, Article 11 (clause 7), Article 15, Article 18 (clause 3), Article 21

Alternative Ennery: Article 3 (clauses 10-11), Article 11, Article 16 (clause H)

The low contains prime catégories and penalties and the Ministry of Environment and Rural Development shall be responsible for implementing this act. The Ministry shall:

1. Carry out monitoring and census activities of plant and wildlife resources.

2. Carry out, once every three years, a census on the natural resources of the country, subsequently preparing a written report. The report and the findings of the census should be published by the Ministry.
3. Improve the capacity of the staff and others assigned to preserve forests and wildlife, so that they can accurately fullfill their duties as described in this act.
4. Organize a national awareness campaign to engage different segements of society
5. Develop forestation programs (projects) with the participation of individuals, communities, and organizations interested in planting trees and grasses.
6. Report on endangered plants and wildlife and develop conservation and preservation programs.
7. Create and manage protected areas
8. Improve the establishment and management of private and public forests.
9. Provide licenses for managing tree resources in accordance with this act.
10. Be responsible for carrying out research on environmentally-sound alternative energy sources.
11. Seek alternative energy sources to replace charcoal.
12. Establish forest and wildlife guards for the enforcement of this act.
13. Collaborate with other ministries, NGOs, and others interested in improving the education and equipment of environment and wildlife guards.

This low explains the legal establishment and the duties and responsibilities of the Environment Conservation Committees at National, Regional, District and Village levels.

Very important chapters and articles stated under Act No.69/2015 spesfically indicated as below

Chapter 3 of this low states the protection of forests, trees, grazing lands **and fences**

Chapter 4 states Private and Public Forests which encompasses the Creation and Management of Private and Public Forests as well as Alternative Energy Source Development

Chapter 5 states about reserve, creation of new reserve, type of reserve and their demarcations and management and protection of reserves

Chapter 6 states about wild life conservation, exporting and importing wild life animals

Chapter 7 under Exemptions and Permits for Wildlifeas for example Predators, Birds and Turtles Article 21 describes that:

1. It is forbidden to hunt, trade, and export wildlifeas for example predators, birds, and turtles inhabiting Somaliland.
2. It is forbidden to issue permits legalizing hunting, trading, or exporting wildlifeas for example predators, birds, and turtles living (inhabiting) inside Somaliland.

5.1.8. The Coastal and Marine Resource Policy of Somaliland

On September 1995, Somaliland Law on Fisheries was promulgated to deal with jurisdiction of the Somaliland maritime zone, resources management, licensing and penalties. To strengthen the Law on Fisheries, the Coastal and Marine Resource Policy of Somaliland was approved at the end of 2000. The Policy provides a clear vision on resource development and the conservation of biodiversity. The following is the specific principles and objectives stipulated in the Policy:

a. Optimizing the long-term social and economic benefits from the coastal and marine environment for Somaliland and its people;

b. Protecting the rich biodiversity of Somaliland's marine and coastal environments for present and future generations;

c. Adopting responsible fisheries practices so as to ensure sustainable use of living marine resources;

d. Coordinating coastal and marine resource use and planning, at a national level;

e. Promoting fair, equitable and transparent governance over marine and coastal resources;

f. Meeting international and regional obligations to marine and coastal matters;

g. Allocating central budgets for fisheries development.

h. Developing partnerships with stakeholders, communities and local authorities to achieve optimal management of resources.

5.1.9. The National Agricultural Strategic Plan (NASP)

The National Agriculture Strategic Plan (NASP) This strategic agriculture sector plan (2021-2023) is initiated by the MOAD with the support of the Ox-farm and its formulation is undertaken by a national consultant along with participation and contributions of four technical experts from the MOAD. Meanwhile, considerations are given to the agricultural activities associated with their challenges while the current as well as potential capacity of the sector was analyzed. In view of this, priorities were set including goals, intermediate objectives and major interventions intended to achieve those goals. The intension was to frame a forum along which resources are pooled and sector development interventions are coordinated and controlled in the coming three years.

The overall objective of the Strategic Plan is to achieve an improved livelihood for the agricultural communities and increased domestic supply of food through an efficient and sustainable exploitation of research with a view to an enhanced contribution of the agricultural sector to the national economic development: The specific objectives includes:

- To identity constraints and challenges to Somaliland agricultural development
- To review organizational structure and core functions of the Ministry of Agricultural development to ensure effective service delivery to the sector.
- To define goals, intermediate objectives and interventions towards sector development.
- To define a sector coordination mechanism that facilitates effective and efficient utilization and management of the sector's development resources.

5.2. Polluter Pay Principle (PPP), 1974

The Polluter Pays Principle (PPP) is an environmental policy principle which requires that the costs of pollution be borne by those who cause it. In its original emergence the Polluter Pays Principle aims at determining how the costs of pollution prevention and control must be allocated: the polluter must pay. Its immediate goal is that of internalizing the environmental externalities of economic activities, so that the prices of goods and services fully reflect the costs of production. Bugge (1996) has identified four versions of the PPP: economically, it promotes efficiency; legally, it promotes justice; it promotes

harmonization of international environmental policies; it defines how to allocate costs within a State. The normative scope of the PPP has evolved over time to include also accidental pollution prevention, control and clean-up costs, in what is referred to as *extended Polluter Pays Principle*. Today the Principle is a generally recognized principle of International Environmental Law, and it is a fundamental principle of environmental policy of both the Organization for Economic Co-operation and Development (OECD) and the European Community.

5.3. Convention of Biological Diversity (CBD), Article 1

The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding." This means these resources should be preserved for future use in this country; it must not be destroyed where they are. Signed by 150 government leaders at the 1992 Rio Earth Summit, the Convention on Biological Diversity is dedicated to promoting sustainable development. Conceived as a practical tool for translating the principles of Agenda 21 into reality, the Convention recognizes that biological diversity is about more than plants, animals and microorganisms and their ecosystems – it is about people and our need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment in which At Rio conference in 1992, this convention was signed by 150 countries. Convention recognizes that biological diversity is about more than plants, animals and microorganisms and their ecosystems – it is about people and our need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment in which to live, the conference recognize Biological Diversity as more than plants, animals, and microorganisms, and their ecosystems, it is about people's needs for food security, medicine, fresh air, water, shelter, and clean and healthy environment which they live in.

5.4. Proclamation on Conservation, Development and Utilization of Forest

The most recent legislation is the proclamation of on conservation, development and utilization of forest and it was issued in 1994 (ProclamationNo.94/1994) to provide for the conservation, development and utilization of forests. The objective of this proclamation is to provide basis for sustainable utilization of the

country's forest resources. The proclamation categorises types of forest ownership (State, Region, and private forest). It provides the power of designation, demarcation, and registration of forest to the Ministry of Agriculture and Regional Governments. According to this proclamation, state and regional forests shall be utilised in accordance with approved management plans. The Proclamation then goes on to give some specific direction for the utilization of Stat and Regional forests, and prohibited activities within protected forests.

5.5. The United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC, signed at Rio de Janeiro in June 1992 by some 155 states, is loosely modeled on the 1985 Vienna Convention. As its name suggests, it provides a framework within which more detailed obligations will be negotiated by the means of detailed protocols. The basic objective of the Convention is to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous anthropogenic interference with the climate system in a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure food production is not threatened and to enable economic development to proceed in a sustainable manner. (Article2). Two primary duties are imposed on all Parties by Article 4: (a) to develop, periodically update, publish and make available a national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases using comparable (and yet to be agreed upon) methodologies; and (b) to formulate, implement, publish and regularly update national and regional programs of measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases and measures to facilitate adequate adaptation to climate change. In addition developed country parties agree to a number of general obligations which will be made specific by more detailed protocols.

5.6. The World Commission on Environment and development

The Commission commonly referred to as "the Brutland Commission" focused on the environmental aspects of development, in particular, the emphasis on sustainable development that produces no lasting damage to biosphere, and to particular ecosystems. In addition, environmental sustainability is the economic and social sustainability. Economic sustainable development is development for which progress towards environmental and social sustainability occurs within available financial resources. While social sustainable development maintains the cohesion of a society and its ability to help its

members work together to achieve common goals, while at the same time meeting individual needs for health and well-being, adequate nutrition, and shelter, cultural expression and political involvement.

5.7. The Rio Declaration

Agenda 21–a program of action for sustainable development worldwide, the Rio Declaration on Environment and Development was adopted by more than 178 governments at the United Nations Conference on Environment and Development, known as the Earth Summit, held in Rio de Janeiro, Brazil from 3rd to 14th June 1992. Principle No. 10 of the declaration underscore that environmental issues are best handled with participation of all concerned citizens at all the relevant levels. At the national level, each individual shall have appropriate access to information that is concerning environment that is held by public authorities. States shall encourage and facilitate public participation by making information widely available.

5.8. International Guidelines, Agreement, Conventions and Treaties

There is no clear information whether the Republic of Somaliland is signatory to various international guidelines, agreements, conventions and treaties that have environmental implications/provisions and as such cannot be contravened during project development phases. The Environmental Assessment Expert must consider the provisions of these guidelines, agreements, conventions and treaties when carrying out ESIA/EA studies. Some international guidelines, agreements, conventions and treaties have provisions, which are generally respected in the republic of Somaliland. They include:

- The Convention on Trade in Endangered Species (CITES)
- The Ramsar Convention on Wetlands of International importance especially as Waterfowl Habitat.
- The Convention on Biodiversity (1992)
- The United Nations Framework Convention on Climate Change (1992)
- The convention concerning the protection of workers against occupational hazards in the working environment.
- The Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes (1989).

- The World Bank Operational Directives 4.01 and Environmental Assessment Source Book Volume Highway Design Code
- World Health Organization Air Quality and Emissions Guidelines
- World Health Organization Drinking Water Quality Guidelines (1993)
- World Health Organization Environmental Guidelines and standards for industrial Discharge (1983)

5.9. Africa Development Bank Policy

5.9.1. Integrated Safeguard Policy Statement

The African Development Bank (AfDB or the Bank) is committed to making growth inclusive by broadening access to economic opportunities for more people, countries and regions, while protecting the most vulnerable. The Bank further recognizes that human well-being in Africa depends on the quality of the environment and the sustainable use of natural resources. This is why it strives to ensure that Bank operations have no unintended adverse direct or indirect environmental or social impact on communities. The policy statement draws from applicable safeguards and other relevant cross-cutting and sectoral policies of the Bank. It aims to establish the objectives and scope of the ISS.

The commitments and responsibilities of the policy majorly include:

- Systematic assessment of impacts and risks
- Application of safeguards to the entire portfolio
- Support to clients and countries
- Proportionality and adaptive management
- Transparency, good governance and inclusivity
- Protecting the most vulnerable
- Promoting gender equality and poverty reduction
- Harmonization and facilitation of donor co-ordination
- Compliance monitoring and supervision of safeguards
- The Bank's grievance and redress mechanism
- Incorporating climate change into development efforts

Climate variability and change has emerged as a major challenge to development efforts, with a high risk that it could undermine past and complicate ongoing development efforts, increase social problems, and threaten environmental sustainability. The interaction of development interventions with the physical and ecological environment may result in such unintended consequences as loss or degradation of natural and cultural resources and assets and biodiversity; unsustainable production and consumption, in particular, of energy; and increased vulnerability to climate change and climate variability. Therefore, the Bank requires an assessment of vulnerability to climate change as part of the environmental and social assessment process for its public and private sector operations; any mitigating measures that result from that assessment are included in the operation with measures that result from the larger environmental and social assessment itself.

5.9.2. Bank's Operational Safeguard

Operational safeguard 1 – Environmental and social assessment Objectives

The objective of this overarching Operational Safeguard (OS), along with the OSs that support it, is to mainstream environmental and social considerations—including those related to climate change vulnerability—into Bank operations and thereby contribute to sustainable development in the region.
The specific objectives are to:

• Mainstream environmental, climate change, and social considerations into Country Strategy Papers (CSPs) and Regional Integration Strategy Papers (RISPs);
• Identify and assess the environmental and social impacts and risks— including those related to gender, climate change and vulnerability—of Bank lending and grant-financed operations in their areas of influence;

• Avoid or, if avoidance is not possible, minimize, mitigate and compensate for adverse impacts on the environment and on affected communities;

• Provide for stakeholders' participation during the consultation process so that affected communities and stakeholders have timely access to information in suitable forms about Bank operations, and are consulted meaningfully about issues that may affect them;

• Ensure the effective management of environmental and social risks in projects during and after implementation; and Contribute to strengthening regional member country (RMC) systems for environmental and social risk management by assessing and building their capacity to meet AfDB requirements set out in the Integrated Safeguards System (ISS).

The environmental and social assessment covers all relevant direct and indirect cumulative and associated facility impacts identified during the scoping phase, including any specifically covered in OSs 2-5, for which there are specific requirements:

Operational safeguard 2 Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation-

This Operational Safeguard (OS) aims to facilitate the operationalization of the Bank's 2003 Involuntary Resettlement Policy in the context of the requirements of OS1 and thereby mainstream resettlement considerations into Bank operations.

Operational safeguard 3 – Biodiversity, renewable resources and ecosystem services

This Operational Safeguard (OS) outlines the requirements for borrowers or clients to (i) identify and implement opportunities to conserve and sustainably use biodiversity and natural habitats, and (ii) observe, implement, and respond to requirements for the conservation and sustainable management of priority ecosystem services.

Operational safeguard 4 – Pollution prevention and control, hazardous materials and resource efficiency

This OS outlines the main pollution prevention and control requirements for borrowers or clients to achieve high quality environmental performance, and efficient and sustainable use of natural resources, over the life of a project.

Operational safeguard 5–Labor conditions, health and safety

Labor is one of a country's most important assets in the pursuit of poverty reduction and economic growth. The respect of workers' rights is one of the keystones for developing a strong and productive workforce. This OS outlines the main requirements for borrowers or clients to protect the rights of workers and provide for their basic needs.

5.10. Relevant International Conventions

When implemented the project will produce environmentally friendly road project and which will have a great contribution towards building a resilient economy by reduction of GHG emission through reduction of gas emission from trucks and vehicles, tree planting and facilitating the import and export exchange of the country , therefore, acknowledging some international conventions is appropriate. Somaliland has ratified the following international conventions on natural resources and environmental management:

- Framework Convention on Climate Change (ratified through Proclamation No. 97/1994).
- Convention on Biological Diversity (ratified through Proclamation No. 98/1994).
- The United Nations Convention to Combat Desertification (ratified through Proclamation No. 80/1997).
- The Cartagena Protocol on Bio-Safety to the Convention on Biological Diversity (ratified through Proclamation No. 362/2003).

The Ministry of Environment is designated as the focal point for the implementation of the above conventions.

6. ANALYSIS OF ALTERNATIVES

This Section presents a discussion on the various alternatives considered during project planning, design, construction and operation as well as reasons for the selection of the preferred alternative chosen. A systematic comparison of feasible project alternatives, in terms of both the project (i.e., technology, design, operation, etc.) and site selection is provided. The assessment of project alternatives and site selection includes environmental, and social factors and includes the no-go (i.e. the situation if the project were not developed) scenario. Four alternatives were reviewed with respect to geometry, length and the effect with respect to the environment was reviewed in the draft feasibility report.

6.1. Analysis of Alternative Routes

On the Lowyaddo-Borama road project assessment of project alternatives and site selection has been made which includes environmental, and social factors and the “no project scenario” (i.e. the situation if the project were not developed) scenario. Four alternatives were reviewed with respect to geometry, length and the effect with respect to the environment and social aspects. Three alternatives excluding “no-go scenario” were evaluated based on socio-environmental criteria to select the best alternative route which is socio environmentally feasible. The four alternatives were:

Route	Description	
R1	Lowyaddo-Berisile-Tokosh-Zeyila-Ashado-Ealgale-Garis-Hogferes-Farddaha-Areweren-Ferdihun-Werar-Degahmedo-Halemale-Bon-Quljet–Borama =**256km**	Consultants Proposal; the route touching Zeyila (transecting Brisile-Tokosh-Zeyila-Ashado), reasonably accessible as it runs on the flat land of coastal plain.
R2	Lowyaddo-Berisile-Ashado-Ealgale-Garis-Hogferes-Farddaha-Areweren-Ferdihun-Werar-Degahmedo-Halemale-Bon-Quljet – Borama= **246km**	Existing Route, Straight, Reasonably wide, no ROW impact; does not require new encroachment, accessible
R3	Lowyaddo-Berisile-Ealgale-Garis-Hogferes-Farddaha-Areweren-Ferdihun-	Consultants Proposal; the route transecting Addad and Badambel villages but missing

Route	Description	
	Werar- Borama.=**230km**	Jirjir, Quljet, Bon, Halemale and Degahamedo villages of the existing route. Route running on difficult terrain (mountainous and escarpment), hardly accessible.
R4	Lowyaddo-Berisile-Ashado-Ealgale-Garisa-Hogferes-Ferddha-Areworen-Ferdihun-Werar-Degahmedo-Halemale-Bon-Quljet–Borama+ Tokosh-Zeyila (21.4 km spur)= **263 km**	Existing route and Tokosh-Zeyila (21.4 km spur) connection

6.1.1. "Do-Nothing "Scenario"

From neutral physical environment point of view the "Do-nothing" alternative might appear preferable to some degree despite certain natural processes are already taking place altering pristine condition of the existing environment even without human involvement such as the effect of climate change and naturally caused disasters etc. However, if the condition of the road continues as is now; the potential socio-economic development of the area , market exchange, investment opportunities and access to different infrastructure will face with a tremendous number of quality, economic and safety problems.

On the other hand the **'No-go"** alternative means that the project will not be developed and Somaliland will continue to rely on other routes to meet its future needs and will be mostly dependent on world high cost means of transportation. Somaliland has abundant natural resources which require proper and standard road network system. This single source alternative if not utilized will continue to sustain dependence on other routes/transportation network, but that could also very easily result in poor transportation system as well as poor economic development of the country. Having observed the project

location, the 'Do-Nothing" scenario is not recommended for it has immense potential impact for development without affecting the environment adversely.

6.1.2. Environmental Assessment

The alternative routes are compared using selected environmental parameters as indicated in the table below. The evaluation is made by assigning numerical weightages, and as described in Ethiopian Roads Authority ERA Quality Manual for route selection but with minor adjustments.

Table 9: Multi Criteria Analysis for Environmental Impacts

No	Description of Environmental Issues	ECA value	Alternative Route							
			Option-1		Option-2		Option-3		Option-4	
			Risk Level	Aggregate Impact	Risk Level	Aggregate Impact	Risk Level	Aggregate Imnact	Risk Level	Aggregate Impact
1	National Parks, primary Forest, Areas of High biodiversity and Endangered species	5	2	10	2.5	12.5	3	15	2.5	12.5
2	Recharge Areas for Aquifers, Protected Water Bodies and Wetlands	4	2	8	2	8	2	8	2.5	10
3	Prime agricultural - land	3	1	3	1	3	1.5	4.5	1	3

4	Area of high landscape values/Scientific interest	2	0	0	0	0	0	0	0	0
5	Areas prone to erosion	1	0.5	0.5	0.5	0.5	1	1	0.5	0.5
6	Total ECA Risk value			21.5		24		28.5		26
7	MCA score out of 20			14.65		14		12.88		13.5

Note: risk level: 0 = None, 1=low, 2=Moderate, 3=high, 4=very High and 5= critical

6.1.3. Social Assessment

Based on ERA Route Selection Manual, there are eight sub-parameters to be duly considered in the assessment of social impact of the alternative routes. Based on an in depth analysis of the public consultation and socio-economic profiles of the Regions, Districts and towns to be traversed by these routes, the social impacts of the routes have been identified. Accordingly, the assessment and subsequent evaluation carried out by the consultant is summarized herein under in the table below.

Table 10: Multi Criteria Analysis for Social Impacts

No	Secondary Criteria	ECA value	Alternative Route							
			Option-1		Option-2		Option-3		Option-4	
			Max.	Score	Max.	Score	Max.	Score	Max.	Score
1	Community Access (G/M/P)	3.0	G	3	M	2	M	2	G	3
2	Development Potential (G/M/P)	3.0	G	3	M	2	M	2	G	3
3	Public Transport (G/M/P)	4.0	G	4	M	3	M	3	G	4
4	Resettlement (F/I/M)	4.0	M	2	I	3	I	3	M	2

5	Severance (F/I/M)	2.0	I	1	I	1	M	2	I	1
6	Cultural Heritage (F/I/M)	4.0	F	4	F	4	F	4	F	4
7	Road Safety (G/M/P)	3.0	M	2	G	3	P	1	M	2
8	Pollution (L/M/H)	2.0	M	1	M	1	H	0	H	0
Sub-Total		25.0		20.0		19.0		17.0		19.0

(F/I/M)-Few/Intermediate/Many, (G/M/P)-Good/Moderate/Poor, (L/M/H) –Low/Medium/High *with respective values of given as 3/2/1 for G/M/P, 4/3/1 for F/I/M and 2.0/1.5/0.5 for L/M/H.*

6.1.4. Conclusion and Recommendation

Environmental Assessment

The summary of preliminary evaluation of the significance of the predicted environmental and social impacts of the proposed alternative routes and their comparison is shown on the above sections. From those evaluations and the multi criteria analysis (MCA score out of 20) it can be concluded that the overall environmental impact significance is marked as 14.65, 14, 12.88 and 13.5 for alternative 1, 2, 3 and 4 respectively. Alternative 3 has the lowest total score (MCA score) in ranking. Therefore, with respect to the potential environmental impacts, Alternative 3 will impose high impacts and is the least preferred option. On the other hand Alternative 1, with highest MCA (multi criteria) score is relatively brings least environmental impacts, which is recommended to be adopted for the proposed road project. Nevertheless, it should be noted that although comparatively it is a better route, implementation of the project along Alternative 1 is expected to bring significant environmental impacts that will require due attention and mitigation measures.

Social Assessment

Based on the above table the alternative routes are marked as 20.0, 19.0, 17.0 and 19.0 which corresponds to alternative 1, 2, 3 and 4 respectively. In this case the alternative (option-1) is the most preferred option whereas the least preferred alternative (option-3) is least preferred. However it must be noted that the most preferred option does not mean to bring any social impacts and therefore passed to the next step for further social studies with adequate mitigation being envisaged especially during construction.

6.2. Alternative Construction Technologies

With respect to upgrading of the road; it will be constructed with sealed shoulders at a design speed of 85km per hour and 50 km per hour in Villages and Towns respectively. Within this option, consideration was given to the technical options for rehabilitating the road as follows:

Option 1: Complete reconstruction and widening with double surface dressing

This option will involve widening the road embankment to provide 7m carriage with 1.5m sealed shoulders throughout and 2m sealed shoulders in trading centers. Bus bays will be constructed in all the trading centers and along the road. The embankment will be raised in line with the hydrological analysis of the area.

This option will affect 36% of the road and will involve

- Ripping the existing base and resurfacing
- Ripping existing sub-base layer and stabilize as new selected sub-grade of 150mm
- Reuse the original base material as sub-base 150mm
- Import new granular base of 150mm
- Ripping the existing base and surfacing and re compact as a new sub-base 150mm
- Import new granular base 150m

There will be need for 19/9.5 double surface dressing and road markings and reflective road studs. There will also be need to repair certain Barriers or provide new concrete barriers as well as widening existing walkways on bridges to 1.5m. With this option reseal will only be required after 10-12 years and general speed restrictions will be 100km/hr. and 50km/hr. in trading centers.

This option is expected to provide additional 20 years of more on the life of the road. Road safely is greatly going to improve due to reduced congestions in the trading centers.

Option 2: Complete reconstruction with asphalt concrete dressing

Complete reconstruction with asphalt concrete dressing will have a 50mm Asphalt surfacing. This option provides low maintenance cost over a period of more than 20 years of the design life of the road. The road surface will be smoother resulting in lower vehicle maintenance costs. There will be need to

rejuvenate the spray after 10 years and reseal or overlay after 20 years. General speed restriction of 85km/hr. and 50 km / hr. in trading centers will be imposed.

Complete reconstruction with asphalt concrete dressing is therefore considered the best option.

From above, the advantages of rehabilitating the road alternative far outweigh the disadvantages of the "No-Action" alternative. Even though the initial cost of the construction will be high, the accrued benefits to be derived from the "project development alternative" socially, culturally and economically **supersede the "No-Action" alternative**.

In addition to this Air and railway transportation of the proposed Lowyado-Borama road project equipment were not found to be feasible alternatives. The area is not served by railway line and there is no air transport to the project end towns including Zeyila and Lowyaddo (boarder town). Those areas lack large airports for large cargo planes and thus air and railway transport of the equipment is not possible.

While it was considered that the environmental and social impacts of the proposed road design alternatives were not significantly different, Option 2 was selected because of its low maintenance cost implications during the 20 year design period. This option will effectively lead to reduced congestion and improved road safety along the trading centers. It also provides for a smooth flow of traffic and the road users.

7. POTENTIAL IMPACTS

7.1. General

The purpose of identifying and evaluating the ways in which a proposed project is likely to affect its environment is to predict how those matters can be taken into account during later stages of project preparation, implementation and operation. It is a kind of project appraisal technique aimed at establishing, in broad terms, the nature and likely significance of impacts. Through the identification of key impacts, it is possible to provide guidance to the engineering team concerning the location of areas of high environmental and/or social sensitivity, which should be avoided as far as possible, when identifying potential project concepts or corridors for further recommendations.

7.2. Identification of Impacts

The Lowyaddo-Borama road (256km long) is an existing gravel road. The road is under bad situation that it is not currently rendering medium traffic movement mainly big trucks and medium buses which are covering the product transport of import and export goods on the region; this is usually very serious in the rainy seasons. The road is therefore under the status of losing the required quality and causing traffic damages, generally under poor condition. It is envisaged to improve the standard and the quality of the existing gravel road to bitumen standard. The work includes: surface treatment, widening, realigning, constructing and improvement of some hydraulic structures and in general to upgrade the road to DC6.The construction and operation of this road will result in a variety of environmental and social impacts. Many of the changes will be beneficial, particularly in terms of increasing the reliability of road transport and the potential to develop the local economy. There will nevertheless be some adverse impacts on the physical, biological and socio-economic environment.

Major potential adverse impacts include:

- Loss/clearing of vegetation due to land acquisition for the reasons mentioned above.
- Impacts on flora and fauna
- Impact on homestead plantations (maize and sorghum)

- Loss of land under various uses due to land acquisition for the right of way, realignments, bridge building/culverts, detours, quarries and borrows pits, and for construction works.
- Increased soil erosion and sedimentation due to ground disturbance and alteration of drainage systems.
- Impacts of flooding due to ground disturbance, formation of gullies on relatively steep slops
- Slope destabilization due to cutting and filling on the relatively steep slopes (rolling and mountainous terrain).
- Alteration to the drainage regime and water pollution due to redirecting of watercourses at culverts and bridges enhanced soil erosion, operation of quarries and borrow pits, disposal of wastes, etc.
- Air and noise pollution due to construction activities and operation of construction machinery.
- Loss of commercially important trees due to widening of road width.
- Increased risks of communicable diseases; such as the project site is totally malaria prone area.

7.3. Positive Impacts with Implementation

Due to the implementation of the project, economic and social development will be easy and rapid with the result that the life of people living in the area improved.

- Construction of the road will enhance agro-pastoral development, as the local people will be encouraged to produce more because of the opportunity to have better access to markets and get the required inputs.
- The road will enhance fishery and fishery products development
- The road passes through an area that has high agricultural potential such as maize and Sorghum plantations which can attract more agricultural and livestock investors and possibilities.
- The road will create an easy access to an area having a high agricultural and livestock development potential.

- Development for physical and social infrastructure (road, telecommunication, electricity, water supply, health, education, etc.) in the project will be better facilitated. It will reduce travel time to the State, county and even the Regional Capital (Borama) and National capital Hargeisa.
- The project will reduce vehicle operating cost and will reduce travel time.
- It will increase non-agricultural employment opportunities.
- It will improve access to import and export, market, health and school facilities.

All the above will contribute to improving the standard of living of the poor and impact favourably on women living in the Project Area.

7.4. Negative Impact with implementation

With regard to the negative impacts of the project, the following points were raised by the consulted group:

- Problems related to employed workers who may cause occurrences of adultery, robbery, abuse of resource and cultural shock.
- The influx of workforce will introduce new habits to the project area.
- The implementation of the project will result the spread of commercial sex and HIV/AIDS expansion in the project areas.
- Impact of completion for water resources, if contractor computes the available water resource with the community
- Impact on natural vegetation due to widening and clearing
- Exacerbation of soil erosion and gully formation on the mountainous and rolling terrain
- Impact on wild life corridor as the project road construction will be a temporary impediment to existing wildlife movements
- Impacts of the Coastal land plain activities on red sea through generation of pollutants from maintenance of vehicles, machineries and workshops
- Impacts on slope instability and land sliding in the rolling and mountainous sections
- Impact on noise and air pollutions generated from workshops and movement of vehicles and machineries.

7.5. Potential Environmental and Social Impacts

The Environmental assessment at the Feasibility Study stage is held based on primary data acquired during site observation and on readily available secondary data relating to the study area. Availability of Environmentally Critical Areas has been assessed along the road corridor, as those areas are of high environmentally concern which should be avoided as far as possible during the process of identifying potential road locations/alignment. It has been observed that, the project area is mostly traverses on bush land and grass land vegetation rare occurrence of farm land including settlements. Settlements are relatively dense on the towns and villages. The other sensitive areas are sedimentation on the coastal land areas and on the rolling terrain sections areas those prone to severe erosion are also expected.

The proposed route has a significant effect on the wild life transacted by the project road; however the construction and operation of the proposed road will lead to a variety of changes in the local and wider environment. Many of the effects will be beneficial, particularly the impact at a National and local level of improving the road network and increasing the reliability of road transport and the potential to develop the local economy through improved infrastructure and increased employment opportunities. There will nevertheless be adverse effects and the principal potentially adverse impacts associated with implementation of the proposed project mostly relate to the ***location*** of the road and the ***land take requirement***. Many of the effects will be short-term and reversible nature and stem from ground disturbance; operation of equipment's and housing of the labor force, but very few that will lead to permanent change. Therefore, the potential impacts may include, impacts on vegetation, wild life, social disruption and financial losses associated with displacement from privately owned housing units and agricultural land lying within the ROW.

The nature of the proposed works and the environmental setting of the project area is such that adverse direct or indirect impacts are anticipated in respect of sensitive habitat and wildlife but no impacts are anticipated on historical, cultural heritage and burial places especially on the proposed road alignment. No new access will be created to previously undeveloped areas except widening, and riding quality improvements, and there are no tribal people in the project area whose traditional lifestyles could become compromised through road development. During construction and the operational phase, traffic levels are will

be high enough to give rise to problems of noise, air pollution or crossroad access for pedestrians transport users. Table 11 provides an overview of potential impacts associated with the project, subdivided into groups according to the phase (pre-construction, construction, and post construction/ operation) in which they may. The key adverse impacts are all such that they are capable of control within acceptable limits, provided that appropriate mitigation measures are adopted. Therefore, there are no environmental grounds for not proceeding with the project as it is envisaged at present, as it is considered that the long-term social and socio-economic benefits to the local population are such that they far outweigh the relatively minor and short-term inconvenience, which will accompany project implementation. However, the proposed Lowyaddo-Borama road project traverses through sparse farm land (mainly occurring on the high lands) , towns and villages, and erosion prone area.

7.6. Evaluation of Impacts

A checklist method is proposed for evaluation of environmental impacts of the project road. A comprehensive checklist covering the range of impacts that may be associated with the road projects was developed (see Table 8.1.). The checklist is designed to suit as much as possible the particular environmental condition in the project areas and the nature and scope of the proposed project works. For each potential impact, the checklist provides in which they may occur): The character of the impact in terms of 6 key parameters (impacts type, effect, duration, change, periodicity and areal extents), and The evaluation of potential impact significance level based on 4 common characterization parameters (not significant, small, moderate or major) subdivided into groups according to the phase (pre-construction, construction, post-construction).

Table 11:Identification and Evaluation of Potential Environmental Impacts of Lowyaddo-Borama road project

		Effect		Change		Periodicity			Areal extent						Significance level without mitigation					
	No change	Beneficial	Adverse	Unknown		Short term	Medium term	Long term	Reversible	irreversible	continuous	periodic	Irregular	Localized	Widespread	Extensive	Non- signif	Small	Moderate	Major
CONSTRUCTION PHASE																				
Encroachment on ecologically sensitive areas			x		x			x		x					x					x
Impacts on Natural vegetation			x		x			x		x					x					x
Disturbance of landscape aesthetics			x		x			x		x			x	x	x					x
Generation of noise nuisance and air pollution				x																
Interference with services			x		x	x			x	x			x	x				x		
Exposure of soil to erosion/sedimentation			x		x			x	x			x		x						x
Interference with watercourses/pollution			x		x	x			x			x		x						x
Disturbance to wildlife			x		x			x												
Generation of blasting vibration & safety hazards			x		x	x		x		x			x	x	x					x
Enhancement of slope/landscape instability			x																	
Waterborne disease risks			x		x			x	x			x		x						x
Employment opportunities for locals/gender		x			x	x			x			x		x					x	
Impacts on Land Resources (assets, loss of crop			x		x			x	x				x	x	x					x
Health risks to workers and residents			x		x	x			x			x		x					x	

Increased pressure on local services			x		x	x			x				x	x				x		
OPERATION AND MAINTENANCE PHASE																				
Increase in noise levels			x	x			x		x					x						x
Pollution of air/reduced			x				x													
Green House Gas Emission/increase			x	x				x		x						x			x	
Restriction on wild life corridor			x	x			x		x					x						x
Traffic Safety			x				x													

8. MITIGATION AND ENHANCEMENT MEASURES

8.1. General

A scoping exercise was carried out to identify key issues of concern and impacts likely to occur during the implementation of the project. The scoping exercise made use of a comprehensive checklist covering the range of impact which may be associated with the Lowyaddo-Borama road project. Accordingly the area through which the project road traverses can be generally characterized as rural in nature dominated by extensive livestock rearing (grazing) and limited cultivated land uses with very sparse population and settlement around the end point of the project and sparse cultivated land and a sparse settlement on Garisa-Lowyaddo section.

On the start, medium and end section, the villages including scattered human settlements along the project road depend mainly on livestock rearing mixed with small holder's agricultural production activities for their primary source of livelihood. Traditional markets are usually located at the centers of these villages and rural towns.

There will be both positive and unavoidable negative impacts associated with the project road and new realignment section. It is anticipated that most of the unavoidable adverse effects, associated with the construction will be reversible in nature. These may stem from ground disturbance, operation of equipment, and labor force housing, workshops, open and sheltered storage, parking, concrete batching plant etc. It is anticipated therefore, very few impacts will lead to irreversible negative permanent change. The single most important direct impact of the project will be the requirement for land needed for the works. The permanent works will include the carriageway, shoulders, embankments, cuttings, side drains, bridge and culverts, and any associated river training and erosion control works.

In this section potential impacts after the construction and operation period of the proposed road realignment for various elements of the physical environment have been identified and quantified where possible and mitigation measures that should be adopted to avoid or minimize potential adverse impacts are recommended. Of which, some involve good engineering practices while others viewed from socio-economic as well as humanitarian angle.

8.2. Positive Impacts of the Project

The proposed project would provide several positive impacts. The major positive impacts are described below:

8.2.1. Local Income-generation During Construction

The creation of temporary jobs can be considered as a positive impact of the road construction to the local people. Some individuals may gain skills that can be applied in other road construction projects too. Further direct opportunities include entrepreneurial development as a result of the increased population and increased infrastructure usage. This includes items such as supplies, accommodations, food outlets, restaurants etc. The general economic growth of the region due to increased access and increased traffic flow on the envisaged road and adjacent roads will create further indirect job opportunities. Markets will be much more accessible, thereby providing people the opportunity to increase production and access to external markets with their products.

The creation of regular wage employment in the rural parts of project area is important, even though it will be on a relatively small scale, at relatively good rates of pay and for a limited period, since there are currently few other opportunities available. The presence of the workforce, who is likely to be relatively cash-rich compared with the majority of the rural population, will undoubtedly encourage individuals to set up stalls to supply food and other consumables at worksites. Businesses in the local towns will also benefit financially through supplying goods and services to the workforce when they are on leave, as well as through the contractors purchasing some of the food requirements of the base camps. It is recognized that for those individuals who are fortunate enough to gain employment and those who provide goods and services, the impact on family incomes will be relatively high.

Although labor recruitment is a matter for the contractor, who has the right to determine whom he shall and shall not employ, he should be formally encouraged to hire locally wherever possible, in so far as this is compatible with his skill requirements, in order to maximize the benefit distribution and social acceptability of the project. He should also be encouraged to procure supplies from local sources to the maximum extent possible in the circumstances.

8.2.2. Gender Impacts

Women in the project area could work as daily labourers and in other similar activities during project implementation and operation. Female-headed households in particular could benefit from the employment opportunities that would be created. They also gain working skills that can be applied in other similar activities. It also helps to develop confidence and self-sufficiency among women who are involved in the road project work. The other benefit of the project for women during construction of camp site and residential units is that it would help to start small businesses such as opening tea houses, meal houses and small shops, etc. Therefore, in order to harness these advantages, the project will encourage use of local manpower giving priority to women.

8.2.3. Economic Growth

With enhanced implementation of the upgrading project not only the economy of the local people would be improved, but also will contribute its share to better facilitate overall economic growth of the country. Since the road will be better condition the project will create favourable environment for drivers to drive safely and timely to deliver exchange of goods.

8.2.4. Traffic Safety

Improvement of road quality will provide better road condition for driving heavy tracks thereby facilitating the overall activity of the area. Besides to this there will be a reduction of travel time, traffic accident and vehicle operation cost. Due to smooth driving; traffic accidents may increase which shall be considered and minimizing by introducing traffic management plan.

8.2.5. Local Social and Socio-economic Benefits during Operation

With regards to transportation, most of the villages belonging to Awdal Region, Selel Region and the towns are now least developed in terms of connectivity, accessibility and mobility. Most rural people and villages in those Regions are either have connection to motor able roads or use even wheel-based intermediate technology modes. As a result, the large majority of rural population mostly depends on backward traditional modes such as walking, human porter age and pack animals along a network of narrow, untended, century's old local footpaths, trails and tracks. This traditional mode is relatively

burdensome, expensive, time consuming and unsuitable for modern development needs. As a result, it is very difficult for these isolated communities and villages to easily obtain their daily domestic needs, profitably market their surplus products, to buy basic needs and inputs at fair prices and to get access to vital socio-economic services. Therefore, by far the most significant beneficial impact of the project is expected to be a major improvement in social and socio-economic conditions for all who live on or relatively close to the new road. The construction of the new realignment road will have a number of vital contributions to rural development; supports poverty alleviation schemes, improves food security, improves marketing, enhances export earnings, promotes balanced growth, strengths stability and help social development. At present there is little incentive for most smallholder agro-pasturalist to produce anything other than subsistence crops, since access to markets where cash crops can be sold is difficult, particularly for those who live more than a few kilometers from one of the towns. The new road is likely to lead to the introduction of transport services, which operate between the main centers of population and also from between a town market and villages along the road, as has been the case following construction of other similar roads in the country. This may open up the prospects for crop diversification in the long-term, with short-life, but relatively high value produce such as vegetables becoming a financially viable option. It is also anticipated that younger people would likely enroll in school and go on to higher educational facilities due to better transportation with access to road, services will be improved. Different goods and services will likely be available raising the standard of living and way of living. Electricity and other services often follow the road and will likely change the way of life of people in existing population centers. Benefits will also be realized in terms of improved access to hospital and other medical services.

Continued enjoyment of the benefits of the upgraded road will only be achieved if it is maintained in an improved state. It is therefore recommended that: the Somaliland Roads Authority should ensure that adequate budget and resources are allocated to routine and periodic maintenance of the project road, and that an effective maintenance program is initiated and sustained.

8.3. Negative Impacts

8.3.1. Impact on Water Resources

Impacts on Water Pollution from Sanitary and other Wastes and Spillages

Rivers, groundwater and ponds are used for potable supply purposes throughout the project area for drinking, washing purposes and cattle watering. There are also several rivers, streams and water supply ponds along the project road as indicated under the baseline information above. Pollution of these resources may arise at or close to the base camp or work sites as a result of inadequate provision of sanitary and waste facilities, and accidental or deliberate spillage or leakage of polluting materials. Such pollution adversely affects those who depend on local water resources. Inappropriate disposal of refuse and some materials used in construction can also lead to public and animal health hazards.

Mitigation measures

Water source pollution is of potentially high significance along the project road. Therefore, the contractor should take all appropriate mitigation measures to minimize pollution risk.

- Require the contractor to make specific and adequate provision for the disposal of sanitary and other wastes in such a way as will not result in any form of pollution or hazard to human or animal health.
- The contractor to take all reasonable precautions to prevent spillages and leakage of materials with the potential to pollute water resources. The measures should be maintained in an effective condition throughout the life of the base camp.
- Specifically prohibit washing of vehicles and plant in or adjacent to any water sources. All washing to be carried out at designated areas away from water sources.
- The contractor is responsible for cleaning up any pollution caused by his activities and the payment of full compensation to those affected.

8.3.2. Impacts of Competition for Water Resources

During construction there will be minor effects on surface water hydrology due to the creation of new cuts, drains, and culverts. However, the majority of this work will be carried out during dry periods when there is no or little surface flow. The contractor will require substantial volumes of water for various construction purposes such as adjustment of moisture content of fill, road sub-base and base courses, and watering of haul routes to suppress dust. In addition, the water requirements at the base camps will be relatively high, although these will be much lower than those needed in connection with construction. It is probable that some of the contractors' water requirements will be met by abstraction from watercourses. During the dry season, most watercourses which the road crosses have no flow and where there is, it will be very low and any scale withdrawals by contractor could reduce water availability to existing users. Surface water and ground water may be contaminated by improper utilization or storage of construction materials which are toxic or hazardous, including chemical or petroleum products such as diesel fuel and lubricants. Contamination could also arise from lack of proper treatment and disposal of sewage from construction work camps. Sand and gravel removal from river beds is not expected to have any adverse impacts. River beds are traditional sources for sand and gravel and long have been in use. Construction works might increase sediment loading temporarily on nearby rivers and streams. However, sediment concentrations and loads naturally vary over a wide range during the year, and as a result, aquatic communities will be able to adapt to temporary high sediment loading conditions very easily.

Mitigation measures

Impact can be minimized satisfactorily by requiring the contractor to make his own arrangements for water supply which will not affect the rights of others, and to provide an alternative supply if interference does occur. Most of these impacts can be controlled by good house-keeping, appropriate response to emergencies, and effective clean-up of accidents and spills. It is therefore, recommended that the following measure should be adopted:

The contractor is responsible for making his own arrangements for water supply for construction and other purposes without affecting the quality or availability of groundwater or surface water resources to existing users. In the event of there being any valid dispute regarding the effect the contractor's

arrangement has had on the water supply of others, the contractor shall be responsible, at his own expense, for providing an alternative supply to those affected, which is not inferior in quantity or quality to that previously enjoyed.

Such impacts could be alleviated by prohibiting from using water points and water sources that are used by the public and allowing the contractor to use his own sources by tapping ground water (boreholes) or by creating storage during the rainy seasons.

8.3.3. Impacts on Natural Vegetation

Impacts

One of the major unavoidable impacts of road works is the effect on the terrestrial vegetation in the vicinity of the construction works particularly on the ***mountainous wood land vegetation***. The impacts on natural vegetation is associated with the construction of carriageway width, bridge and other drainage structures, operation of quarry and borrow areas, and the construction access to quarry and borrow sites, etc. A terrestrial vegetation survey–done in the course of the field investigation confirms that some locally or regionally endangered plant species will be affected as a result of the proposed road upgrading. However, due to the proposed realignment and increasing the existing carriageway width, a number of riparian (river crossing) and in land trees will have to be cut down. The corridor area in which the project road traverses is described as sparse woodland on the high land, riparian forest and bush land mixed with grass land in the interface. Otherwise, there are no sensitive area such as National parks and priority forest areas transected by the proposed project road. There is a real possibility of the workforce engaging in illegal timber extraction to the determent of the environment if adequate controls are not applied. Policing of the existing vegetation from a conservation viewpoint is probably ineffective as a result of manpower and other constraints.

The impact of deforestation shall be exacerbated after construction (operation stage) as many people start to live alongside the forest areas due to better access and / or access facilities. After construction people will be migrating to this area and there will be big demands for charcoal and house building. This will increase deforestation and will destroy the natural habitat.

Mitigation Measures

It is recommended to adhere to principles of environmental conservation during the construction period in order to avoid excessive destruction of vegetation and disturbance of land and riparian forest area. Therefore, to minimize the destruction of trees and natural vegetation, it is recommended to:

- Avoid excessive destruction of trees and other vegetation;
- Consider the location of mature trees during route selection for the access road construction and land clearing for quarry and borrow sites; and compensate the lost natural vegetation as appropriate.
- Prepare a plan to remove mature trees in borrow and quarry sites so as to obtain optimal benefits from harvested timber;
- Compensate in cash for the loss of privately-owned mature trees and by replanting
- Specifically prohibit quarrying, borrowing, spoil disposal and camping within the boundaries of ***dense vegetation***, existing productive farmland(in the high land) and riparian forest;
- The contractor will be responsible for any fire accident caused by his activities within the woodland and riparian forest;
- The contractor is responsible for the conduct of his workforce in relation to environmental protection matters and to specifically prohibit unnecessary felling of trees.
- During operation stage; the contractor should design awareness program against deforestation or any charcoal selling especially in high land vegetation and other forest areas along the corridor.
- The Republic of Somaliland, Government needs to establish forest development program incorporating legal framework and legal enforcement mechanism against deforestation.

- The Somaliland Government need to design alternative energy sources under Rural Electrification Program as a long duration plan to electrify the existing rural areas and the newly appearing rural areas adjacent to forested areas alongside the road alignment. The use of biogas and solar energy can be introduced as they are climate resilience undertakings.

8.3.4. Impact on Land Resources

The road construction project basically follows the existing alignment, however additional land acquisition will be required for widening the existing variable width of the road to a standard width, improving grades through cut and fills, collection of construction materials and for new alignments in some lengths for easing curves/grades and introducing culverts and bridges. Land acquisition will also be required for material access roads and for the stretches taken up for construction in order to allow easy flow of traffic. For these uses, land under cultivation, housing units and utilities in town sections, and natural vegetation will be mostly affected. In addition, land loss will be related to extraction of construction materials. Several sites have been proposed as sources of materials for construction of the road.

Furthermore, there will be impacts on land associated with construction camps and storage of construction materials as well as disposal of spoil materials from road cuts during construction especially if they are tipped onto adjacent productive lands. In total the number of people affected by the project is assumed to be greater than 300 (Three Hundred individuals). This necessities the requirement of Resettlement Action Plan (RAP) as mitigation measure for loss of land, crops and assets.

Mitigation Measures

- Provide detours wherever possible and necessary to minimize the impact of the road construction on the road side cultivation, homestead plantation and housing units.
- Allow farmers adequate time to harvest their crops.
- Avoid detour roads wherever there is significant amount of roadside cultivation along the intended detour, quarry site and borrow pit area. Instead use main road with the help of traffic management plan, construct half of the road while the other is used for traffic.

- Provide adequate and timely compensation for the land to be acquired.
- In case there is natural vegetation, implement also the mitigation measures indicated on section 8.3.3.

8.3.5. Soil Erosion

Roads usually enhance soil erosion because they concentrate runoff as channel flow rather than a uniform overland or subsurface flow. They also dissect fields and interrupt established drainage, particularly in the rolling sections.

The road construction project will involve clearing of the vegetation cover and cutting in soil with heavy machinery for widening the road, construction of bridges, culverts and side drains and material access roads, and for collecting construction materials from quarries and borrow pits. Significant soil erosion is expected from areas where the soil is disturbed and exposed to runoff. In addition, it would demand construction of numerous cross-drainage structures, bridges, culverts and side drains. The building of these structures will require large excavations for foundations and this will exacerbate soil erosion. Such problems are mostly conspicuous in the rolling areas of the road section with slopes exceeding 4%.

Besides the loss of productive soils due to erosion and land acquisition for the abovementioned activities, soils can be impacted as a result of disposal of waste materials from cuts and other earthworks, compaction with heavy machinery and disposal of used oils and lubricants and spills of oils and fuel from engines of vehicles and diesel operating machinery as well as accidental spillage.

Mitigation Measures

- Line road side run off ways
- Design and construct culverts and pipes that have adequate openings to pass the design flood in order to minimize scouring and erosion downstream structures.

- Construct energy dissipating structures at the drainage outlets and discharging points on the relatively sloppy areas.
- Construction of turn out ditches to reduce the amount of flow and travel length of flow parallel to the road
- Rehabilitate existing gullies.
- Design road side drainage structures in a such way that it can carry all the possible run off.
- Provision of cross drainage structures as close as possible to reduce the amount of flow from side ditches and to let the flood join to the nearest stream easily

8.3.6. Air Pollution

The major effects on air quality during construction would be an increase in suspended particles (fugitive dust) from quarry activities, crushing and concrete batching plants, and construction works (blasting, excavation as well as movement of heavy machinery, trucks and trailers) construction equipment and emissions from vehicles have the potential to negatively affect air quality in the vicinity of the construction sites and access roads. The burning of wastes also has the potential to affect air quality. However, impacts from these activities will likely be confined to areas within 200-300 meters downwind from construction sites and these operations take place in locations away from major settlement areas.

Mitigation Measures

The potential risk to air pollution will be mitigated or minimized by implementing the following measures:

- Water access road section and construction sites to reduce fugitive dust generation to prevent damage to dwellings and avoid nuisance to persons. Construction roads should be watered near settlement/villages on a set schedule depending upon weather conditions;
- Construction machinery should be well maintained to minimize excessive gaseous emissions. The engines of construction machinery and vehicles will be inspected and adjusted as required to minimize pollution levels;
- Avoid disposing of any volatile chemical to the air such as bitumen;

- Burn waste and/or garbage in designated areas and away from nearby villages and in accordance with Applicable Law; and
- Avoid the burning of materials such as tires, plastic, rubber products or other materials that create heavy smoke or nuisance odor. Do not burn material which produces toxic gases.

8.3.7. Noise Pollution

Sustained noise levels during construction are expected to be much higher than the ambient noise levels in the project area. Noise and vibration result from construction activities in general but particularly from operation of heavy machinery including vehicles, excavation equipment, concrete batching plants and crusher plant sites. Other sources of noise will be explosives used to prepare the foundations for construction of the dam and access road. Noise intensities from blasting at quarry sites, or in areas of rock excavation range from 80 to 100 dBA at source. Sustained noise levels during construction are expected to exceed 70 dBA at a distance of 200 meters from source. The road passes mostly through a rural area with a relatively low population. Therefore, noise and vibration impacts during operation come from vehicular traffic. Traffic levels are likely remain low and consequently noise is not considered to be a significant problem

There are sensitive noise receptors like schools, health institutions and worship places in the vicinity of the construction areas and consequently, noise generated from the construction sites will be a major annoyance to a large number of people in major settlement areas. Although noise impacts on communities are unlikely, excessive noise is likely to impact the construction workers in and around the construction areas. The construction area harbors only limited number of wildlife. However, wildlife that inhabit the project area are not familiar with the noise level related to the traffic and construction activities and some may move away from the noise and eventually return to the area when construction is complete.

Mitigation Measures

The potential noise impacts will be mitigated or minimized by adopting the following measures:

- Near settlements activities producing excessive noise level including blasting should be restricted to day time except for underground works. To reduce night time disturbance from construction noise, that is unavoidable, the practice of conducting construction activities should be limited between the hours of 2100 and 0600 in areas which are within 500 meters of residences. To cause least disruption to local population, it is recommended that construction producing nuisance noise

- Equipment normally producing high levels of noise should be suppressed and screened when working within a distance of 200 meters from any settlement, clinic, religious places or other sensitive noise receptors;

- Repair or replace if mufflers and other noise control devices of construction equipment and vehicles are defective; and

- Provide adequate hearing protection to construction workers exposed to noise

8.3.8. Impacts of Public Health and Safety

As part of the project areas are low land, with rivers, streams and ponds of various sizes. This kind of topographical has created varying grounds for different kinds of diseases, particularly water born & water related ones. Major health problems of the project area are reported to be different types of infectious diseases & water related disease. According to the information obtained from respective counties health offices along the project road, the public health status is not improving over time as the health service did not reach the grass root communities on the project area.

The most commonly reported out-patient diseases are malaria, Helminthiasis, upper Respiratory infections, Gastritis, skin disease, eye disease & diarrhoeal diseases. In general, most of the diseases are related to poor personal hygiene, in adequate & unsafe water supply & lack of basic sanitary facilities.

Though it is not included among the top prevailing diseases, HIV/AIDS, CORONA Virus are increasing health and social problems along this road.

Among the above diseases malaria and sexually transmitted diseases including HIV are expected to increase as a result of road construction processes due to influx of work force in to the reception area/community.

On the centre of villages, there may be a problem of crossings for both human and livestock during construction and operation phases; since the people residing on those areas are not aware of traffic accidents unless mitigated.

Mitigation Measures

Health and risk management should be done to avoid unnecessary impact on human health. Elements of health and risk management include the following:

- Providing health facilities (mobile clinic or first aid service depending on the size of workforce).
- Provision of adequate speed breakers on the major village sections
- Providing health education on how to arrest HIV and other sexually transmitted diseases.
- Implementation Country code of CORONA virus alleviation measures

In terms of public health services, the project will have a great benefit mainly by improving access to health facilities. The negative impact due to increases in STDs, especially HIV/AIDS will be mitigated by education and sensitising the local population. The following are additional measures that will be taken to minimize the public health and safety impacts:

- Awareness creation program for workers to protect them against these diseases.
- Provisions of protective means such as condoms
- Provide clinical services
- Medical Check ups
- Provide personal protective equipment such as gloves.
- Instructions and enforce safety procedures of the plantation to avoid accidents and injuries.
- Use personal protective equipment to safeguard the safety of the workers.

- The work place and premises should be kept clean and safe.
- Good hygiene and sanitation of the working area.

8.3.9. Impacts of Clinical Waste

The waste disposal Ordinance defines clinical waste include:

1. Used or Contaminated sharps:- Syringes, needles, cartridges, ampoules and other sharp instruments which have been used or which have become contaminated with any other groups of clinical waste; needles include acupuncture needles.
2. Laboratory waste: unsterilized laboratory stock cultures or cultures, of infectious waste with significant health risk from dental, medical, veterinary or pathological laboratories.

Potentially infectious waste with significant health risk from dental, medical, veterinary or pathological laboratories refers to those unsterilized materials or devices used to culture, transfer, inoculate or mix the laboratory stock culture, or culture, of infectious agents. Examples include culture dish, bottle, flask, tube, pipett, pipett tip, and inoculation loop and inoculation wire.

3. Human and animal tissue;- include all human and animal tissues, organs and body parts as well as dead animals, but excluding:
   a. Dead animals and animal tissues, organs and body parts arising from veterinary practices.
   b. Teeth arising from dental practice

4. Infectious Materials
   Infectious materials from patients with the following pathogens
   Crimean
   Ebola virus
   Guaneriito virus
   Hendra virus
   Junin virus
   Nipha virus etc.

5. Dressing
   Surgical dressings, swabs and all other wastes dribbling with blood, cacked with blood or containing free flowing blood.

6. Other wastes

Such other wastes as specified by director by notice published in the gazette if in this opinion such wastes.

a. Are likely to be contaminated with infectious materials from patients falling with such case definitions as specified in the notice; and
b. May pose a significant health risk.

Hazards Associated with Clinical Waste

Clinical waste is potentially dangerous because it can cause cuts and needle-stick injuries or transmit disuses. If improperly handled , clinical wastes would be hazardous to people at the work place, cleaners, waste handlers, and generally the public.

Clinical Waste Management

Clinical waste is any waste resulting from medical, nursing, dental, pharmaceutical, skin penetration or other related clinical activity that has the potential to cause injury, infection or offense.

Treated wastes are not injurious, infectious or able to give rise to offence

Mitigation Measures

Medical Waste Treatment

A. Autoclave-can be used for sharp and infectious waste

There are various solutions:-

i. Centralized plant

This is done by centralized medical Autoclave which provides picking up, processing and disposal services of medical waste collected from nearby hospitals and health care institutes.
This apparatus is easy, safe, efficiency and environmental friendly
Green process without hazardous, low operating and maintenance cost and at least 15 years life span

ii. Mobile Solution

Mobile medical waste treatment

This system is also composed of autoclave, shredder system, boiler and dedicated power generator.

iii. Onsite Disposal

Using integrated autoclave with shredder.

- Incineration-Most appropriate and ultimately way of disposal for all types of wastes
- MICROWAVE-Can be used for sharp and some infectious waste
- CHEMICAL TREATMENT-can be used for lab waste

8.3.10. Impacts on Wildlife Corridor

There exist a diversified wildlife habitats reported on the mountainous zone, upland plain and the coastal land zones. There are endangered animal species identified that will be affected by construction activities. Destruction of valuable wildlife habitats and impediments to wildlife movements is also expected during construction and/or operation of the Project Road. The project road construction will be a temporary impediment to existing wildlife movements. It will be more sever during operation as the quality of the road will be improved which enables moving traffic to rush at high speed. This will be a significant impact unless a speed break is installed within a certain distance kilometers distance in places where wild life corridor exists.

Mitigation Measures

- Totally avoid locating quarry and/or borrow pits, camp sites and other workforce stations, development of water points within the bush land habitats, especially in the upland plain.
- Avoid Horn and noise on wild life corridor
- Avoid material access road along the route adjacent to the park area
- Use controlled blasting using chemicals, if badly required
- Educate/orient construction workforce that hunting is completely forbidden and illegal
- The work force should not hunt animals for food and sport

- To reduce night time disturbance from construction noise in the park area, that is unavoidable, the practice of conducting construction activities should be limited between the hours of 2100 and 0600 in areas which are within 500 meters of the wild life habitat areas.
- Equipment normally producing high levels of noise should be suppressed and screened when working within a distance of 200 meters from sensitive noise receptors/wild life habitats;
- Installation of speed break and billboard in wild life corridors.

Possible mitigation measures are proposed for the impacts of the development project. Table 10 indicates the identified problems and their respective mitigation measures. Also the stages of the project at which the expected impact would occur, scope and magnitude of impacts and as to who will be responsible to implement these mitigation measures are identified.

8.3.11. Impacts of Coastal land plain Activities on Red Sea

This impact will occur during both construction and operation. Activities such as earth work and other ground disturbance as a result of machinery ground interactions will exacerbate erosion and sedimentation. Grease and oils during maintenance and servicing of vehicles and /or machineries will also induce impacts of pollution on the water bodies which ultimately affects the phytoplankton and zooplankton life inside the same. During operation passengers traveling from Lowyaddo/Zeyila to Borama and visa vise may rest for limited time and require resting rooms or may pollute the coastal land/coastal land marginal land with solid and liquid waste which pose pollution.

Mitigation Measures

- Install mobile toilets and solid waste disposal barrels in areas where bus stop bay areas
- Implement all the mitigation measures related to erosion and sedimentation impacts to minimize sediment load especially on the upland plain and mountainous zones.
- Implement grassing alongside the road as sediment trap
- Avoid car washing and change of used oil in the marginal land of the sea

8.3.12. Impacts on Slope instability and land sliding and Landscape

The major variables affecting slope stability are topography, geology, vegetation, rainfall intensity and land use (human influence). In general, areas with weathered rocks, steep slopes and scarce vegetation cover are more susceptible to slope instability.

Cutting and filling in steep slopes will most likely induce slope instability problems along some sections of the road. In some sections especially from Bon-Arweren-Halimale-Hugferes section (landslide on water divide). Widening of the road width would require cut and fill, and at several places the cut or fill slopes will not intersect with the existing grade within a reasonable distance. These slopes will be vulnerable to slope instability unless protected with stabilizing structures such as retaining walls and gabions.

Mitigation Measures

- Sound hydrological analysis should be made to determine openings of structures that can adequately discharge runoff without creating scouring and siltation problems at both the inlets and outlets of structures;
- Energy dissipaters (constructed of local and cheap materials without compromising their ability to reduce the energy of runoffs) should be installed along longitudinal as well as transverse drainage structures;
- The appropriate remedial measures to avoid the slide problem are flattening of the slopes, benching and removal of the unstable materials. The appropriate slope ratio, depending on the material type, shall be according to RDA Geometric Design Manual. For this particular project, since the rock fall is not severe, flattening of slope is adequate to prevent the damage;
- The local farmers should be consulted on site as they are currently seen leading the water from one side of the road to the other with small ditches on the road surface. That is, although may not be required from hydrological perspective, a culvert to allow passage of water from one side of the road to the other should be designed as a response to response to public need;

- Deep cuts, high embankments and other unstable slopes should be stabilized by means of either bio-engineering (like grassing) or physical structures.; and
- Physical energy dissipaters such as check dams, scour checks, rip raps, etc. should be installed at such designated sites.
- Apply slope stabilizing mechanism such as wire basketry, gabions etc. as permanent installation on risk slopes
- Install cut-off drains above cut slopes
- Protecting slopes vulnerable to landslides by constructing retaining walls, gabions etc.
- Re-vegetate unstable slopes as soon as possible after excavation
- Remove all dangerous and loose boulders and rocks from cut faces
- Limit disturbance to natural vegetation above cut slopes

8.3.13. Impacts of Construction Spoils

It is expected that the project works will generate large quantities of spoil material especially due to widening of the carriage width and some minor geometric design adjustments. It is likely that there will be occasions when unsuitable existing road material will need to be removed and disposed of.

In hilly areas, there is always a temptation for contractors to side-tip excess material. Such actions can result in the death of down slope vegetation and the stimulation of erosion, which ultimately works upslope towards the road. In addition, material eroded from the spoil itself can be deposited in water courses, with adverse effects on channel morphology and capacity to convey flood flows, deteriorates the water quality of receiving streams.

Disposal sites are temporally designated in the Engineering Concept Design whereby borrow pit analysis was undertaken and tentative disposal sites are recommended. This shall be further developed with a view to optimize this operation.

Mitigation Measures

- Contractor should dispose spoils on designated spoil disposal areas by the Engineer
- Avoid side tipping of material spoils on to adjacent farmlands, grazing lands, homestead plantation.
- Avoid spoil disposal in wetlands and drainages (rivers, streams and other water bodies)
- Avoid spoil disposal in sloppy areas

9. ENVIRONMENTAL and SOCIAL MANAGEMENT PLAN (ESMP)

The objective of the ESMP of the road project is to minimize adverse impacts of the development on the environment by managing and implementing the proposed impact alleviation measures and good working practices. The purpose of the management plan is to assist the project proponent follow step by step implementation of mitigation measures for impacts that can arise during different stages of the project development. Moreover, the prepared management plan is to help the competent authority to monitor or audit the proper implementation of the mitigation measures by the project proponent.

Under this section specific management activities to overcome identified impacts of the road project are outlined. Almost all of these activities will take place during various development phases of the project.

All the practical activities can be carried out by the contractor while the supervision and monitoring of these activities can be done by the environmental inspector from competent authority.

9.1. Construction Phase

During construction, the contractor will be responsible for implementing the environmental mitigation measures proposed in this ESIA report. The Construction Supervisor shall monitor impacts and the proper implementation of mitigation measures particularly the impacts on the bio-physical and social environment. The Construction Supervisor will be fully responsible for ensuring that all the works will be carried out in accordance with the specifications and drawings, that the environmental impacts will be taken into consideration and that good workmanship will be followed. He/she should also be empowered to deal with infringements at the time and on the spot.

It is also proposed that an Environmental Inspector be assigned by Somaliland Road Authority, who will be responsible to conduct supervision in close collaboration with the Somaliland Climate Department so that the department can provide valuable information and guidance to bring climate resilience endeavours with respect to this specific road development. Similarly the climate change department in Somaliland should be also aware of the Lowyaddo-Borama project so that he/she can use it during screening process of climate change aspects. The Environmental Inspector will be responsible for the overall coordination of

the environmental management activities. As such he/she will advise and/or consult with the Contractor, Construction Supervisor and the local authorities or offices regarding the implementation of environmental mitigation measures and monitoring of impacts. In particular, he/she will continually consult with the local parties who will be involved in the implementation of mitigation measures and monitoring of some impacts, and get feedback from them to deal with any unforeseen problems.

The major environmental management issues to be undertaken during the construction phase include but not limited to:

9.1.1. Waste Management

- All solid and liquid wastes generated from the road construction activities should be managed properly. Solid wastes must be collected and burnt in a burn pit specially created for this purpose. These burning pits must be placed away from the populated areas and covered up after completion of the construction work.
- Mobile toilets and waste barrels for non-biodegradable wastes such as plastic bottles and other solid wastes alongside the road in the coastal land zone.
- All the used oil from the plant and equipment must be collected and burned or sent for reprocessing. The environmental inspector has to ensure the proper implementation of these activities and submit a report on the status of environmental management to the client.

9.1.2. Air Pollution and Dust Management

Road construction process is the major source of dust emission and air pollution. However it can be managed by:

- Discarding construction wastes at a registered waste management facilities/land fill sites.
- Preventing the generation of air pollutants during the construction period by watering during crushing and screening of aggregates.
- Watering of the detour roads.
- Avoiding the burning of materials such as tiers, plastic, rubber products or other materials that create heavy smock or nuisance odour.

- Avoiding disposing of any volatile chemicals to the air.
- Minimizing smoke emanating from vehicle's exhausts by keeping them in good condition

9.1.3. Roadside Erosion Management

Road construction is one of the causes of roadside erosion. Unless proper erosion management practice is in place, its impact would be severe. Therefore, the following roadside erosion management plan is proposed:

- Estimate run off that can be passed through the drainage system and determine the size of drainage ditches in such a way that it can entertain the entire run off adequately.
- Line the drainage ways with stone and cement or concrete.
- Put structures at the outlet of drainage ditches to dissipate runoff energy.
- Re grass and replant road side cuts on mountainous areas.
- Rehabilitate already established gullies on the road sides.
- Regrade and regress the borrow pits and quarry areas.

These activities should be specified in the contractual agreement and the environmental inspector or Client has to supervise the implementation.

9.1.4. Roadside Vegetation and Infrastructure

As much as possible attention must be given to save the roadside cultivation and infrastructures along the road. Important environmental management activities include:

- Maintaining of solitary trees on the road sides.
- Planting new trees as a compensation for the lost plantation, but leaving enough space for the future road widening and maintenance purposes.
- Construct road sections, which pass through cropped areas after the harvest
- Relocate roadside infrastructure such as power lines, telephone wires, water points etc. before construction of the road commences if any.
- Inform owners beforehand that their agricultural production are at risk.

9.1.5. Management of Socio-Economic Conditions

In general, the project will have socio-economic environment positive impact due to the development of project in the area. The project will create rural employment. In addition social welfare program shall be enhanced or created. These include provision of medical facilities educational facilities, water supply, recreational amenities for the employees. New villagers will be established and local people will be consulted in all activities and eventually to make them partner in the developmental process.

During employment of workers, in the recruitment process of the organization, local people will be given preference on the basis of their qualification and experience and as per the requirement of project. Gender equity will be ensured as much as possible in the employment process and this will be properly managed.

With regard to hygiene and environmental health, normal sanitary and cleaning facilities will be provided within the premises. The management will carry out periodic health checkup of workers of all sections. Gender equity in employment activities shall be addressed and properly managed.

Occupational hazards involved in project related to dust pollution, noise pollution, and injuries from field activities, will be avoided or highly minimized. The management of the project will give the necessary guidelines for safety against these occupational hazards as per the national guidelines.

9.1.6. Health and Risk Management

Health and risk management should be done to avoid unnecessary impact on human health. Elements of health and risk management include the following:

- Providing health facilities (mobile clinic or first aid service depending on the size of workforce).
- Providing health education on how to arrest HIV and other sexually transmitted diseases.

In cases of Malaria out break:

- Provide mosquito nets and insect repellents.
- Drain out any water holding areas around the camp and settlement areas.
- Avoid pond formation that creates conducive environment for mosquito breeding.

- Training personnel involved in the different stages of the project activities about safety procedures and emergency response plans associated with their task.
- Paying attention to mother and child safety during project activities.
- Provide clean water for drinking and domestic use and avoid use of contaminated water.

9.1.7. Traffic Management

Traffic management is very essential, particularly in the towns where there are multiple modes of traffic. The construction contractor should establish a system for managing the traffic during **construction. Traffic** management plan should include:

- Using appropriate and clear signs on the road.
- Limiting the speed.
- Creating traffic awareness to the people, particularly at schools and churches.
- Allocating temporary traffic police/flagman.
- Providing detour roads wherever possible.
- Informing parents to keep children from exposure to the construction area.

9.2. Operation Phase

During the operation period, the environmental issues shall be monitored by Somaliland Road Authority Road Agency and relevant State and Regional offices. In particular, the Somaliland Road Agency mainly through its Maintenance Branch will take the major responsibility for follow-up of the road and its maintenance as well as monitoring of many of the socio-environmental parameters. Other organizations that will be involved in the monitoring of some parameters include: The Republic of Somaliland Environmental Protection Ministry, Somlailand Climate change Department, Awdal Region, Borama City and Bon, Towns and villages of Zeyila, Lowyaddo and other sub district Administration, the respective Agriculture and Health Offices belonging to the project road.

9.3. Environmental and Social Monitoring

Socio-Environmental monitoring of the project is a very essential part of the project implementation. It helps to follow up the implementation of the proposed mitigation measures, as they are required and to anticipate possible environmental hazards and/or to detect unpredicted impacts over time. Such monitoring has to be carried out by an environmental inspector assigned to the project. The responsibility of the environmentalist or equivalent appointee will be to ensure the implementation of all the proposed mitigation measures performances. The inspector should focus on the following indicators but not limited to:

9.3.1. Monitoring of Soil erosion

Usually development processes involving earth work such as vegetation clearing and/or levelling accelerate soil erosion. Moreover, absence of effective monitoring further exacerbates erosion problems. Therefore, it should be the responsibility of the environmental inspector of the developer to ensure the implementation and effectiveness of erosion control measures. He should monitor the land levelling process, clogging of water ways, drainage works/ditches, and gully reclamation works etc.

9.3.2. Land use

The overall impact of this project on the land use is high; some specific impacts should be reduced as much as possible. The inspector should ensure that after the completion of the project all the disturbed land use as a result of land clearing and levelling are returned to state that could be usable by communities.

9.3.3. Health

Health situation of the project area has to be monitored to see the impact of the road project processes on the human health and also it has to be checked whether the proposed mitigation measures to overcome the health impact are carried effectively or not. The environmental inspector has to inspect the overall environmental situation in relation to health. His task should include:

- Monitoring water impoundments, marshy areas and water holding structures to ensure the presence or absence of mosquito, the vector of malaria.
- Inspecting the proper handling and storage agro- chemicals that might be used in the process of bio-fuel production.
- Monitoring to minimize dust born health problems.
- Monitoring that educational service for the work force to create awareness regarding the sexually transmitted diseases, mainly HIV/AIDS are provided.
- Conducting periodic health surveys of the project area together with the designated staff from health centres.

9.3.4. Noise and Dust

There will be noise and dust impacts associated with residential unit construction and camp site development close to settlements with in the project command area. Therefore, the environmental supervisor has to monitor the implementation of proposed mitigation measures to cover noise and dust impact land clearing and levelling etc.

Table 12: Environmental and Social Management Plan

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated Cost, USD**
Accessibility and mobility would be enhanced in the Project Area contributing to the enhancement of socio-economic welfare of the people	The Road should be maintained timely (on regular basis) during operation to keep accessibility and mobility to the level required.	RDA	[To be] yearly estimated budget depending on work load
The Road contributes to (new) induced development in the area.	Investors interested in the area should be encouraged through provision of incentives and facilitating the formalities through increased bureaucratic efficiency.	Local Administrations at different levels, Investment Office	Not Applicable
The Road requires additional (expropriated) land when upgraded	• The design should provide the minimum possible land acquisition (for ex., the RoW (right of way) width can be made 30 m in urban areas and 20	Designer, and RDA	• Part of Design Cost; • Cost to be included in RAP

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated Cost, USD**
	m in rural settings); and • Adequate compensations should be paid for properties on land to be taken inevitably		
Properties of project affected people-PAPs (in rural and urban areas) could be expropriated	• The design should consider minimum expropriation of properties like houses; • Adequate compensations should be paid for properties to be expropriated; and • Resettlement of affected PAPs should be conducted as per the existing Laws and Legislations	Designer, RDA Local	• Part of Design Cost; • Cost to be included in RAP
Vegetation within the RoW (right of	• The right-of-way (RoW) should be kept	Designer, RDA,	Included in Design and

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated Cost, USD**
way) of the Road would be removed (minor deforestation)	to the minimum practicable (like reducing to minimum of 20 m) especially in the upland bush land areas; • Adequate monetary compensation should be made for homestead plantation to be removed within the RoW of the Project Road or access roads; and • Planting (esp. indigenous) tree species (by the contractor) in lieu of those cut	Contractor, Supervisor	RAP costs;
Impediment to movement of wildlife and accidents involving wildlife (especially on the upland vegetation areas and wild	• Public awareness (esp. for drivers) should be conducted for cases wildlife are encountered along the road;	National Wildlife Office Contractor,	4000

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated Cost, USD**
life reserve areas) including human and livestock	• Appropriate traffic signs should be installed at such critical sites. • Legal enforcement should be implemented seriously	Supervisor	

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated Cost ,USD**
Improvement in Health (Eye and Respiratory Diseases)	Upgrading the road from gravel to asphalt surface and maintaining it on sustainable basis	RDA, Contractor, Supervisor	N/A
Modification or disruption of natural drainage pattern of the area	The existing road in a very poor condition, construction of drainage structures (including bridges) should be made with minimum effect on the aquatic life (in case the flow direction of rivers should be made temporarily).	Contractor	Part of construction cost
Initiates or aggravates soil erosion on fresh cuts, embankments, quarries, borrows,	• The design should provide slopes as gentle as possible • Recommend minimum number of quarries and	Contractor	100,000

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated Cost ,USD**
access roads, detours, etc.	borrow pit areas based on test result • The design should consider physical structures like check dams in primary and turn-out ditches aprons, ripraps, etc. after culvert outlets.		
Vegetation removal along the Road (within right-of-way), access roads, quarries, borrow areas, etc.	• The right-of-way (RoW) should be kept to the minimum practicable especially in forest areas • The design should consider preserving indigenous isolated/individual trees close to the road (on both tangent as well as curve sections) • Access roads and detours should follow, as much as possible, corridors without or with minimum vegetation cover • Quarry sites and borrow pits should be located, to the extent possible, at places without or with	Designer Contractor	350,000

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated Cost ,USD**
	minimum vegetation cover • Tree planting to compensate the lost ones		

CONSTRUCTION

Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
With improvement of the riding quality of the road after implementation, traffic accidents are expected to increase due to drivers being tempted by the improved road surface.	Traffic calming structures such as rumble strips and humps/bumps should be designed for major towns and populated villages.	Designer	Part of design cost
Impact on wetlands	The road, to the extent possible, should avoid the wetlands along the route corridor(eg.ponds)	Designer	Part of Design Cost;
Construction creates job opportunities for the local labor contributing to poverty alleviation	The contractor should be advised towards local labor preference for appropriate jobs (with preference and encouragement to women depending on the suitability of the jobs)	RDA[1]Contractor, Supervisor, Local Labor Office,	Not applicable
Formation of gullies & flooding	Structures such as check dams and scour checks should be constructed (from	Contractor, Supervisor	250,000

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
	cheap and local materials like stones wood, etc.) on the downstream side of culverts and along turn-out ditches • Line road side run off ways • Design and construct culverts and pipes that have adequate openings to pass the design flood in order to minimize scouring and erosion downstream structures • Construct energy dissipating structures at the drainage outlets and discharging points		

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
	• Construction of turn out ditches to reduce the amount of flow and travel length of flow parallel to the road • Rehabilitate existing gullies • Design road side drainage structures in a such way that it can carry all the possible run off • Provision of cross drainage structures as close as possible to reduce the amount of flow from side ditches and to let the flood join to the nearest stream easily		
Pollution of surface and ground water as a	• The contractor should limit most of the	RDA,	50,000

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
result of earthwork operations and improper handling of hazardous materials	earthwork to the dry season • Used oil and lubricants from garages should be collected in sealed containers (through the proposed process and disposed for recycling or reuse; • Fuel, lubricants and oils should be stored in containers that do not leak	Contractor, Supervisor	
Conflict on the Water(impact on water resource completion with locals)	Providing and developing shallow wells as alternatives particularly near the town section where there are water deficit and sustain those for community use in the future	Contractor	600,000
Encroachment into forest areas in search of fuel wood	The contractor staff should aware to obtain fuel wood from commercial	Contractor, Supervisor	N/A

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
	sources or use other energy alternatives.		
Poaching (for bush meat).	The contractor should prohibit the workers from poaching and the Engineer (supervisor) should follow-up on the implementation of same. The contractor should aware the construction workforce that poaching and illegal hunting is prohibited.	Contractor, Supervisor	N/A
Impact on wild life	Totally avoid access roads, quarry site, and borrow pit and installation of crusher plant on the wild life corridor, water points dense forest areas. Use traffic management by constructing half of the road while the other half used	Somaliland Wildlife Office, Contractor, Supervisor	250,000

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
	for traffic movement. Avoid horn and noise on the wild life corridors. The work force should not hunt wild animals for food or sport. Provide speed break every 1 km Respect the park rules and regulations, if any. Allot budget for training of the park personnel to build their protection and management capacity		

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
Conflict between local and migrant workers	The contractor should be advised towards local labor preference for appropriate jobs (mostly the unskilled labor) and settle, as immediately as possible, any dispute amicably.	RDA Contractor, Supervisor, Local Administration	N/A
Spread of HIV/AIDS in and around construction sites due to presence of large number of concentrated workers in one area (labor camps)	A firm (such as a local NGO) should be given a sub-contract for activities (ranging from awareness creation to conducting voluntary counseling and testing-VCT) to prevent and control of the spread of HIV/AIDS at workplaces	Contractor, Sub-contractor, Supervisor, Local Administration, Local Health Office	100,000
Spread of diseases related to poor	• Camps and workplaces should be kept	Contractor,	65,000

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
condition of sanitation in construction site(s)	clean • Workers should be given awareness (knowledge) on basic sanitation • Water should be made potable (at least through boiling if there are no other means of treatment) • Wastes of all types should be disposed properly	Supervisor, Local Health Office	
Traffic accidents as a result of poor traffic management activities in construction site(s).	• Roadway should not be reduced or blocked with stockpiles or windrows for long time • Flagmen should be assigned to let the traffic flow safely especially at narrow/critical sites	Contractor, Supervisor, Local Police	20,000

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
	• Slippery and other dangerous spots should be maintained or corrected frequently		
Possibility of water logging in quarry sites and borrow pits becoming the breeding ground for mosquitoes that cause malaria (already the number one health problem in the area)	• Water in such sites should be inspected regularly against stagnation • Water in quarries and borrow pits should be spilled away as the contour allows • Quarry sites and borrow areas should be reinstated immediately after exploitation	Contractor, Supervisor, Local Health Office	20,000
Spoil materials on vegetation and grazing lands, if kept for a long time, jeopardize the	Material for spoil or later use should not stay for a long time covering vegetation	Contractor, Supervisor	Part of construction cost

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
life of the vegetation underneath.	and should be removed in short period and the Engineer should supervise closely		
Problems associated with noise, vibration and air pollution especially from heavy duty construction machinery	• Heavy duty machinery should be operated near settlements during day times only • Effect of vibration on structures of special importance should be well considered • Structures should be compensated for impacts from vibrations • Vehicles of the contractor should be serviced timely	Contractor, Supervisor	Part of construction cost
Improper waste (solid as well as liquid)	• Latrines and septic tanks should be	Contractor,	30,000

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
management will cause health problems	sealed not to leak into the soil • Solid wastes should be disposed properly (to landfill, incineration, etc.) generally following waste disposal hierarchy • Reuse of materials like plastic bags should be practiced as it contributes to waste reduction • Clinical wastes should be burned in exclusive chambers	Supervisor, Local Health Office	
Change in landscape and aesthetics due to cuts, spoil materials, etc.	Spoil materials should be disposed at selected sites (preferably as land fill to waste land), and agreed by the Engineer, not to block sceneries	Contractor, Supervisor	Part of construction cost

CONSTRUCTION			
Predicted Impacts	**Enhancement/Mitigation Measures**	**Responsible Body**	**Estimated cost, USD**
Total Construction Phase			**USD 1,610,400**

OPERATION			
Predicted Impacts	***Enhancement/Mitigation Measures***	***Responsible Body***	***Estimated cost, Birr***
Vehicle operating Costs are expected to decrease as a result of improved road (surface) condition.	Road maintenance should be done regularly to avoid further deterioration (basics of road maintenance policy) and adverse effect on vehicle performance	RDA	Annual Budget depending on prevailing condition
Noise would be a problem especially for those close to the road during the night time	Trees should be planted on road sides especially in urban areas as they somehow contribute to reduction in noise level (depending on their species) when grow up and appropriate traffic sign for noise protection	RDA-, Local Agriculture Office	Annual Budget
There is a possibility that accidents increase due to improved riding quality of	• Humps and rumble strips provided should be maintained as required and new ones	RDA	Annual Budget

the road that tempts drivers to (over) speed	on new sites if identified as requiring in this phase • The principles of Engineering, Education and Enforcement should be practiced at different areas and levels		
Spills from hazardous materials like fuel and oil during transportation would cause soil contamination	Adequacy of vehicles transporting hazardous materials should be checked at their origins; Appropriate traffic signs should be erected to inform and warn vehicles about the road they are using; Awareness /education should be given to drivers engaged in transportation of hazardous materials	RDA	Annual Budget
Runoff (discharge) from pavement or drainage structures would cause or aggravate erosion through formation of gullies in longitudinal or transverse	• Constructed (existing) structures should be maintained regularly • New structures should be constructed for new areas where erosion has already	RDA	Annual Budget

directions	commenced • Gully sides/slopes may be used for growing trees or perennial fruit trees, etc., especially where land is scarce		
Impacts of Coastal land plain Activities on Red Sea	• Install mobile toilets and solid waste disposal barrels in areas where bus stop bay areas • Implement all the mitigation measures related to erosion and sedimentation impacts to minimize sediment load especially on the upland plain and mountainous zones. • Implement grassing alongside the road as sediment trap • Avoid car washing and change of	RDA	Annual Budget

	used oil in the marginal land of the sea		
Total Operation Phase			**Annual Budget**

10. STAKEHOLDER ENGAGEMENT AND PUBLIC PARTICIPATION

10.1. Identification of Stakeholders

For the assessed Project, the other categories of primary stakeholders were identified as neighbors such as the community. Secondary Stakeholders were identified as government and Regional and respective town administrations in charge of diverse sectors, and people who will be impacted by the project. This category was also consulted as key informants on sectorial policy, sectorial baseline information development and to advise this ESIA study on mitigation measures to be put in place so as to minimize future impacts in respective sectors. In this category also included local policy makers and Regional officials.

Major stakeholders identified with whom consultation was made include:

- Ministry of Transport and Road development
- Road and Transport Agency (RDA)
- Boroma Region and major institutions (health, education, water)
- NGO's (International Refuge Council (IRC), World Food Program (WFP)

10.2. Consultation Processes and Outputs

As part of the social assessment public consultations were carried out in the study area, in the Hargeisa, the capital of republic of Somaliland at National level, Regional State and District and/or towns level including, Borama, Zeyila, Bon and Lowyaddo towns. Concerned stakeholders including representatives of the local communities, administrators, representatives of different sector bureaus and different offices of the above specified area were consulted. The main reasons, for carrying the consultation were:

- To gather the opinions and attitudes of the community towards the project.
- To ensure community participation in such development projects.

- To identify anticipated project impact on the socio-cultural life of the community.
- To obtain commitment of the respective offices/authorities in providing support and cooperation during project planning and through project implementation.
- To ensure that their voices are heard and their views integrated with regard to the project

Consistent discussions and/or meetings have been taken place in Borama (Awdal Region capital), Bon district, Zyiela (Selel Region Capital) and Lowyaddo town (border town to Djibouti). Moreover the benefit of the proposed project had been described to the local communities and administrators adequately and the issues and interest of the communities have been heard and incorporated. The discussions were facilitated by the team of consultants and the discussion points include:

- Briefing about the development plan to implement the road project.
- Propose possible routes and select the best route
- Discuss about the effect of road development on properties and compensation issues for the PAPs
- Determination of town section width and length
- Getting the opinions and attitudes of the local community towards the proposed project.
- Anticipated positive impacts of the project on socio-economic life of the community.
- The need of community participation at different stages of project activities.
- The means to avoid and/or mitigate anticipated adverse impacts of the proposed project.

The outcomes of the meetings include:

- In general, the consulted officials appreciated the planned road project and highlighted its benefits to the local communities. The meeting participant underlined that construction of the proposed road has a paramount importance for their economic and social development. The local officials' and community representatives believe that construction of the proposed road will bring socio-economic improvement in the Region and in the country as a whole.
- The participants of the community and states also present their interest concerning the route. They all insisted, except Bon town dwellers, that we follow as much as possible the existing road

underlining socioeconomic importance of the route that gives access to a larger settlement around the project route.

Although the discussions were held at different levels, very similar opinions were expressed with regard to most the points of discussion mentioned above. The discussions were also concerned on the negative and the positive impacts of the project. The following points reflect the general opinion of the consulted community on various positive and negative aspects of the project.

The envisaged Lowyaddo-Borama road project will solve the problem as it introduces asphalt road, which is safer and good riding quality road. People are looking for better access to get better health facilities, market and enhance their economy in general. The present road is impacting their desire because it was taking long time to get their neighbouring towns and State and County administration divisions. Hence they expressed that they are glad to see this development project becoming operational in the near future. Apart from employment opportunity, some of the expectation by the people from the project is that it would help in giving training on best income generating practices such as on diversification of small holders business. Furthermore the following positive and negative impacts were speculated by the local people /administrators and consultants elaborations.

10.3. Summery Consultation Outputs

10.3.1. summery of consultation conducted in Borama, Bon, Zieyla and Lowyaddo

Lowiyaddo and Zeyila

- The Lowyaddo attendants underlined the route should go via Zeyila town as it is the historical port and Regional capital of Selel.

- We understand the benefits of the road; therefore they will work together to support this development in terms of security, society and environmental aspects
- The centreline of the road should be designed so as to keep trees and houses; otherwise Project Affected Peoples (PAPs) need to get compensation.
- The width and length of town sections shall be determined by the design consultant based on the RDA design manual.
- The “cut of date” shall be decided after the alignment centreline is known.
- PAPs need to be compensated by identifying, registering and implementing compensation process based on the Republic of Somaliland rules and regulations.

Bon

- The ideas are almost similar to the outputs of LowyaddoLowyaddo and Zeyila in all the above aspects except their attitudes given on the alignment of the route.
- In Bon consultation has been conducted twice in the first consultation made on March (17/03/2021) the group attended on the meeting have proposed the route should to follow the existing alignment passing through the central gravity of Bon town. However during the 2nd meeting conducted on 6/09/2021; the locals have decided the route should follow the periphery of the town deflecting LHS running alongside the Al-Higma secondary school and joins the existing alignment on the outskirt of the town.

Borama

- The ideas are almost similar to the outputs of LowyaddoLowyaddo and Zeyila in all the above aspects except their attitudes given on the alignment of the route.
- The end point of the project was in the outskirt of the Borama town however the local administration both Regional and Borama Town Municipality suggested to shift the end point should reach to the central gravity of the Borama town, located in front of the Borama Health centre.

Figure 13: Pictures illustrating consultation

Consultaion with Zeyila; Selel Region adminstraion

Consultation with the LowyaddoLowyaddo town administration

Consultation with Bon district/town administration and dwellers

Consutation with Ministry of Transport and Road Development and RDA (Top) and Ministry of Environment (bottom)




Consultation in Borama, Awdal Region Capital(Regional Governor (top) and Borama Municipality (bottom)

10.3.2. Gender Mainstreaming

Women in all areas of the project bear the brunt of domestic work with respect to food processing, childcare and household maintenance. The working day for women usually involves getting up before the men to prepare food, fetch water and collect wood for fuel.

Women are actively involved in the household economic activities as it is expected of them. Their role is determined by the particular economic activity in which the household is involved.

In the community where the major economic activity is farming and/or mixed farming, women participate in all farm activities except ploughing. The main activities include land preparation, weeding, and harvesting and transporting products home and fetching water. In terms of livestock rearing, women are also involved in milking cows and cleaning barns.

In the project area women were observed also carrying some products on either their shoulders or heads to the market. The construction of the road will reduce the burden imposed and waste valuable time, the time which could otherwise have been used in productive activities.

Lack of education, early marriage and deprivation of decision making are the main negative social impacts of female population in the road project areas. Men normally control ownership of land and livestock. Wives are usually unable to sell assets without the knowledge and consent of their husbands. Men are the main decision makers and have exclusive control over community and political affairs. Women are normally not involved in community affairs unless they are household heads.

The construction of the road has tremendous impacts on the women that can be both negative and positive, with outweighing positive impacts. The positive impacts include: increased access to health facilities for pregnant women, reduce head loading or work load on women through the reduction of distance to other facilities like grain mill, market places etc. Some bad cultures regarding women will be avoided; increase access to educational facilities thereby empowers women.

10.3.3. Grievance Redressing Mechanisms

9.3.3.1. Process Steps for Grievance Management

- Step 1: Publicizing Grievance Management Procedures
- Step 2: Receiving and Keeping Track of Grievances
- Step 3: Reviewing and Investigating Grievances

- Step 4: Developing Resolution Options and Preparing a Response
- Step 5: Monitoring, Reporting, and Evaluating a Grievance Mechanism

9.3.3.2. Compensation for Environmental Damages

Since the project is expected to follow the African Development Bank and World Bank (WB) emission standards, therefore, it is required to operate at least 95 % of its operational time in compliance with the required emission standards of the ADB/WB. This ensures that the project operation is legally bound to observe all legal requirements to avoid damaging the environment around the project. The likely damages to be caused to any sector of the environment or property or else will need to be paid to the affected parties.

There is complete legal cover to address issues related to compensation for any environmental damage arising out of project activity. However, to address any such issues more expeditiously, the Project Administration will have a local committee as an Informal Mechanism. This informal mechanism will provide convenient, quick and cost effective decisions for compensation against any environmental damages that occur from the project activity. This informal mechanism will also build confidence between the Project Administration and public and safeguard the interests of both the project and the public at large.

11. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this environmental and social impact analysis, the road development project will have several beneficial aspects within the area of influence. The development of the project will improve the livelihood of the surrounding community through creating job opportunity and food security and development of socio-economical services.

The project in general will not cause such environmental effects that cannot be minimised with normal good management practices and with integrating some environmental and social mitigation measures in the planning and execution of the project. About **USD 1,610,400** will be required for the implementation of the socio-environmental impact mitigation measures and the management plan.

11.1. Key Aspects to Include in Bidding Documents

Concerning socio-environmental aspects of the road, the tender document for the road construction contract should include the following but not limited to:

- Watering while constructing the main and access roads to suppress the dust impact on the settlement area and vegetation.
- The road construction programme should be programmed for maximum effort during the dry season to reduce the environmental damage, soil and sediment loading to streams.
- Side tipping of excavation materials on slopes or in adjacent agricultural lands should be avoided or minimized by spoiling only in heaps approved by the supervisor, and the sites landscaped and planted with appropriate plant species after construction to improve the aesthetic value of these sites.
- The land taken for detours should be reinstated to its productive state when construction is completed by removing the applied selected material, ploughing and covering with topsoil.
- Establishing construction campsite with appropriate and standard sanitation facilities to reduce possible pollution impact on ground and surface water resources.

- Restating/rehabilitating and re drain of borrow and quarry sites after the completion of construction to reclaim the affected environment and to reduce malarial outbreak through reduction of mosquito breeding sites.
- Controls on the use of water for construction purposes particularly during the dry season, such as the source and amount, will need to be established in order to avoid potential conflicts with local human and livestock uses.
- Give job opportunities for the local people as much as possible, giving priority for the affected people.
- Handling of explosives and residue of fuel to avoid health risk and water pollution.
- Give attention for the roadside trees, particularly for the endangered trees such as, Acacia and economically important trees. Wherever these trees are encountered, the contractor should take maximum care to save them. Take responsibility to create awareness among the work force about the protection of natural environment, maintaining the vegetation and wild life, keeping water sources clean etc.
- Create awareness that the road traverses through malarial areas and people should be prepared to avoid possible health risk through environmental health and hygiene management of camp sites and availing clinics, chemically treated mosquito nets and medicines for the work force.
- Restabilise unstable slopes, and construct flow speed breakers at the discharging points of the major culverts and conduits to reduce erosion risk.
- Work agreed with the supervisor and site engineer in implementing the environmental mitigation measures specified in ESIA report.
- Prepare and apply appropriate traffic management plans, particularly in congested towns and villages, and at critical places.

Finally, the construction contractor should present management plan for:

- Camp site construction and management.
- Water resource use plan for construction.
- Quarry and borrow site management and rehabilitation plan.
- Health and risk management plan.
- Dust and pollution control and management plan.
- Blasting and crashing plant management plan.
- Clearing up plan after the completion of the construction work.

11.2. Recommendations

11.2.1.. Environmental Aspects

Most of the environmental effects will be of temporary and reversible nature, but some will be permanent impacts. They stem from land acquisition and ground disturbance for the road construction and for obtaining construction materials, as well as operation of construction equipment and camps or housing of the labour force. The negative effects can be reduced to acceptable levels with good engineering practices and integration of restoration and other mitigation measures in the planning and implementation of the project. Therefore, it can be concluded that there will be no severe or immitigable impacts that will prevent the implementation of the road rehabilitation and upgrading project.

To have minimal and acceptable residual environmental impacts, it is recommended that the proposed mitigation measures be properly implemented by including them in the Tender Documents for the Contractor and through an Environmental Management Plan. A close follow up of the effectiveness of the implemented measures through a well-planned monitoring programme is also critically important. Among the issues that should be given maximum attention are:

- RDA should appoint an Environmentalist or equivalent to supervise environmental monitoring and management activities of the road, and to ensure that contractors utilize methods that protect the

environment. It will be important also to include environmental requirements in the contract specifications so that adequate budget will be allocated.

- Implementation of erosion control measures by designing and constructing appropriate physical/engineering structures, and by implementing biological (re-vegetation) measures, as well as by instituting follow up procedures to repair defects.
- Application of good practices during the road construction and collection and hauling of water and selected materials to minimize unwanted impacts on the environment.
- Maximum care must be taken to implement the mitigation measures proposed for sections along the corridor transecting along the road
- Maximum care must be taken for sections that involve cut-and-fill in steep slopes.
- Effective storm water management systems and structures must be put in place throughout the project area.
- Impacts on water supply sources of the local communities and their animals must be kept to a minimum.
- Restricting land acquisition to what is absolutely necessary to reduce loss of land and vegetation/forest.
- Proper sitting of construction camps and management of workforce, and restoration of the sites to blend with the surrounding environment as soon as the construction work is completed.
- Proper management of construction machinery and control of traffic.
- In locating the alignment, besides the technical issues, environmental considerations have been given due attention in order to minimise adverse environmental effects.

11.2.2. Socio-Economic Aspects

The positive impact of the project will be felt at both the construction and operation stages. During construction, the benefits will be mainly related to business activities and employment opportunities. By this it is considered that persons who reside in towns and villages along the road will profit from business

activities created by the contractor. Employment opportunities will probably be restricted to the hiring of unskilled labourers who will be actively involved in the construction processes and will thereby gain income and knowledge.

During the operation period, there will be multifaceted benefits to both the communities in the immediate project vicinity and the surrounding area. For those who depend on agriculture for their livelihood, the benefit will derive from improved access to markets, products, and timely access to agricultural inputs as and when they are required. During the operation period, it is believed that the project areas and the surrounding communities will be readily able to take their product to the best market and, similarly, these communities could get agricultural inputs at the local market at reasonable prices, thereby encouraging increased production.

In terms of health services, the project is also considered to have a great benefit mainly by improving access to hospitals and/or health centres. There will also be a negative impact due to increases in STDs, especially HIV/AIDS. This can be mitigated by education and sensitising the local population.

Investment activities will be improved as a result of improved access from the project area to the market centre.

On the other hand, with regard to adverse consequences of the project, the most important impact on socio-economic life is the loss of property, in particular the loss of housing units. However, these will be small in number and the negative impact can be mitigated by the payment of suitable compensation.

Because of the benefits of the project, it is considered that project area communities will be keen to ensure that the project road is completed successfully.

Based on the socio-cultural assessment, the following recommendation should be implemented to ensure the sustainability of the road project:

- Project area communities should be actively encouraged to participate in the construction and implementation of the project. This participation should start from provision of necessary data and information pertaining to the project activities. Such participation should take account of the contributions that can be made by women at every level.
- Project area communities and stakeholders should be consulted from time to time, particularly before and during the construction period, to find appropriate mitigating measures for adverse impacts, and to implement them accordingly.

- The involvement of stakeholders is essential. The local administration, namely City, administration and Town administration will be very helpful in facilitating the project activities through solving problems related to land acquisition, settlement of disputes and security.

- The schedule of construction needs should be communicated to the concerned bodies at the earliest possible opportunity, to allow affected households time to prepare themselves physically and mentally to participate and co-operate with the project activities.

12. ANNEX

ANNEX I List of Contacted Officials/Persons

No	Name of Contacted person	Responsibility	Tel. No.
1	Shukri Haji Ismaiel Muhammed	Ministry of Environment and Rural devpt, Minster	+252 634426085
2	Abdunasir Ahmed Hersi	Ministry of Environment and Rural devpt, Director General	+252 63 4200386
3	Ali Husen Nur	Ministry of Livestock and Fishery Devpt, Director General	
4	Eng. Abdukerim Omar Hussein	Road Development Agency (RDA), Technical Director	252 63 4426217
5	Muhammad Ahmed Muhammad	Ministry of Investment and Promotion, Minister	252 6363633017
6	Abdurrahman Osman lyhe	Ministry of Education and Science in Awdal Region	252 63 4242211
7	Mr. Muhammad Musa Budin	Head of planning, Education	252 63 4458724
8	Mr. Adan Farah	Ministry of Education and Science, Awdal region	252 63 4456454
9	Farha abdulsemed Osman	Primary Health Coordinator	252 63 4457866
10	Mrs. Rahima Abdu Humer	Human resource Head	252 63 4626549

ANNEX II Response to Comments from ADB

LOWYADDO-FARDDAHA-BORAMA ROAD

ENVIRONMENTAL AND SOCIAL IMPACTS ASSESSMENT STUDY REPORT

RESPONSE TO ADDITIONAL REVIEW COMMENTS

No	COMMENTS	RESPONSE TO COMMENTS
1	**Chapter 1: Introduction**: Please make Section 1.3: The Project Road a chapter on its own. In this chapter you discuss the various components of the project. Discuss also the various activities that will be carried out during the implementation of the project. This chapter is very important because it forms the basis of the whole ESIA study and report. It is the components and activities that will result into impacts that are being studied. Let Section 1.4: Project Visual Assessment be part of this chapter.	Core Project activities and ancillary facilities are discussed under page 22 and page 23 paragraph 1
2	**Chapter 6: Potential Impacts**: There is great need to beef up this chapter. Discuss in details the identified impacts that will come about as the result of constructing the road. Some of the impacts addressed in Chapter 7 – Mitigation and Enhancement Measures are not discussed in Chapter 6. Possibly they are just mentioned.	The potential impacts are listed on page 92 and general discussion is given under page 93 section 7.5 The detail discussion of each impacts is given under Chapter 8 Mitigation and Enhancement Measures
3	**Chapter 7: Mitigation and Enhancement Measures**: Part 7.3:	Those impacts are not hypothetical, rather they attribute to project activities include: Influx of construction work

No	COMMENTS	RESPONSE TO COMMENTS
	Negative Impacts. There is need to focus on the impacts that are directly attributable to the project rather than hypothetical impacts. For example, Part 7.3.8: Impacts of Public Health and Safety. The way they are discussed, they remain hypothetical. They are not discussed in a manner that relates them to the project – road construction. Part 7.3.9: Impacts of Clinical Waste. These impacts as discussed are not directly attributable to the project.	force and health impacts related to malaria. **A. Impacts of Public Health and Safety** • The project is very large and there will be INFLUX of large number of construction work force who will be intermingled with the host community. This will induce sexually transmitted diseases including HIV. • Creation of ponds/holes left because of un-rehabilitated material production sites will be a breeding ground for mosquitoes and a medium for transition of malaria. **B. Impacts of Clinical Waste**. In projects where there exist a large number of construction work force, the establishment of Clinic mandatory. However such clinics will not be expected as such to induce impacts due to clinical waste as they are manageable. However this comment was given by the Client since February 2022 asking for incorporation of Clinical waste and its impacts and the consultant did the same.

No	COMMENTS	RESPONSE TO COMMENTS
4	**Chapter 8: Environmental and Social Management Plan (ESMP)**	
	1. Attribute responsibility for the various aspects of the mitigation measures – i.e. who is responsible for ensuring the measures are addressed?	**It is given on Table 13**: Environmental and Social Management Plan
	2. Assign the cost aspects. Remember that the total ESMP management cost should be between 1% and 3% of the total project cost.	Since some costs are part of the construction and annual budget RDA it can be adjusted to the proposed figure.
5	Consider discussing Complementary Initiatives and Complementary Benefits of the project. Can develop a chapter for this. These are initiatives and benefits that will come about as a result of the project road – they are indirect positive impacts and benefits.	Positive impacts are listed under chapter 7 and discussed in detail in chapter 8. Please refer those chapters.