2021

Preliminary ESIA for Model Regional Logistics Hub in Ovorkhangai aimag

FOR MONGOLIA TRANSPORT CONNECTIVITY AND LOGISTICS IMPROVEMENT PROJECT (P174806)

CONTENTS

1. Introduction

The proposed Mongolia Transport Connectivity and Logistics Improvement Project aims to improve climate resilient transport connectivity and logistics efficiency for the meat value chain in Mongolia. By tackling the shortfalls in physical connectivity, cold chain storage, and logistics and supply chain information asymmetry, the project will introduce a new way to tackle the enduring shortfalls in the country's efforts to diversify the economy. The project also provides technical assistance and capacity building to improve transport services and logistics efficiency for the long term.

The proposed Mongolia Transport Connectivity and Logistics Improvement Project consists of a complementary set of interventions that address the three major drivers of logistics costs in the meat value chain—namely poor physical connectivity, lack of strategically located and efficient logistics hubs, and information asymmetry between the various actors in the supply chain. The project has four components. ***Subcomponent 2.1: Model regional logistics hub*** is one of the key subcomponents. This subcomponent will finance the development of a model regional logistics hub. It addresses the constraint related to a lack of properly designed facilities for logistics activities in a "hub-and-spoke" configuration. The regional hub will provide facilities for consolidation to address the fragmentation that currently constrains the potential of the meat value chain. The intervention will reduce the need for small, partially loaded trucks without temperature control mechanisms, which currently lead to significant loss of product quality.

Ultimately, Mongolia will need to have strategically located hubs to support an overall network of hubs and spokes to facilitate the domestic and export markets once the issues of consistent quality, quantity, and reliability of products are addressed. Eight strategic locations form part of this network of connected roads and hubs. For demonstration purposes, the regional hub in Overkhanghai *aimag* will be financed under this project and provide a direct link to the domestic market in Ulaanbaatar. It was chosen based on multicriteria related to location, volumes, connectivity, and alignment with the Government of Mongolia's development plans.

2. Legal and Institutional Framework

2.1. Mongolian laws and regulation

Table 1. National laws relevant to the project

Current Laws	Latest Changes
Law on Environmental Protection	Amended, 2019
Law on Environmental Impact Assessment	Amended, 2012
Law on Development Policy Planning	Enacted, 2015
Law on Air	Amended, 2012
Law on Fees for Air Pollution	Amended, 2012
Law on Water	Amended, 2015
Law on Water Pollution Fees	Enacted, 2012
Law on Fees for the Use of Natural Resources	Amended, 2012
Law on Forests	Amended, 2012
Law on Waste Management	Amended, 2017
Law on Hazardous Substances and Chemicals	Amended, 2006
Law on Land	Amended, 2015
Law on Land Fees	Amended 2012
Civil Code of Mongolia	Amended 2014
Law on Cadastral Mapping and Land Cadastral	Amended 2011
Law on Subsoil	Amended, 1995
Law on Soil Protection and Combating Desertification	Created, 2012
Law on Special Protected area	Amended, 2014
Law on Buffer Zones	Enacted, 1997
Law on Protection of Plants	Amended, 2011
Law on Natural Plants	Amended, 2012
Law on Fauna	Amended, 2012
Law on Minerals	Amended 2015
Law on Fire Safety	Amended, 2015
Law on Disaster Protection	Amended, 2012
Law on Sanitation	Amended, 2012
Law on Protection of Cultural Heritage	Amended 2014
Law on Labor Safety and Hygiene	Amended, 2015
Law on Occupational Health and Safety	Amended, 2021
Law on Promotion of Gender Equality	Amended, 2021
Law on Road	Amended, 2017
Law on Construction	Amended, 2021
Law on Allocation of Land to Private Citizens	Amended, 2018
The Civil Code of Mongolia (Land in the ROW)	Amended, 2021

Herders and cooperation

Pastureland use agreements can be enforced based on the Article 327 of the Civil Code, the Article 52.2 of the Land Law, Articles 17.1.5 and 17.2.7 of the Environmental Protection Law. Relevant laws on rights of unregistered unions and local partnerships, regulation on pastureland management, land payment exemption for herders, animal diseases, use of hay and vegetation for livestock are listed in Table 2.

Table 1 List of relevant law for Herders and pastureland management (Source: Centre for Policy Research, 2018)

Current Laws	Latest Changes
Constitution (Article 5,6)	Amended, 2019
Civil Code (327 and 481)	Amended, 2021
Law on Land (6.2, 42, 43 and 52)	Amended, 2021
Law on Land Payment (Article 8)	Amended, 2021
Law on Budget (58 and 60)	Amended, 2021
Procedure on Local development fund (Article 60)	Amended, 2021
Law on natural plants (3, 6, 7, 14)	Amended, 2015
Law on natural resource use fees (5, 9)	Amended, 2017
Law on Soil Protection and Preventing Desertification (Article 7)	Amended, 2015
Law on Environmental Protection (Articles 3 and 17)	Amended, 2019
Law on Livestock Health	Enacted, 2017
Livestock gene pool	Amended, 2020

Table 2 List of National Law relevant to the project

The environmental impact assessment (EIA) requirements of Mongolia are regulated by the Law on Environmental Impact Assessment (2012). The purpose of this law is to protect the environment, prevent ecological imbalance, ensure minimal adverse impacts on the environment from the use of natural resources, and regulate relations that may arise in connection with the assessment of environmental impacts of and approval decisions on regional and sectorial policies, development programs and plans and projects.

There are two types of EIAs defined in the EIA law:

(i) General EIA (screening) - to initiate a General EIA, the project implementer submits to Ministry of Environment and Tourism (MET) (or Aimag government) a brief description of the project including feasibility study, technical details, drawings, and other information. The General EIA may lead to one of four conclusions: (i) no detailed EIA is necessary, (ii) the project may be completed pursuant to specific conditions, (iii) a Detailed EIA is necessary, or (iv) project cancellation. The General EIA is free and usually takes up to 14 working days.

(ii) Detailed EIA – the scope is defined by the General EIA. The Detailed EIA report must be produced by a Mongolian company which is authorized by the MET by means of a special procedure. The developer of the Detailed EIA should submit it to the MET (or *Aimag* government). An expert of the organization who was involved in conducting General EIA should make a review of the Detailed EIA within 18 days and present it to MET (or *Aimag* government). Based on the conclusion of the expert, the MET (or *Aimag* government) takes a decision about approval or disapproval of the project.

(iii) The Detailed EIA must contain the following chapters: (i) Environmental baseline data; (ii) Project alternatives; (iii) Recommendations for minimizing, mitigation and elimination of impacts; (iv) Analysis of extent and distribution of adverse impacts and their consequences; (v) Risk assessment; (vi) Environmental Protection Plan; (vii) Environmental Monitoring Program; and (viii) Opinions of residents on whether the project should be implemented. The DEIA can only be conducted by a licensed entity registered at the Ministry of Environment and Tourism.

The location, type and size of the planned activities define responsibility for the Ministry of Environment and Tourism (MET) or Aimag (provincial) government in making EIA. It is anticipated that activities planned in the Mongolia transport connectivity and logistics improvement project are likely to trigger these national law requirements.

A detailed environmental impact assessments[1] will be required for the construction of the Model Regional Hub. A baseline environmental survey, feasibility study report, and other supplementary documents [2] are required for the Ministry of Environment and Tourism to conduct a general environmental impact assessment, which will likely to require a detailed environmental impact assessment.

The establishment of a baseline for environmental monitoring is to determine trends in the quality of ambient air, water, ambient noise and soil and how that quality is affected by the release of contaminants, other anthropogenic activities, and/or by waste treatment operations (impact monitoring). Environment monitoring needs to be carried out to estimate nutrient or pollutant fluxes discharged in atmosphere or ground waters or lakes or to the land across project and nearby areas. Monitoring is done to determine the quality of the ambient Environment before start of any kind of project related activities, as it provides a means of comparison with impact monitoring. It will be also used simply to check whether any unexpected change is occurring in otherwise pristine conditions. The National Agency for Meteorology, Hydrology and Environmental Monitoring (NAMHEM) is responsible for environmental monitoring of water, air, acid deposition, soil, environmental radiation, dust-deposition and Sulphur gases to control the environmental quality. The laboratories in main cities make permanent measurements on air, water, soil quality and radiation level, meanwhile, control waste sources of pollution from such power plants and vehicles; carries necessary monitoring activities on environmental assessment; control industry wastes in cooperation with other environmental controlling organizations.

2.2. World Bank Environmental and Social Standards

The World Bank's ESF is applicable to this project, under which the relevance of environmental and social standards in the context of this project is summarized in Table 8.

Table 3 Project ESSs relevance

No.	Environmental and social standard	Relevancy	Analysis
1	ESS1. Assessment and management of environmental and social risks and impacts	Relevant	As per this standard, Ministry of Road and Transport Development (MRTD) is required of assessing, managing and monitoring environmental and social risks associated with the project.
2	ESS2. Labor and working conditions	Relevant	ESS2 is deemed relevant considering that the project involves a large number of locally sourced construction workers for road building and rehabilitation.
3	ESS3. Resource efficiency and pollution prevention	Relevant	The construction and rehabilitation of roads will have moderate impact on local environment. Direct impacts are consumption of resources, waste generation, emissions during construction phase, and moderate impact on fauna during operation phase.

[1] The DEIAs can only be conducted by a permitted entity listed on the MoET's website.
[2] The list of required documents for EIA can be accessed from e-Mongolia portal services. https://e-mongolia.mn/service/baigali-orchny-nuluulliin-yerunkhii-unelgeenii-dugnelt-

No.	Environmental and social standard	Relevancy	Analysis
4	ESS4. Community health and safety	Relevant	This standard aims to anticipate and avoid adverse impacts on the health and safety of local communities during the project implementation. Given the scale and nature of earth or road works, the project will not bring significant construction nuisance to nearby communities or affect any ecosystem services. The temporary and localized impacts of noise, dust, waste generation and traffic disturbance during the road construction and rehabilitation period could be mitigated by incorporating good civil works management practices. However, impact from material sourcing will be further assessed at implementation stage before bidding process commences. In the times of covid-19 pandemic, preventive measures shall take place during project implementation to ensure local communities are not affected by any diseases caused by labor influx associated with road construction and rehabilitation.
5	ESS5. Land acquisition, restrictions on land use and involuntary resettlement	Relevant	Land acquisition for the last mile connectivity roads is not expected. Temporary land use and land for material sourcing will be managed to minimize and mitigate negative impacts to local communities. The SEP prepared laid out procedures and steps for stakeholder identification and engagement to ensure livelihoods impact from last mile roads is minimized.
6	ESS6. Biodiversity conservation and sustainable management of living natural resources	Relevant	This standard aims to protect and conserve biodiversity and habitats, and promote sustainable management of living natural resources. According to this standard, MRTD is required to ensure that project activities do not significantly harm biodiversity and block local people's access to and use of ecosystem services.
7	ESS7. Indigenous peoples/Sub-Saharan African historically underserved traditional local communities	Relevant	This standard deems relevant since ethnic minorities are likely to be living in provinces such as Uvs who need to be consulted about the project in culturally appropriate manner prior to project appraisal.
8	ESS8. Cultural heritage	Relevant	This standard is considered relevant based on the available information and project design during preparation. The project shall employ chance find procedure to ensure no cultural heritages are destroyed during road construction and rehabilitation.
9	ESS9. Financial intermediaries	Not relevant	This standard is not relevant to the anticipated project, as MRDT will implement the project. No financial intermediaries will be involved.
10	ESS10. Stakeholder engagement and information disclosure	Relevant	MoRTD recognizes the importance of transparent and meaningful engagement with project stakeholders since it can improve the environmental and social sustainability of the project and enhance its acceptance. As per this standard, the MoRTD has developed a Stakeholder Engagement Plan (SEP) with the objective to establish a systematic approach to stakeholders' engagement, which will guide the identification of stakeholders and project affected parties, as well as building and maintaining constructive relationships throughout the project implementation.

In addition, the following EHS guidelines of the World Bank Group are considered applicable to the project, namely:

- World Bank EHS General Guidelines
- World Bank EHS Guidelines for Toll Roads
- World Bank ESF Good Practice Note (GPN) on Road Safety
- applicable World Bank Industry Sector EHS Guidelines
- Bank's ESF/Safeguards Interim Note and WHO health guidance regarding COVID-19

3. Project Description

3.1 Project scheme

At the outset it is important to clearly define the problem which the model regional logistics hub is addressing. As defined in this project, logistics includes services related to processes of planning, implementing and controlling efficient, cost effective flow and storage of raw materials, in-process inventory, finished goods and related information from point of origin to point of consumption for the purpose of conforming to customers' requirements. For the project this would include activities related to transportation, storage, packing and final dispatch along the logistics chain – often outsourced to third party contract logistics service providers but controlled by shipper. There is already an eco-system of suppliers, abattoirs and meat processors in Mongolia with various levels of service. With support from various development partners Ministry of Food, Light Industries and Agriculture have been addressing Agriculture issues related to pasture, animal health, good practice etc. to ensure a good quality product. The gaps that the transport connectivity and logistics project is plugging relate to the logistics costs and services. The regional logistics hub does not offer any agriculture services. The market failure the project addresses relates to the fact that even when high quality meat products exist (which is the realm of Agriculture), 30% of the cost can be traced to inefficiencies in the logistics chain. Of the 30% logistics costs, 50% is due to poor connectivity and the remainder is due to absence of strategically located logistics facilities and information asymmetry in the supply chain. The hub does not offer any agriculture related services. It only offers logistics services on an open access basis.

In designing the function and scope of services, preliminary market sounding and a pre-feasibility study were undertaken to understand the unique circumstances in Mongolia and the functional requirements for such a model hub. Common international practice is to combine logistics and agriculture activities in 'one-stop shop' for all activities to serve both domestic and international markets including: feedlots, slaughtering, meat and milk process, cold storage, tanning, leathering and cashmere, and commercial activities and auxiliary services. This covers both logistics and transport activities alongside Agriculture activities. Under this model the concessionaire designs and implements an unbroken cold chain of logistics for meat. As conceived the public sector land, roads, and basic utilities while the private sector invests in the super structure and associated services under a long term contractual arrangement. This 'one stop shop' model is common in many parts of the world that are large producers of meat including in USA, Australia, Brazil, Namibia, and New Zealand. It is based on the premise that consolidation of a range of related activities into a large facility allows for economies of scale and lower logistics costs.

A different approach is adopted for Mongolia based on technical advice on the unique challenges and circumstances:

- As a result of recent outbreaks of foot and mouth disease in Mongolia, new regulations have restricted the movement of live animals across jurisdictions. This means that large facilities are no longer the optimal solution. Instead, smaller decentralized facilities are more likely to achieve the objective.
- Introduction of a central 'one stop shop' hub in the semi-nomadic herding in Mongolia would significantly disrupt the way of life and 'free range' brand of Mongolia meat
- Centralized provision of animal health services is not the preferred model for Mongolia. Rather a decentralized cluster approach is preferred. This means that instead of having a

specific location where herders and traders can access animal services, the services need to be taken to source i.e. the herders

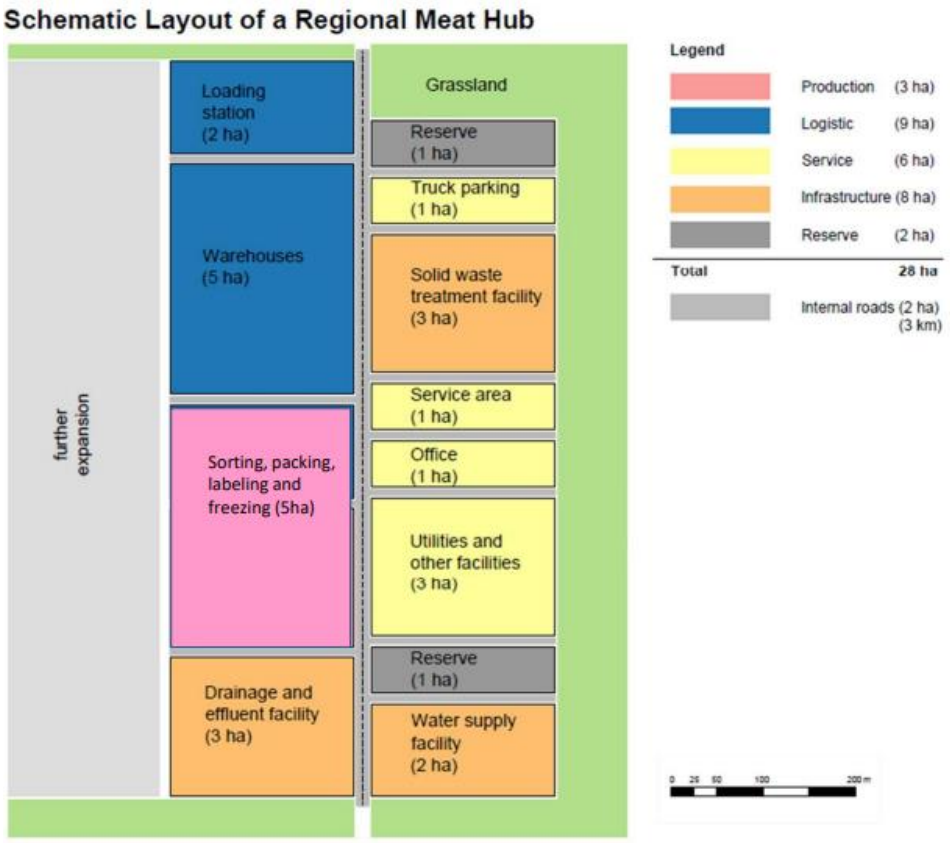
- To achieve meat quality objectives in Mongolia, harvesting of products needs to be closer to herders – slaughtering, skinning, quartering, grading etc.
- Preliminary market sounding confirmed that a phased approach to development of the sector is more desirable with the priority being development of regional hubs – rather than a central hub. In addition to acute needs being at source, the key meat categories (horse, cattle, sheep, goats) also require specific supply chain interventions which need to be handled from source rather than at intermediate stages.

For demonstration purposes, the project will finance the development ***a Model regional logistics hub*** in Overkhanghai aimag, which will provide a direct link to the domestic market in Ulaanbaatar. The specific location and design of the model regional hub will only be available during the implementation of the project. The regional hub will provide facilities for consolidation to address the fragmentation that currently constrains the potential of the meat value chain. The intervention will reduce the need for small, partially loaded trucks without temperature control mechanisms, which currently lead to significant loss of product quality. It was chosen based on multicriteria related to location, volumes, connectivity, and alignment with the Government of Mongolia's development plans.

The activities to be financed under this model regional logistics hub in Overkhanghai *aimag* include:

1. Approximately 4–5 km of internal roads within the hub
2. Facilities for docking, loading, packaging, and other value-added services
3. Truck parking space
4. Warehousing and cold-storage
5. Space for offices and ancillary services such as hostels and offices
6. Basic energy, solid waste disposal and water supply
7. ICT access
8. Access to land already owned by the Government of Mongolia. (approximately 28 hectares to be developed in phased manner)

A schematic layout of the Model regional logistics hub is shown as following, but the detail design of the hub will be only available during the project implementation. The schematic design lays out the flow of products and function of the hub. Through long term contracts, meat products are received chilled and already cut from suppliers. These are then sorted, packed and labeled for delivery to customers in the main markets or frozen for future dispatch. The hub functions similar to a fulfillment center for E-commerce and addresses a logistics challenge that has plagued Mongolia's meat supply chain



It is expected that the model regional hub would be operated under a public-private-partnership (PPP) scheme whereby the Government of Mongolia will provide the basic infrastructure listed above and the private sector would build the warehousing and freezing facilities and procure, operate, and maintain a modern trucking fleet to transport the frozen goods to markets as demanded throughout the year. The private sector would be selected based on a performance-based contract that encourages efficiencies and achieves economies of scale in the project and will be required to operate the hub on an open access basis in order to promote competition. The division of responsibilities between the public and the private is set forth in the table below.

Table x. Division of Responsibilities in the PPP regional hub

	Public	Private
Project preparation	1. Preparing the commercial transactions, including market sounding and identifying the PPP counterparty 2. Premarketing and securing expressions of interest from abattoirs 3. Preparing bid documents and the PPP contract 4. Conducting a competitive tender	

Land	Securing land and rights of way	
Access roads	Funding and constructing access roads	
Utilities	Funding and constructing information and communication technology, electricity, and wastewater facilities	
Meat processing and warehousing facilities		Designing, financing, and constructing meat-warehousing facilities
Operation and maintenance (O&M)	Monitoring O&M performance to ensure attainment of key performance indicators	Conducting O&M of the hub, including managing supply and capacity contracts from abattoirs and traders and working capital needs

The model regional logistics hub will complement ongoing and upcoming projects supported by the World Bank in the agriculture sector. Specifically, the Livestock Commercialization Project (ongoing) and Agriculture Clusters Project (under preparation FY23) will support upstream supply to the regional hubs through interventions on improving animal health.

3.2 Site Selection

The exact location of "Model Regional Logistical Hub" in Ovorkhangai aimag will be only identified during the project implementation. The selection of the model hub location and the hub activities must comply "Procedures to address environmental and social impacts" Chapter 6, ESMF for Mongolia Transport Connectivity and Logistics Improvement Project. In addition, the site selection of the model regional logistic hub should meet the following site selection criteria.

The site of the hub should be located:

- far from protected areas, areas of biodiversity value, water source protection zones, heritage sites and other areas of high value.
- at an area with convenient transportation and power supply from electric grid.
- in an area with stable geological conditions and far from areas with low resistance to natural disasters such as earthquakes, landslides and floods
- So that it does not negatively impact local conditions and amenity through traffic, operational noise or pollution
- Away from any social infrastructure such as schools, hospitals or medical clinics

4. Baseline information

Baseline environmental survey should be undertaken during the Environmental and Social Impact Assessment in order to understand the prevailing conditions and to predict the likely changes once the anticipated project is operationalized. During the baseline surveys, it should be determined the limits of the study area - defined to encompass all anticipated direct/indirect project impacts. Should be described and analyzed the physical, biological and human conditions, relevant environmental and social issues within the anticipated project area including any changes anticipated before project implementation. As well as, should be assessed the interrelations between the environmental and social components and the value that the local populations attach to these components to allow them capture the environmental and social dimensions representing particular interests. The assessment of flora and fauna should be all inclusive in the area but particular attention was given to rare, threatened, sensitive or vulnerable habitats such as protected or conservation areas near the anticipated project site.

Due to limited information of the model regional logistic hub and COVID-19 restrictions, high level baseline information will be provided in the preliminary ESIA.

4.1 Environmental and ecological baseline

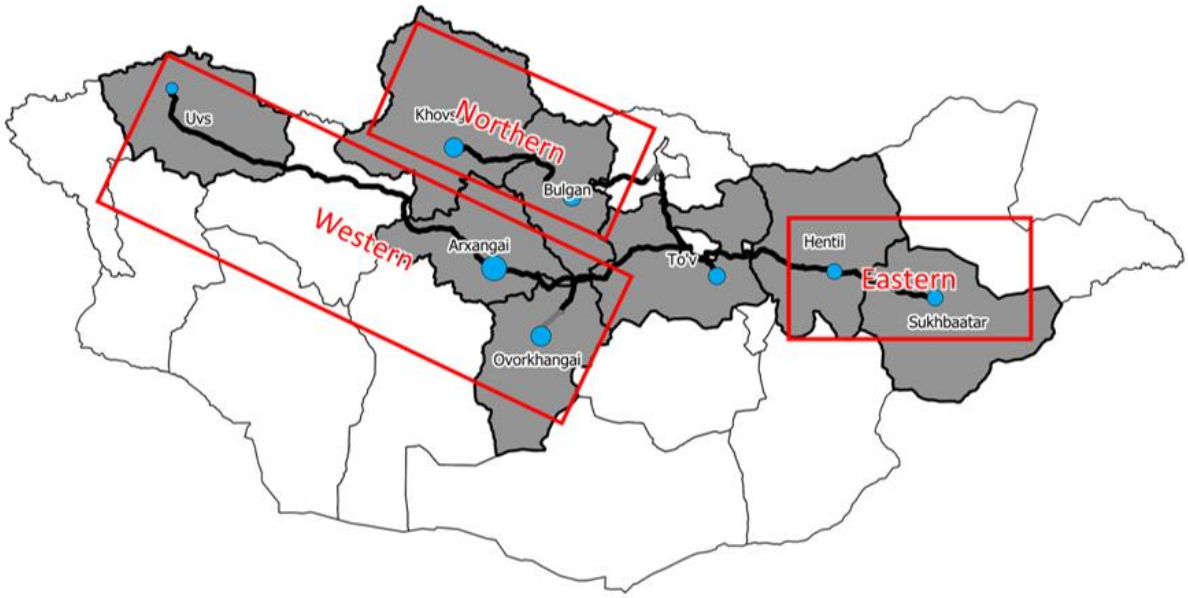
4.1.1 Project Location "Ovorkhangai province"

Mongolia is a landlocked country located in Northeast Central Asia, between China and Russia. It is situated at a high elevation, on average 1580 m above sea level and forms the transition zone between the great Siberian taiga and the Central Asian desert.

The geological history of Mongolia is characterized by periods of mountain folding and volcanism and subsequent periods of uplifting and subsidence. In the beginning the region was mountainous and rugged, with rivers flowing in all directions to the surrounding seas. After a very long period of erosion, the ancient continent was worn down almost to base-level, and since that time mountain-folding has not occurred. Therefore, several internally draining inland basins developed in the Gobi area.

Ever since the Lower Cretaceous, when these changes took place, the region has been continental in nature. Flat undulating steppe land with extensive grasslands forms the eastern part of the country. The central and western parts are characterized by the mountain ranges of Khentii, Khangai and Altai. The highest point in Mongolia is Khuiten Mountain at 4374 m above sea level in the Altai Mountains; the lowest point is Khokh Nuur valley at an elevation of 532 m in the north-east(Management, 2013).

Ovorkhangai aimag is located in the central part of Mongolia. The Khangai mountain stretches in the North-West, and the Altai mountain towers in the south-west. The steppe lies in the middle of the territory. The Gobi desert is located in the South. The annual average temperature is around 34° F (1° C), and the average precipitation is about 5 inches (135 mm.). The soil in the south of the area is semi-desert grey and steppe pale areas, in the north part of the area it is mountain type brown and black. 2 percent of the area is covered with poplar, birch, pine, larch forests. There are beautiful oasises with shrubs, cargana, haloxyan, and almond growing everywhere.



The total territory of Ovorkhangai aimag is 63500 km2, 385 km from north to south, 310 km from east to west. It is located 430 km from Ulaanbaatar city. It is located 1,813 meters above sea level.

4.1.2 Physical environment-topography, geology, and soils

Ovorkhangai aimag is located in the central part of Mongolia. The Khangai mountain stretches in the North-West covering 23 percent of the aimag's territory, and the Altai mountain towers in the south-west. The steppe lies in the middle of the territory covering 28.2 percent of the territory. The Gobi desert is located in the South covering 48.8 percent of the total territory.

4.1.3 Climatic conditions

Climate: Ovorkhangai aimag's average air temperature of January is -18.1°C and at the coldest it reaches -44°C. For 36 days in winter the temperature drops down to -30°C or below. The cold weather continues for about 180 days of the year. The remaining half of the year is warm, therefore, the annual average temperature is 0°C. The average annual precipitation is 354.5mm in Ovorkhangai aimag. It is common to have heavy rainfalls and sometimes the precipitation reaches 46mm a day. The most of the annual precipitation of Ovorkhangai aimag falls during the 3 summer months. The average wind speed is 4.2-5.2m/sec throughout the year. Spring and fall are the windiest months and the continuation of the heavy winds is comparatively longer than in the other seasons in Ovorkhangai aimag

4.1.4 Biological environment

Ovorkhangai aimag's vegetation is dominated by steppe community plants such as Stipa baicalienesis, Stipa krilo, Leymus chinensis, Bupleurum scopzonerifolium, Galium Verum and Astragalus melilotoides. It is home to endangered animals of forest, taiga and Gobi regions such as deer, antelope, steppe fox, wolve, wildcat, wild ass, lynx and leopard, wild sheep, Ibex wild goat, white antelope, black tailed gazelle and snowcock.

4.1.5 Water resources

Mongolia lies in arid and semi-arid climate zones. Nevertheless, the volume of renewable water available per capita exceeds 10,000 m3/year, which is more than in most other countries in the world. This seeming contradiction can be explained by the country's population density of only 1.77/km2, which is the lowest in the world. Obviously, this is also the essence of water management in Mongolia: the country does have a lacks fresh water resources, but these are thinly distributed and dispersed across a vast area. The water management challenge is to make this thinly distributed resource available at the locations where the needs are. Mongolia intends to develop this resource to benefit its population, while minimizing the adverse impacts this may have on the natural environment and ecology.

Surface water resources

The surface water resources of Mongolia comprise rivers, lakes, springs and glaciers. The total volume of fresh surface water is estimated at about 535 km3. Additional 90 km^3 surface water is stored in saline and brackish lakes.

The surface water resources are unevenly distributed over the country. In the northern and central part of the country the river network is much denser than in the rest of the country. About seventy percent of all the surface water resources is formed in the mountain ranges, which occupy only thirty percent of the country

The surface water resources of Mongolia are monitored by IMHE with a hydrological gauging network of 126 permanent gauging stations at 110 rivers and 16 lakes. The longest records go back to 1942. Groundwater monitoring is conducted by various organizations at an increasing number of sites. Only a few of these sites have records longer than ten years.

Water quality

The water quality of the surface water in 72 rivers and 9 lakes is monitored at approximately 140 monitoring sites by IMHE. The parameters observed are major cations and anions, total dissolved solids (TDS), pH, O2, BOD and some trace metals. Surface water quality samples are taken at 140 sites by IMHE. Benthos and plankton are sampled by IMHE at 64 sites. Mongolia is a large country with a huge variation in climatic and geographic conditions. Therefore, an accurate assessment of the water resources on the national scale is difficult.

The TDS of the river water ranges between 300-500 mg/l, while the concentrations of the various anions and cations are highly variable and depend on local geological, climatic, and geographical conditions. Ca2+ and HCO3 - are the dominant ions. Ammonium concentrations range from a minimum of 0.1 to more than 1 mg/l but concentrations higher than 0.5 mg/l are very rare. The average concentration of phosphorus (PO4-P) is 0.025 mg/l, which reflects the condition of unpolluted rivers.

The TDS in the fresh water lakes ranges from 50-300 mg/l, but is much higher in the brackish water lakes (2,000-15,000 mg/l).(Management, 2013)

Water pollution

Most of the river water is suitable for any use. However, locally, the river water becomes more and more affected by mining and other human influences. The sediment and nutrient (nitrates, phosphates) load of

rivers also increases due to ongoing deforestation and trampling of river banks by livestock. This diffuse pollution occurs especially in areas with high concentration of people and animals.

Eutrophication

Although in general eutrophication is not a major issue yet, in some parts of Mongolia like Ugii Lake it has become a major problem. Lake water gets green in mid July every year and domestic animals are reported to have died after drinking water from the lake. Preliminary data from a biodiversity survey of Western Mongolian lakes indicate that eutrophication is becoming more common.

Ecology

The surface waters of Mongolia form an important water habitat in an often-dry environment. Apart from the livestock herders also typical flora and fauna species depend on the favorable wet conditions. The lakes and wetlands in Mongolia are an important breeding ground for seasonal birds. Some of these birds, like the Dalmatian Pelican, are rare and endangered.

The rivers and lakes of Mongolia are abundant with fish but contain a limited number of fish species of which many are endemic to the country. They therefore have a high ecological value, such as the Taimen. In recent years the number of fishes is declining rapidly due to overfishing (both commercial and touristic) and locally due to pollution.

Ground water resources

Groundwater is the main water source in Mongolia for drinking water and industrial water. It may be estimated that 99% of the population uses groundwater for drinking water. Livestock watering uses groundwater from wells in areas away from rivers.

Irrigation schemes in majority use surface water but the use of groundwater is increasing. Also the majority of the mines and industries extract groundwater. Mines also pump groundwater to dewater the mine pit. Industries in urban areas either use water from the central system or from own wells.

Currently groundwater monitoring is conducted by MEGD, IMHE, GEI, MUST, water supply and private mining companies at an increasing number of sites. The length of the available observation records is generally too short to allow using this data at this moment for groundwater resources estimation.

In 1958, groundwater resources were estimated for the first time in Mongolia. Since then several attempts were made to derive a more accurate estimate. In 1971-1975, the “General scheme of integrated use and protection of water resources of the People’s Republic of Mongolia” estimated the total groundwater resources at 12.1 km3/year and the available groundwater resources at 6.1 km3/year. Estimates of the exploitable groundwater resources were mainly based on the indirect evidence of the recharge to the groundwater and from the knowledge on the extent of the aquifers.

River Basin Management in Ovorkhangai province

Ovorkhangai consists of 6 river basins including, Tuul, Orkhon, Ongi, Taats, Umard Goviin Guveet-Khalkhiin Dundad tal and Altainuvur Govi.

Name	Area	Basin	Type	Surface water resources (million m3/year)			Groundwater reources (million m3 year)	
				Total resources	Environmental	Possible use	Potential exploitable	Exploitable resources
Tuul	50,074	A	SW	1,073	1,010	63.1	637.7	142.8
Orkhon	53,455	A	SW	2,345	2,123	221.6	838.3	26.7
Ongi	39,724	CA	SW/GW	26	25	1.0	294	5.8
Taats	25,425	CA	SW/GW	22	21	0.9	61	0.5
Umard Goviin Guveet - Khalkhiin Dundad Tal	180,555	CA	GW	0	0	0	433	46.7
Altain Uvur Govi	221,156	CA	GW	0	0	0	337	65.5

Explanation:

Basin: A = Arctic Basin, P = Pacific Basin, CA = Central Asian Internal Drainage Basin

Type: SW = Surface water, GW = Groundwater

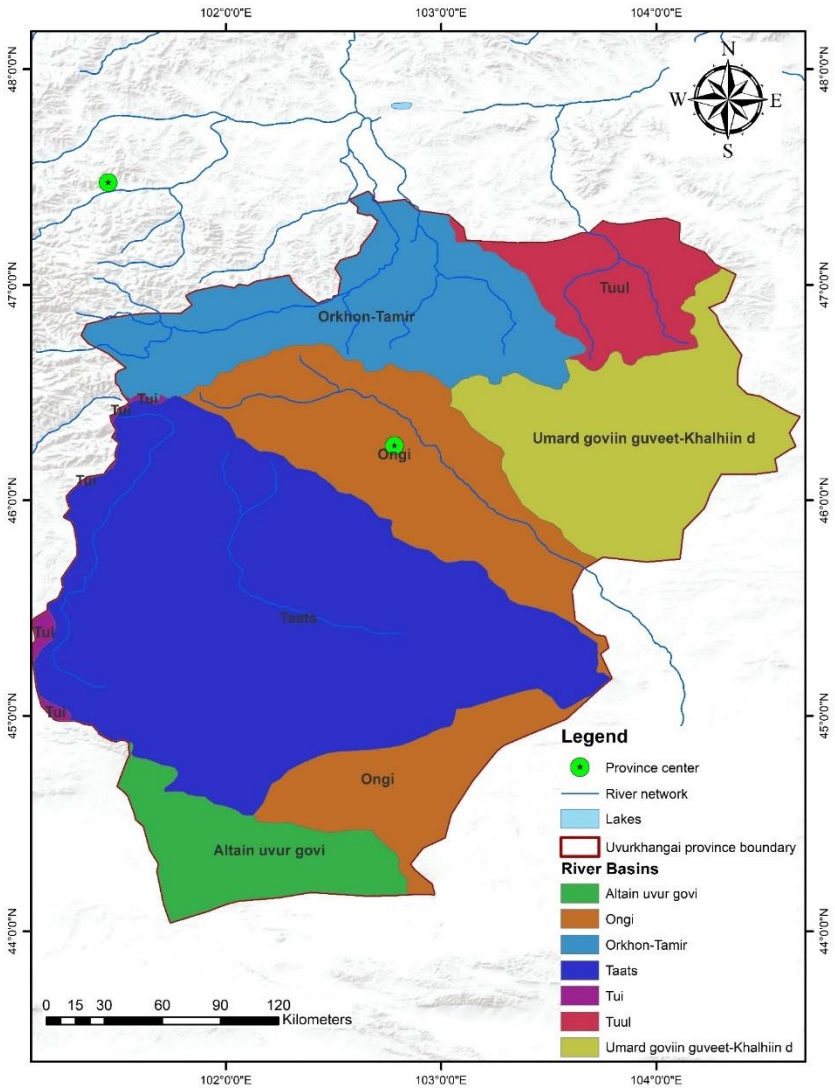
Surface water: Total resources based on surface water which is generated in an average year within the river basin only; inflow from other upstream river basins is not included.

Environmental flow: Davaa and Myagmarjav (1999) estimated the minimum flow requirement in Mongolian rivers. The environmental resources are based on their estimate.

Possible use: total resources – environmental resources

Groundwater: Potential resources based on aquifer properties and renewable resources.

Exploitable resources based on approved groundwater deposits

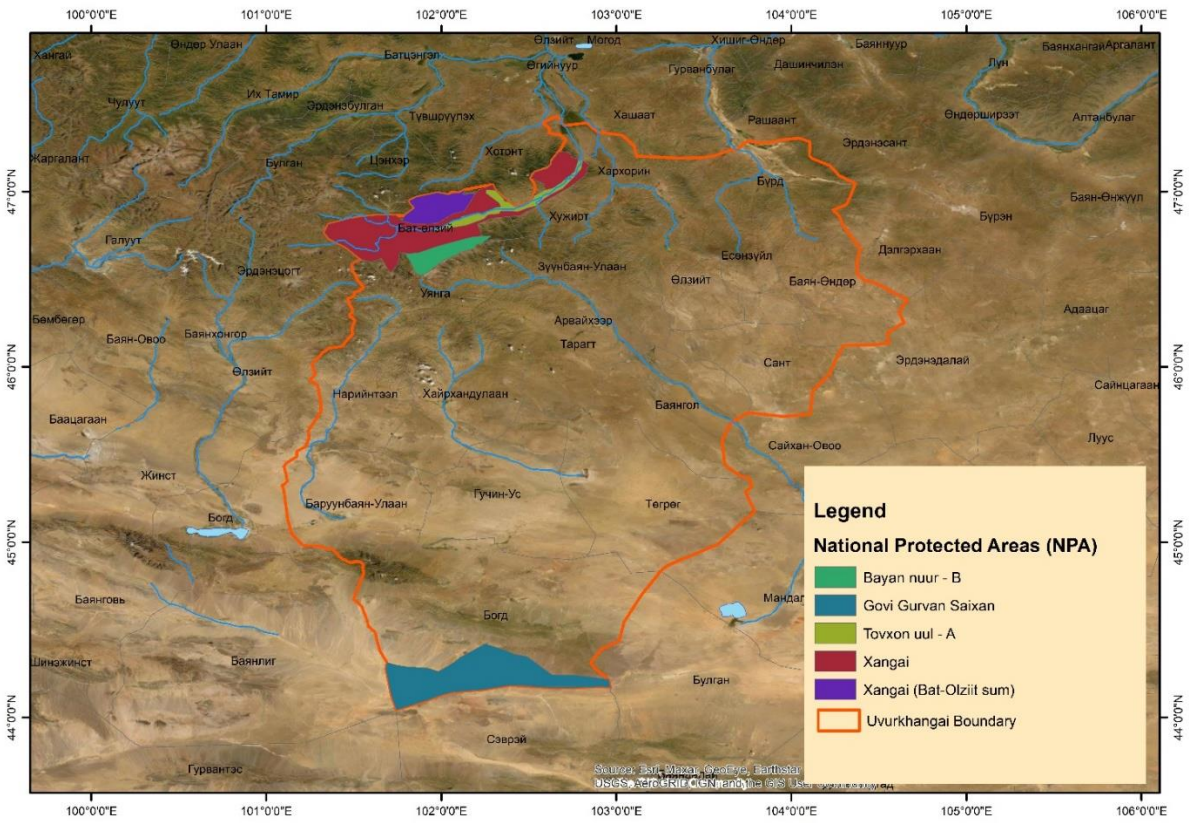


4.1.6 Sensitive areas

The protected areas network in Ovorkhangai

In northern and southern part of the Ovorkhangai province, National protected areas are located therefore its suggested to avoid for any activities for following areas (https://eic.mn/spa/gis.php)

The local protected areas are in the middle of the map (indicated orange and yellow).



National Protected Areas	Longitude	Latitude
Khangai Nuruu	101.6565	46.7173
Govi Gurvan Saikhan	102.2498	44.2531
Huisiin naiman nuur	101.8103	46.5589
Batkhaan uul	104.1833	47.1749

As defined in the UNESCO World Heritage list, Orkhon Valley Cultural Landscape encompasses an extensive area of pastureland on both banks of the Orkhon River and includes numerous archaeological remains dating back to the 6th century. (UNESCO, 2004). As a home for centuries to major political, trade, cultural and religious activities of successive nomadic empires, the Orkhon Valley had been serving as a crossroads of civilizations, linking East and West across the vast Eurasian landmass.

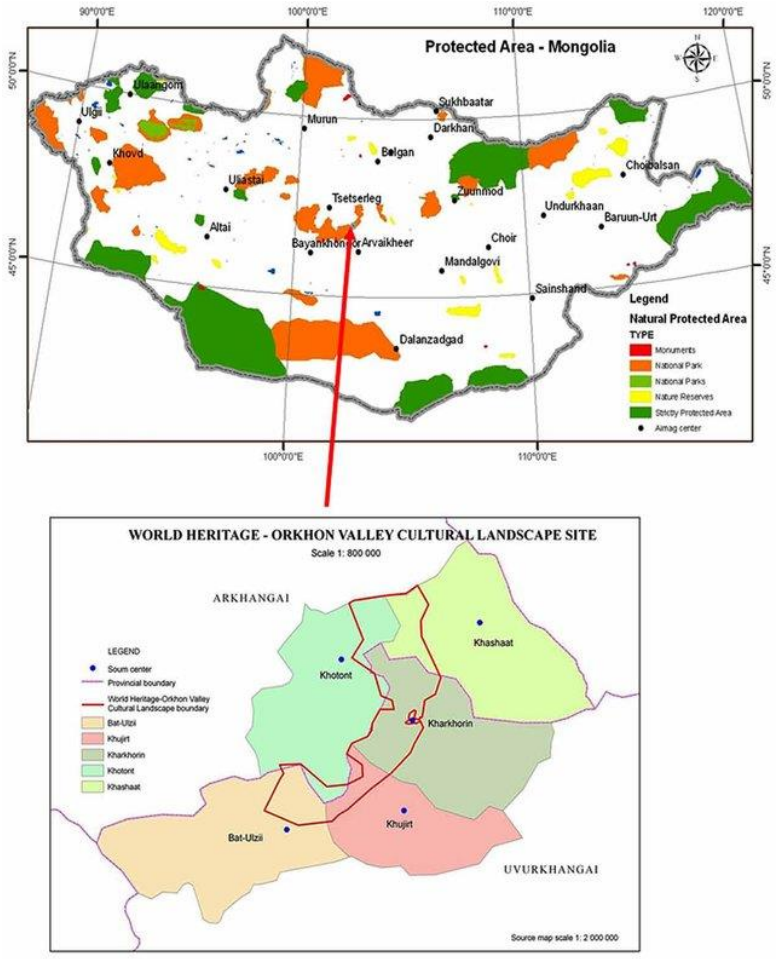


Figure X. Protected area network of Mongolia and Orkhon Valley National Park

4.2 Socio-economic baseline

4.2.1 Administrative and Political units

Mongolia has three levels of administration. The highest level is divided into 22 major administrative units including Ulaanbaatar (Capital of Mongolia) and 21 aimags (provinces). Ulaanbaatar city has nine duuregs (districts) and 121 khoroos (sub-districts). Aimags are subdivided into soums, which are subdivided into baghs. Mongolia has 329 soums and 1,599 baghs.

Ovorkhangai aimag was established in 1931. Ovorkhangai aimag located in the center of Mongolia and has 19 soums and 111 baghs. The most updated poverty rate data for Ovorkhangai is 34.1% in 2018.

Table 4 Soum names list

	Soum	Сум	Population
1	Arvaikheer	Арвайхээр	33342
2	Baruun Bayan-Ulaan	Баруунбаян-Улаан	2791
3	Bat-Ulzii	Бат-Өлзий	7632
4	Bayan-Undur	Баян-Өндөр	3667
5	Bayangol	Баянгол	3847

6	Bogd	Богд	5706
7	Burd	Бүрд	2915
8	Guchin-Us	Гучин-Ус	2223
9	Khairkhandulaan	Хайрхандулаан	3495
10	Kharkhorin	Хархорин	12498
11	Khujirt	Хужирт	6807
12	Nariinteel	Нарийнтээл	3589
13	Ulziit	Өлзийт	2401
14	Sant	Сант	3591
15	Taragt	Тарагт	3161
16	Togrog	Төгрөг	2727
17	Uyanga	Уянга	9545
18	Yesonzuil	Есөнзүйл	2919
19	Zuunbayan-Ulaan	Зүүнбаян-Улаан	3876
		Total	116732

4.2.2 Demography

Total population is 116732, 49.8% male, 50.2% female, and total of number of households is 33062 as of 2020. 99.6% is Khalkh, 0.04% Khazakh, 0.08% Durvud ethnicities are registered in 2020.

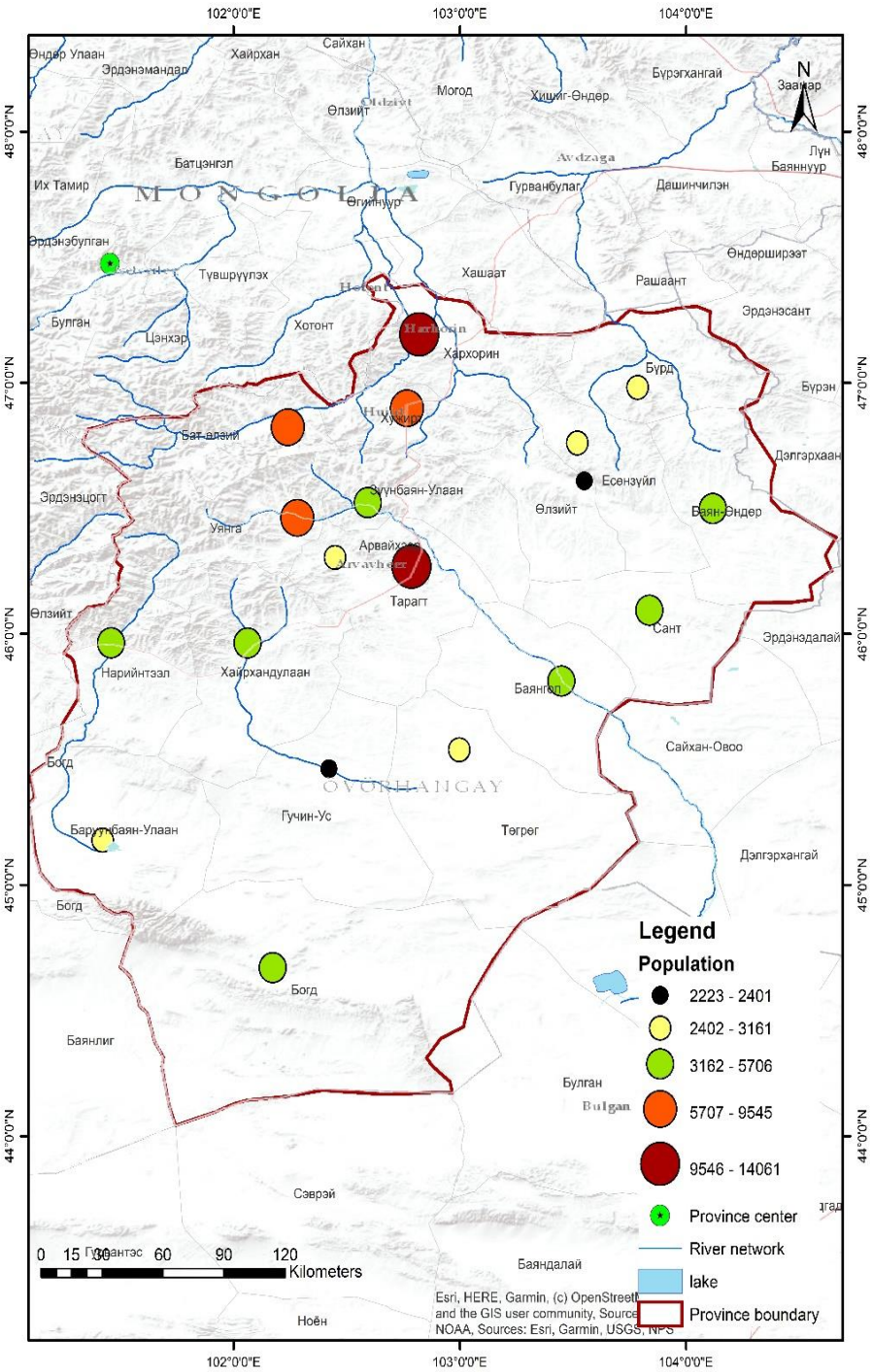


Figure 1 Population distribution map of Uvurkhangai province

4.2.3 Education and Literacy

Due to the low population density resulting from the vastness of the county and insecurity, schools tend to have few pupils per class which is a major contributor to the low teacher pupil ratio.

4.2.5 Energy resources

The main source of energy for domestic use by households in the county is firewood for cooking and kerosene or sun panel for lighting. Province and soum centers are connected with central electricity while rural area or herders in countryside have no connection. Lack of reliable electricity has is a major constraint in the growth of the centres. Continued use of firewood or coal poses both health and environmental concerns and has contributed to forest degradation, air quality and climate change problems. It is expected that energy for the hub would either be provided by the grid, or by a captive renewable energy power project (solar or wind).

4.2.6 Water resources

Hydrogeology: Orkhon, Tuul, Southgobi guveet, Central khalkh, Ongi, Taats, Altai southgobi six basins are in Ovorkhangai. Upon identification of exact location of the hub, further study shall be conducted on water supply source and its impacts.

Table 4 Orkhon River Basin area by percent in total soum area

Soum name	Area in Basin	Total soum area
Batulzii	99.7	0.1
Burd	0.9	0.1
Sensual	28.9	1
Zuunbayan-Ulaan	21.5	1
Ulziit	37.3	1.4
Uyanga	13.3	0.8
Kharkhorin	88.8	3.8
Khujirt	100	3.1

4.3 Economic setting

4.3.1 Land and land use

Agricultural land occupies 115.5 million ha or 73.9% of the country's land area. Pasture land accounts for more than 98% of the agricultural area. Traditionally the pastures are used for (semi-) nomadic livestock husbandry and hay making. Crop land occupies only 0.93 million ha (0.8%) of the agricultural land (Figure 7). About one third (some 14.3 million ha) of the remaining land is forested. These forests are mainly found in the mountainous area in the north.

Over a century (1918-2010) the area of pasture land decreased with about 15 million ha, while the livestock population increased with about 25 million head. This gradually increased the pressure on the grazing lands, because of the reduced area per head of livestock. In 1990, crop irrigation in Mongolia was well developed; the total area of irrigation schemes was 91.8 thousand ha, of which 90% was irrigated with surface water, the remainder with groundwater. In 1998 the area had decreased to about 5,000 ha.

Since 2003 the irrigated area gradually increased to 37.5 thousand ha in 2010 (about 10% of the actually cropped area).

4.3.2 Tourism

Cultural heritage: Historical and cultural monuments of the Orkhon Valley, the beautiful Red River tributary of the Orkhon River, the Eight Lakes of Khuisiin, and holy mountains of Baruun, Zuun Khairkhan, Dulguun, Batkhaan, Khankhugshin, Zuun Bogd Khanbayan, Khangai Ovoo, Avzaga and Khongor Khairkhan are worshipped in Ovorkhangai aimag.

The Kharkhorum, the central point of Mongolia has many ancient monuments, as it was once the former capital of Mongolian Empire. Shireet Tsagaan Lake is historical site where Undur Gegeen Zanabazar was throned, and Tuvkhon Monastery, Erdene Zuu buddhist temples are also located in Ovorkhangai since 16th century.

The Mongolian Horse Idol Complex, located in Bayan Tolgoi, west of the aimag center, is also a respected and worshipped site.

4.4 Infrastructure and access

4.4.1 Road transport

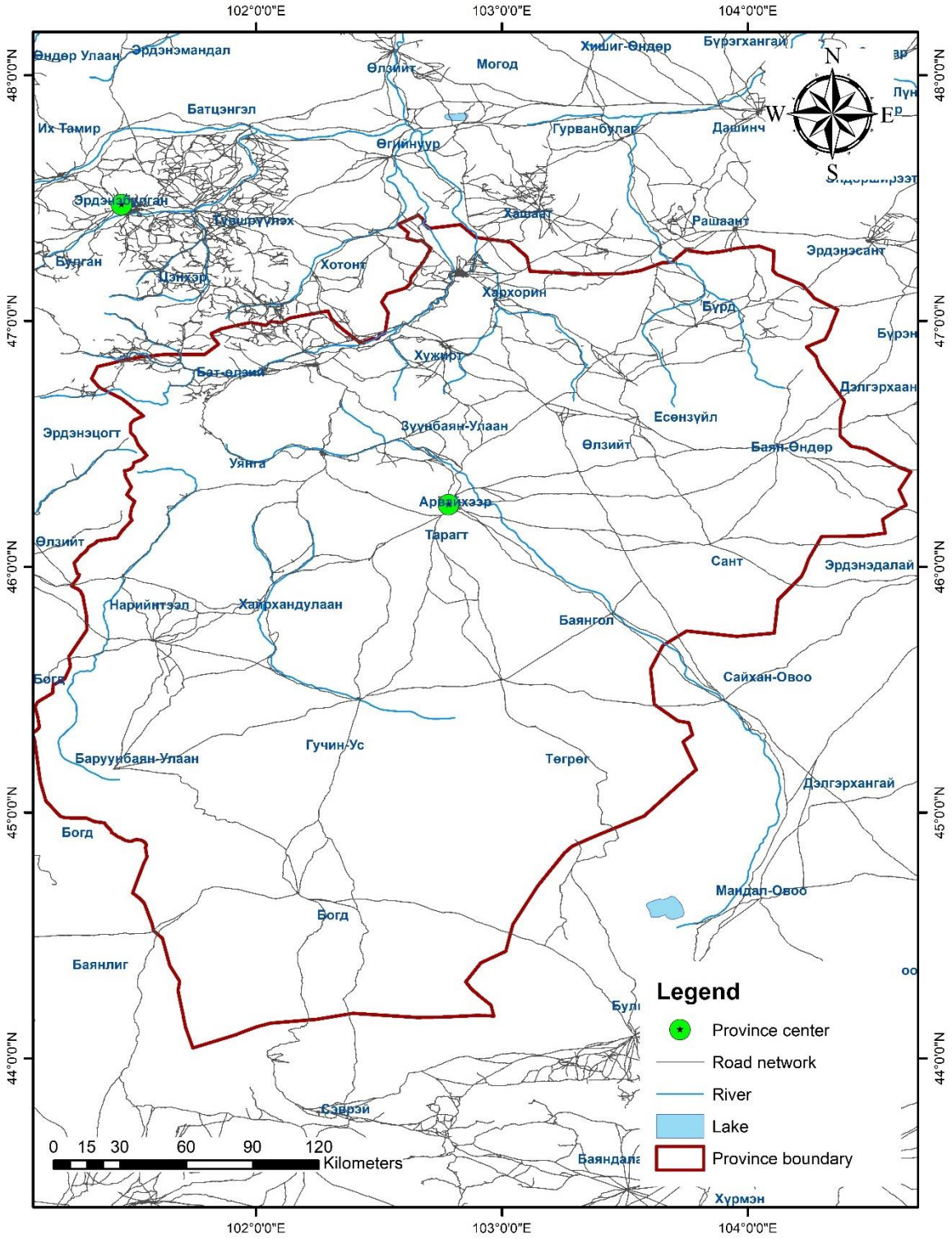


Figure 2 Road network map of Ovorkhangai province

5. Environmental and Social Risks and Impacts

Environmental and Social Risks and Impacts provides an analysis of the potential impacts likely to emerge from implementation of project activities. It addresses potential impacts associated with the proposed Model regional project and delivers measures for both mitigating (i.e. avoidance, reduction, or restoration of) negative impacts and enhancing (i.e. improving) the positive effects of the project. The major positive impacts of the proposed project were mainly the economic and social benefits that can be acquired at the county and national levels. On the other hand, the major adverse impacts arise from generation of solid wastes, wastewater and air pollutants. Cost-effective and environmentally sustainable techniques that can mitigate the adverse impacts and enhance the positive effects are proposed. Emphasis is given in selection of best available techniques (BAT) and practices for preventing and reducing discharge of processed wastes to the environment. Special consideration is also given to the sustainability of the proposed project through integration of best available pollution prevention technique e.g. reusing and recycling of process wastes and by-products without compromising the economic and social benefits of the project. Based on the standard requirements a suitable by-product rendering and wastewater treatment plants are proposed and a preliminary design data and operational requirements is given.

The following anticipated positive and negative environmental impacts of the Model Regional Logistics Hub are discussed based on the Mongolia Transport Connectivity and Logistics project's PAD, and the ESMF. Further comprehensive environmental and social assessment shall be conducted upon feasibility study and the selected hub location during the project implementation, and environmental baseline study will be conducted with site visits and field surveys by environmental experts and social experts, and consultations with local communities.

5.1 Steps of impact assessment

The potential impacts of the proposed project should be assessed using the following steps:

(i) characterization of the baseline conditions or rather the existing conditions before the project is undertaken and any effects are generated;
(ii) description of the project components in different project phases (pre-construction, construction, and operation);
(iii) identify sources of impacts and the impacts themselves that are generated by any aspect of the project;
(iv) identification of mitigation and enhancement measures to address the impact.

5.2 Anticipated Pre-Construction phase Impacts

Pre-construction phase negative impact are typically associated with site selection, hub activities design, permanent land acquisition and associated loss of land. The site shall be selected to be far from environmental sensitive receptors such as protected areas, ecological sensitive area, critical habitats, cultural heritage sites, etc. to avoid adverse impacts to these environmental sensitive areas. As all

activities will take place on government owned unoccupied land and there will be no land acquisition or associated impact, no mitigation measures are required.

5.3 Anticipated Construction Phase Impacts and Mitigation Measures

Positive Impacts

Positive Impacts During the construction period, there is a likelihood of having the following impacts:

Creation of employment opportunities

Increased job opportunities will be available for construction workers during the construction phase of the project. Employment opportunities are a benefit both in economic and social sense. For the construction development non-skilled labor, from the local community, will be hired.

Increased business opportunities with construction workers

The construction workers required will provide ready market for various goods and services, leading to several business opportunities for small-scale traders such as shop owners, accommodation providers, and food vendors near the project site.

Provision of market for supply of development materials

The project will require supply of large quantities of project materials some, of which will be sourced locally in the surrounding areas. For instance, the project shall provide ready market for construction material suppliers such as quarrying companies, hardware shops and individuals with such materials.

Increased revenue to suppliers of construction materials and utilities This will be an opportunity for the suppliers of construction materials and other utility suppliers to create market and sell their goods. In turn this will boost their profit margin which is an advantage to their businesses. Other small businesses will also be pulled by the construction activities such as small eating cafes.

Negative Impacts

The construction phase of the project involves clearing, land levelling, transportation of construction materials, erection of machineries, and installation of utility systems etc. Potential adverse impacts associated with the construction activities of the project are:

Air pollution prevention

The anticipated impacts on ambient air quality during the construction of the Model regional hub are expected to be minor and short-term. While constructing road and building, dusts from earthwork at the project site, movements of vehicles, loading/unloading which can exceed the permissible maximum value for air quality for international and national standards which can negatively impact on population health, soil and vegetation cover. Exhaust gas and smoke from vehicles, techniques and machineries have would negatively impact on air and soil pollutions.

Operation of construction equipment results in crankcase emissions, exhaust and fugitive dust being released. Construction equipment to be utilized by the project will also produce emissions of nitrogen oxides (NOx), hydrocarbons, and suspended particulates along with limited quantities of sulphur dioxide (SO2), which will result from the use of diesel fuel. However, the contribution of their impacts on the air quality degradation is expected to be localized and insignificant.

Noise and vibrations

Construction of the Model regional hub may cause temporary and localized increases in background ambient sound of different strengths with specific impact dependent on the method of construction and equipment used. The principal noise sources associated with the proposed Model regional hub construction activities include heavy equipment such as bulldozers, scrapers, and trucks which will only have a temporary impact for the duration of the construction.

Soil degradation prevention

Removal of soil cover and excavation works associated with this project may lead to increased soil erosion at the project site and release of sediments into the drainage systems, especially if construction works are done during the rainy seasons. During the construction work, topsoil will be depredated and dust amount will be increased. As well as the waste from the production process should be processed in proper way otherwise it will affect directly and indirectly on human and livestock's health.

Soil erosion may also pollute local streams/rivers from contaminants carried with or attached to soil particles and it may also negatively affect the soil fertility of the affected land. Appropriate and timely control measures will arrest and minimize soil loss and siltation as well as the sedimentation along the gentle slope and water courses.

Impacts on water quality and demand

Excavation and earth movement during construction and operation can cause pollution of surface and groundwater quality and alter hydrological conditions. The main source of pollution from these activities is increased surface runoff and soil erosion from exposed ground causing high turbidity (suspended solids) and sedimentation in water bodies. In addition to this, during the construction phase of the project foreign materials like oil, grease, fuel and residues of derbies can originate, which are potential threats for water quality degradation. Due to the construction phase, water environment can be contaminated by waste water from the construction process and used materials. According to the Long Name Law, any activities should be avoided for 50-200 meters from the water sources and forest areas. The law dedicated to protect the water sources and land to be polluted and contaminated.

Occupational health and safety

Potential impacts during construction include: exposure to physical hazards from the use of equipment; trips and fall hazards; rock falls/slides in steep areas and exposure to dust and noise.

Solid wastes

Solid waste will be generated at the site during construction of the Model regional hub and related infrastructure. The sources of this waste will be rejected materials, surplus materials, surplus spoil, excavated materials and deleterious material. Deleterious material may originate from aggregate screening, maintenance and, repair of machinery at the contractor's camp, workers domestic related waste as well as waste water, paper bags, and empty cartons. At the end of the construction stage waste will be generated due to the demobilization of contractor's camps. The expected wastes from such demolitions shall include: rejected materials, paper bags, and empty cartons, among others.

Liquid wastes

Different liquid wastes are expected during the construction phase. Among the key liquid wastes include machinery oils, paints, waste oil, bitumen and wastewater from sanitation, among others. Poor maintenance and operation of heavy trucks and equipment might lead to oil and fuel spills at the construction site which may contaminate land and water resources in the area. Release of hydrocarbons to the environment has several impacts including sub-soil and groundwater contamination; air pollution, fire and effects on human health due to dermal contact, inhalation or ingestion.

Influx of labor

During construction of the proposed logistics hub, there is potentially influx of labor which is likely to cause impact to local communities such as safety issue caused by labors from outside, price inflation of goods for daily consumption, etc.

Contractors will be requested to prepare labor management procedure which should lay out proper training to their workers on code of conducts. This will be included in the procurement plan and reflected in the bidding documents.

Health and safety of local communities

Construction activities will potentially cause negative impacts such as traffic safety, noise, dust etc.

Proper mitigation measures will be requested from contractors and included in their bidding documents.

5.4 Anticipated Operational Phase Impacts and Mitigation Measures

Positive impacts

During the operation phase the following positive impacts are foreseen:

Additional knowledge and skills in meat packaging/logistics sector

Since the project is a technology intensive enterprise, which involves many industrial technologies, it is also believed that its implementation will add additional knowledge to the local industries and at the same time create the opportunity and exposure to the local experts on the sector. Executing the proposed project in a manner that benefits the Ovorkhangai province at large (example: production of quality products, introduction of technologies that maximize the product yield at the same time reducing the environmental burden of the production process) is proposed as a benefit enhancement measure.

Attraction of new investors to Ovorkhangai province

The improvement in quality meat processing at the proposed Model regional will be a flashpoint translating to economic growth in the County and leading to attraction of more investors in the livestock value chain, and other associated sectors.

Direct and indirect employment opportunities

The project would be able to employ several staffs from the locality during the operation phase thereby contributing to the social and economic wellbeing of the community. For instance, the project is expected to create direct job opportunities who will be from the local people residing near by the project area.

Improved efficiency in meat processing

The opening of the Model regional hub will improve efficiency in quality and hygienically packaged meat products to be supplied to both the local, national and international markets.

Improved livestock trade

The trade in livestock in Ovorkhangai province is expected to increase and improve in more positive manner. Livestock producers will have ready market for their livestock.

Increased compliance ability to public health guidelines

Increased abilities of butchers to comply with public health and hygiene regulations resulting in the reduction of public disease levels and the income generation through sales of byproducts processed in rendering plant are some of the economic benefits to be realized at a regional level.

Professional capacity enhancement

Participating local professionals at different stages of the project will enhance capacity building in the livestock production and marketing sector. This is also an opportunity to minimize operating costs and professionals can be readily available locally for maintenance and expansion activities.

Revenue to county government

Through payment of relevant taxes, rates and fees to the County Government, the project will contribute towards the County Government revenue earnings from those using the improved facilities, and any increase from economic activities brought about by the improved station.

Negative impacts

Increased pressure on climate change

The operation of the model regional logistic hub, especially the cold-storage warehouses, will increase energy demand in the Ovorkhangai aimag. Ovorkhangai aimag is part of the Central Energy System of Mongolia, where majority of the primary energy source is coal based. Hence, the establishment of model regional hub will increase GHG emission.

Wastewater effluents

The consumption of water by users in the Model regional hub leads to a corresponding increase in the amount of water discharged from the facilities. Unless an appropriate treatment work is put in place, the wastewater to be discharged from the facilities its operational phase would have polluting effect on the nearby seasonal water course and the rich underground water and degrade the soil. Discharge of untreated wastewater from any stage.

Solid wastes

The potential solid waste could include the vehicle repair wastes, wasted packages and waste domestic garbage. The expected solid waste will be further estimated upon detailed design of the processing production is available.

Air emissions

The potential air emission may include exhaust from transport trucks and other air emissions, which will be further assessed when the detailed design of the model regional logistic hub is ready, especially the energy source of the hub.

Noise

The ambient noise levels are likely to increase because of this project with an accumulation of noise level sources processing equipment, and heavy vehicle movements. Transport to and from the Model regional hub as well as loading and unloading may cause noise disturbances. Fans, refrigeration equipment and similar machines may also cause this kind of disturbance. The main generators of noise during the operation of the project include: plant noise, unloading area noise, traffic noise, packaging operation noise and human activities.

Increased pressure on energy resources

The operation of the proposed project requires a considerable electrical energy resource for: running of machines (especially the machines for cold storage), power for the facility, buildings, etc. To mitigate the increased pressure on energy, some of the potential alternative energy sources for the proposed Model regional hub will be considered during the feasibly study for the hub, which may include solar heating and solar lighting.

Socio-economics, community health and amenity impacts

Apart from many beneficial aspects, the main problems associated with warehouses are as follows:

(a) Local nuisances such as potential odours from poorly maintained warehouse operations;

(b) Health risks – poor hygiene practices at operational and waste management level;

(c) Potential negative impact to nearby communities from truck drivers and workers at the logistics hub, such as GBV and SEA/SH related risks; and

(d) Land use conflicts.

Upon selection of the project site, further assessment shall be conducted.

Occupational health and safety hazards

Occupational Health and Safety are likely during the operation phase of the project. Some of these hazards could be risks of accidents and injuries for staff and fire risks.

5.6 Public participation

Introduction

Stakeholder engagement refers to an organization's efforts to understand and involve stakeholders and their concerns in its activities and decision-making processes. Stakeholders are defined as any group or individuals who (a) are affected, or likely to be affected by the project (project-affected parties); and (b) may have an interest in the project (other interested parties), including local communities, authorities, nongovernmental organizations, employees, customers and others. The overall purpose of stakeholder engagement in this project is to drive strategic direction and operational excellence for the proponent. Done correctly, engaging stakeholders can result in learning, innovation, and enhanced performance

that will not only benefit the proponent, but also its stakeholders and society. In addition to serving as a key tool to support a facility's sustainability reporting efforts, stakeholder engagement is a foundation that supports a facility's broader sustainability efforts to set strategic goals, implement action plans, and assess its performance over time. Public participation is essentially concerned with involving, informing and consulting the public in planning, management and other decision-making activities. Public participation tries to ensure that due consideration is given to public values, concerns and preferences when decisions are made. It encompasses the public actively sharing in the decisions that government and other agencies make in their search for solutions to issues of public interest. The main objectives of the consultation were to:

(i) Inform the public and key stakeholders about the proposed project and activities that will be undertaken;
(ii) Seek views, concerns and opinions of people in the area concerning the project;
(iii) Incorporate the views, concerns and proposals of community members, and other stakeholders on their expectations from the project activities;
(iv) Establish if the local people foresee any positive or negative environmental impacts from the project and if so, how they would wish the perceived impacts to be addressed; and
(v) Obtain socioeconomic information about the project area.

Methodology

Public participation shall be achieved through direct interviews, observations and questionnaire administration shall be conducted at the anticipated project area. The tool should be used to collect information is the administration of open-ended questionnaires where the respondent is free to comment on issues at own thinking.

After individuals complete the questionnaires individually and the expert finds some divergent and conflicting responses, usually Focus Group Discussions are held only on the conflicting ideas for the respondents to discuss the contentious issues and come to an agreement by themselves after informing each other. Stakeholders should be identified and Key Informant interviews should be carried out. A public consultation meeting should be held at the proposed site to find out the community concerns regarding the proposed project. Minutes of stakeholder meetings should be provided in Annex X of this report. Questionnaires should be then administered.

For this project, interviews should be conducted individually on a pre-set open-ended questionnaire to collect the views of various stakeholders. Respondents should be selected among key organization and government departments as well as community members. All the stakeholders should be accepted to respond. The following is a detailed discussion of public consultation methodology used by the ESIA team:

Key Informant interviews

Key Informant interviews shall be used to get responses from key stakeholders in the project area. Their comments should be sought through engaging them in discussions about the proposed project and associated activities.

Questionnaire administration

Questionnaires shall be uniformly distributed to the sampled residents. The community should be informed of the proposed project and shall be requested for their views concerning the project. Their views in terms of the anticipated positive and negative impacts and mitigation measures shall be captured using questionnaires (should be attached to the report). Details of participants and their inputs should be shown in Annex X.

Anticipated issues and concern raised

Table X summarizes the expectations, concerns and the mitigation measures that should be discussed during the key informant interviews, stakeholders" consultations and public meetings. Minutes of the public discussion forums shall be provided in Annex X.

Stakeholders	Expectations (Positive Impacts)	Concerns (Adverse Impacts)	Proposed Mitigation Measures and Recommendations by the Stakeholders

6. Mitigation Measures

Mitigation measures should be developed to mitigate the negative environmental and social impacts based on the national laws/regulations, technical guidelines and construction norms, and World Bank EHS Guidelines. Following mitigation measures are proposed based on the anticipated impacts identified during this preliminary ESIA stage and they will be further updated during the comprehensive ESIA stage.

6.1. Mitigation measures in pre-Construction phase

To mitigate the negative environmental impacts from the model regional logistic hub during the pre-construction phase, the selection of the model hub location and the hub activities must comply "Procedures to address environmental and social impacts" Chapter 6, ESMF for Mongolia Transport Connectivity and Logistics Improvement Project and the hub location shall be selected by adopting the site selection criteria indicated in the section 3.2 of this preliminary ESIA to ensure the model regional logistic hub site far from environmental sensitive receptors such as protected areas, ecological sensitive area, critical habitats, cultural heritage sites, etc.

Once the location of the hub and the detailed design of the hub are available, a comprehensive ESIA shall be conducted and an integrated ESMP should be prepared in accordance with Mongolian regulations, technical guidelines, World Bank ESF, and World Bank EHS Guidelines. The assessment result and proposed mitigation measures should be integrated into the detailed design. The ESIA requirements should be embedded in the bidding document and contracts of the contractors.

6.2. Mitigation measures in Construction phase

The environmental impacts during the hub construction will include fugitive dust, noise, spoil and construction waste, soil erosion and runoff, OHS impacts to workers and communities, traffic and road safety, which is expected to be temporary, site specific and easily managed by adopting mitigation hierarchy. The mitigation measures in Appendix 1 Environmental Management of Construction Activities should be followed during the construction phase of the model regional logistic hub.

6.3. Mitigation measures in Operation phase

Increased pressure on energy consumption and climate change

To mitigate the increased pressure on energy demand and the GHG emission,

- Energy efficiency technology shall be adopted in the design of the hub activities, such as minimize heat gains to the cooled space by use of air curtains, entrance vestibules, or rapidly opening/closing doors. Where conveyors carry products into chilled areas, minimize the area of transfer openings, for example, by using strip curtains;
- Some of the potential alternative energy sources for the proposed Model regional logistic hub will be considered, which may include solar heating and solar lighting.

Wastewater effluents

The anticipated wastewater generated during the operation of the model regional logistic hub are mainly domestic wastewater. The wastewater from the operation of the hub should be treated appropriately to meet EHSG requirements and local regulatory requirements before discharge. Following requirements shall be adopted for the wastewater management.

- Segregation of wastewater streams to ensure compatibility with selected treatment option (e.g. septic system which can only accept domestic sewage);
- Segregation and pretreatment of oil and grease containing effluents (e.g. use of a grease trap) prior to discharge into sewer systems;
- If sewage from the industrial facility is to be discharged to surface water, treatment to meet international standards for sanitary wastewater discharges;
- If sewage from the industrial facility is to be discharged to either a septic system, or where land is used as part of the treatment system, treatment to meet applicable national or local standards for sanitary wastewater discharges is required.
- Sludge from sanitary wastewater treatment systems should be disposed in compliance with local regulatory requirements, in the absence of which disposal has to be consistent with protection of public health and safety, and conservation and long term sustainability of water and land resources.

The streams, volume and treatment of the wastewater will be further assessed during the comprehensive ESIA. Detailed mitigation measures will be proposed during the comprehensive ESIA.

Solid wastes

The potential solid waste could include the vehicle repair wastes, packages and waste domestic garbage. Following requirements shall be adopted for the solid waste management.

- Identify and maximize the opportunities for source reduction, as well as reuse and recycling;
- Waste segregation should be applied to temporary storage of the solid waste;
- The solid waste will be collected and disposed by the licensed vendors as per local regulatory requirement.

The expected solid waste will be further estimated upon detailed design of the hub is available. And detailed mitigation measures will be proposed during the comprehensive ESIA.

Air emissions

The potential air emission may include exhaust from transport trucks and other air emissions, which will be further assessed when the detailed design of the model regional logistic hub is ready. And detailed mitigation measures will be proposed during the comprehensive ESIA.

Noise

Noise prevention and mitigation measures should be applied to mitigate the nuisance to sensitive receptors. Noise reduction options that should be considered include:

- Selecting equipment with lower sound power levels
- Installing silencers for fans
- Installing suitable mufflers on engine exhausts and compressor components

- Installing acoustic enclosures for equipment casing radiating noise
- Improving the acoustic performance of constructed buildings, apply sound insulation
- Installing acoustic barriers without gaps and with a continuous minimum surface density of 10 kg/m2 in order to minimize the transmission of sound through the barrier. Barriers should be located as close to the source or to the receptor location to be effective
- Installing vibration isolation for mechanical equipment
- Limiting the hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas
- Re-locating noise sources to less sensitive areas to take advantage of distance and shielding
- Siting permanent facilities away from community areas if possible
- Taking advantage of the natural topography as a noise buffer during facility design
- Reducing project traffic routing through community areas wherever possible
- Developing a mechanism to record and respond to complaints.

The noise source and potential impact will be further assessed during the comprehensive ESIA and mitigation measures will be updated accordingly.

Occupational health and safety hazards

Occupational health and safety hazards will be further identified and analyzed during the comprehensive ESIA stage. Following requirements shall be adopted to mitigate Occupational Health and Safety risks.

Preventive and protective measures should be introduced according to the following order of priority:

- Eliminating the hazard by removing the activity from the work process. Examples include substitution with less hazardous chemicals, using different manufacturing processes, etc;
- Controlling the hazard at its source through use of engineering controls. Examples include local exhaust
- ventilation, isolation rooms, machine guarding, acoustic insulating, etc;
- Minimizing the hazard through design of safe work systems and administrative or institutional control measures. Examples include job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc.
- Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE.

Fire Precautions

The workplace should be designed to prevent the start of fires through the implementation of fire codes applicable to industrial settings. Other essential measures include: ·

- Equipping facilities with fire detectors, alarm systems, and fire-fighting equipment. The equipment should be maintained in good working order and be readily accessible. It should be adequate for the dimensions and use of the premises, equipment installed, physical and chemical properties of substances present, and the maximum number of people present. ·
- Provision of manual firefighting equipment that is easily accessible and simple to use ·
- Fire and emergency alarm systems that are both audible and visible

Lavatories and Showers ·

- Adequate lavatory facilities (toilets and washing areas) should be provided for the number of people expected to work in the facility and allowances made for segregated facilities, or for indicating whether the toilet facility is "In Use" or "Vacant". Toilet facilities should also be provided with adequate supplies of hot and cold running water, soap, and hand drying devices. ·
- Where workers may be exposed to substances poisonous by ingestion and skin contamination may occur, facilities for showering and changing into and out of street and work clothes should be provided.

Lighting ·

- Workplaces should, to the degree feasible, receive natural light and be supplemented with sufficient artificial illumination to promote workers' safety and health, and enable safe equipment operation. Supplemental 'task lighting' may be required where specific visual acuity requirements should be met. ·
- Emergency lighting of adequate intensity should be installed and automatically activated upon failure of the principal artificial light source to ensure safe shut-down, evacuation, etc.

Safe Access ·

- Passageways for pedestrians and vehicles within and outside buildings should be segregated and provide for easy, safe, and appropriate access ·
- Equipment and installations requiring servicing, inspection, and/or cleaning should have unobstructed, unrestricted, and ready access ·
- Hand, knee and foot railings should be installed on stairs, fixed ladders, platforms, permanent and interim floor openings, loading bays, ramps, etc.
- Openings should be sealed by gates or removable chains ·
- Covers should, if feasible, be installed to protect against falling items ·
- Measures to prevent unauthorized access to dangerous areas should be in place

First Aid ·

- The employer should ensure that qualified first-aid can be provided at all times. Appropriately equipped first-aid stations should be easily accessible throughout the place of work ·
- Eye-wash stations and/or emergency showers should be provided close to all workstations where immediate flushing with water is the recommended first-aid response ·
- Where the scale of work or the type of activity being carried out so requires, dedicated and appropriately equipped firstaid room(s) should be provided. First aid stations and rooms should be equipped with gloves, gowns, and masks for protection against direct contact with blood and other body fluids ·
- Remote sites should have written emergency procedures in place for dealing with cases of trauma or serious illness up to the point at which patient care can be transferred to an appropriate medical facility.

OHS Training ·

- Provisions should be made to provide OHS orientation training to all new employees to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow employees. ·
- Training should consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Any site-specific hazard or color coding in use should be thoroughly reviewed as part of orientation training.

Area Signage ·

- Hazardous areas (electrical rooms, compressor rooms, etc), installations, materials, safety measures, and emergency exits, etc. should be marked appropriately.
- Signage should be in accordance with international standards and be well known to, and easily understood by workers, visitors and the general public as appropriate.

Labeling of Equipment ·

- All vessels that may contain substances that are hazardous as a result of chemical or toxicological properties, or temperature or pressure, should be labeled as to the contents and hazard, or appropriately color coded. ·
- Similarly, piping systems that contain hazardous substances should be labeled with the direction of flow and contents of the pipe, or color coded whenever the pipe passing through a wall or floor is interrupted by a valve or junction device.

Industrial Vehicle Driving and Site Traffic

Poorly trained or inexperienced industrial vehicle drivers have increased risk of accident with other vehicles, pedestrians, and equipment. Industrial vehicles and delivery vehicles, as well as private vehicles on-site, also represent potential collision scenarios. Industrial vehicle driving and site traffic safety practices include:

- Training and licensing industrial vehicle operators in the safe operation of specialized vehicles such as forklifts, including safe loading/unloading, load limits ·
- Ensuring drivers undergo medical surveillance ·
- Ensuring moving equipment with restricted rear visibility is outfitted with audible back-up alarms ·
- Establishing rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures (e.g. prohibiting operation of forklifts with forks in down position), and control of traffic patterns or direction ·
- Restricting the circulation of delivery and private vehicles to defined routes and areas, giving preference to 'one-way' circulation, where appropriate

Ergonomics, Repetitive Motion, Manual Handling

Injuries due to ergonomic factors, such as repetitive motion, overexertion, and manual handling, take prolonged and repeated exposures to develop, and typically require periods of weeks to months for recovery. These OHS problems should be minimized or eliminated to maintain a productive workplace. Controls may include: ·

- Facility and workstation design with 5th to 95th percentile operational and maintenance workers in mind ·
- Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds ·
- Selecting and designing tools that reduce force requirements and holding times, and improve postures ·
- Providing user adjustable work stations ·
- Incorporating rest and stretch breaks into work processes, and conducting job rotation ·
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions ·
- Taking into consideration additional special conditions such as left handed persons

Monitoring

Occupational health and safety monitoring programs should verify the effectiveness of prevention and control strategies. The selected indicators should be representative of the most significant occupational, health, and safety hazards, and the implementation of prevention and control strategies. The occupational health and safety monitoring program should include:

- Safety inspection, testing and calibration
- Surveillance of the working environment
- Surveillance of workers health
- Training

7. Analysis of Alternatives

Given the nature of Model regional hub activities, the consideration of alternatives is of prime importance. The alternatives analysis will be conducted during the comprehensive ESIA stage in future. This section proposed the alternative analyses angles in terms of site, technology and waste management options.

7.1. Description of alternative locations

The alternative selection for project location shall be based on economic, engineering and topographic justifications. Site selection shall be conducted prior to establishing a final developmental site. While some locations may have more inherent environmental problems, other locations could be more ideal. Sites with inherent environmental problems should be avoided, and sites with fewer constraints and the maximum capacity to sustainably assimilate the development shall be selected. The final location selected for the anticipated Model Regional hub shall be based on economic, engineering and topographic justifications. In relation to the proposed project, three alternatives shall be taken in to consideration after which the best alternative shall been selected for implementation. The brief description of the alternative analysis has to been presented.

7.2. Alternative designs and processes

The design alternative selection will be based the need to minimize environmental impacts including, noise, odour and aspect; optimum capital and running costs and land area requirements.

Typical approach towards alternative anticipated Model regional hub designs can be included the following:

(i) minimization of environmental impacts including, noise, odour and aspect;
(ii) optimum capital and running costs;
(iii) land area requirements;
(iv) distance from sensitive social receptors such as schools, hospitals etc.

7.3. No project “Zero” alternative

The no-project alternative is often defined by the baseline information and is crucial in the assessment of impact because other alternatives are weighed with reference to it. From the qualitative analysis and the summary of the proposed site for the project, there will not be any significant negative effect on either the biophysical or the socio-cultural environment of the proposed project. Without the project, the environmental situation will neither improve nor can we say that it will necessarily deteriorate. The no-project option will however lead to the following (general) major negative and long-term impacts:

- The economic status of residents will remain unchanged.
- The increasing demand for quality meat products for local and potential export market will not be addressed;
- The County Government Ovorkhangai priority focus on agro-processing and industrialization will not be achieved;
- No employment and business opportunities will be created for the County residents;
- No multiplier investments opportunities for the livestock sector associated with Model regional hub such as abattoirs, packaging services and others will be established;

- Discouragement for investors and loaners for investment projects in Ovorkhangai province;
- Development of infrastructural facilities (roads and associated infrastructure) will not be undertaken;
- Likely levels of poverty will increase or remain the same;
- Modernization of value chain and value addition to livestock products will not be achieved.

7.4. Analysis of alternative construction materials and technology

The anticipated Model regional hub is expected to meet all the national and international standards for a modern warehouses. It must be constructed using modern, preferably locally and internationally accepted materials to achieve public health, safety, security and environmental aesthetic requirements. The Model regional hub works will be made using locally sourced materials that meet the national and international requirements.

7.5. Waste management alternative

The waste management alternative should be selected emphasized on the need to minimize waste generated from the facility through most practical and feasible options including recycling of both liquid and solid wastes generated in all phases of the project. The most feasible options should be selected for solid wastes with combined recycling processes including biogas production, composting and rendering. For liquid wastes the selected alternative was biological processes including lagoons with anaerobic and aerobic processes.

A lot of solid wastes will be generated from the proposed project. An integrated solid waste management system is recommendable. First, the proponent will give priority to reduction at source of the materials. Recycling and reuse options of the waste will be the second alternative in priority. This will call for a source separation program to be put in place. Finally, the proponent will need to engage licensed waste management dealers to ensure regular waste removal and disposal in an environmentally-friendly manner. In this regard, a Ministry of Environment and Tourism registered solid waste handler would have to be engaged. This is the most practical and feasible option for solid waste management considering the delineated options at all the three phases of the project. Wastewater management will apply a combination of aerobic and anaerobic systems.

7.6. Incremental alternatives

Incremental alternatives are modifications or variations to the design of a project that provide different options to reduce or minimize environmental impacts. There are several incremental alternatives that can be considered, including: The design or layout of the activity including the technology/materials to be used in the activity.

8. Environmental and Social Management Plan

An Environmental and Social Management plan, including the environmental and social impacts and mitigation measures, organization and responsibilities, monitoring plan, trainings, grievance redress mechanism, information management and estimated ESMP implementation cost, will be prepared during the comprehensive ESIA stage.

APPENDIX1: ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES

General

1. The Contractor and his employees shall adhere to the mitigation measures set down in these specifications to prevent harm and nuisances on local communities, and to minimize the impacts in construction and operation on the environment.

2. Remedial actions which cannot be effectively carried out during construction should be carried out on completion of the works (and before issuance of the acceptance of completion of works):

   (a) All affected areas should be landscaped and any necessary remedial works should be undertaken without delay, including grassing and reforestation;
   (b) water courses should be cleared of debris and drains and culverts checked for clear flow paths; and
   (c) All sites should be cleaned of debris and all excess materials properly disposed;
   (d) Borrow pits should be restored.

Construction Activities and Environmental Rules for Contractors

The following information is intended solely as broad guidance to be used in conjunction with local and national regulations. Before initiation of construction activities, the Contractor shall present the Project Engineer with a Construction Plan which explicitly states how he plans to abide by these specifications. After approval of such Plan by the Project Engineer, construction activities can proceed.

Prohibitions

The following activities are prohibited on or near the project site:

1. Cutting of trees for any reason outside the approved construction area;
2. Hunting, fishing, wildlife capture, or plant collection;
3. Use of unapproved toxic materials, including lead-based paints, asbestos, etc.;
4. Disturbance to anything with architectural or historical value;
5. Building of fires;
6. Use of firearms (except authorized security guards);
7. Use of alcohol by workers.

Transport

The Contractor shall use selected routes to the project site, as agreed with the Project Engineer, and appropriately sized vehicles suitable to the class of roads in the area, and shall restrict loads to prevent damage to local roads and bridges used for transportation purposes. The Contractor shall be held responsible for any damage caused to local roads and bridges due to the transportation of excessive loads, and shall be required to repair such damage to the approval of the Project Engineer.

The Contractor shall not use any vehicles, either on or off road with grossly excessive, exhaust or noise emissions. In any built up areas, noise mufflers shall be installed and maintained in good condition on all motorized equipment under the control of the Contractor.

Adequate traffic control measures shall be maintained by the Contractor throughout the duration of the Contract and such measures shall be subject to prior approval of the Project Engineer.

Workforce and Camps

The Contractor should whenever possible locally recruit the majority of the workforce and shall provide appropriate training as necessary.

The Contractor shall install and maintain a temporary septic tank system for any residential labor camp and without causing pollution of nearby watercourses.

The Contractor shall establish a method and system for storing and disposing of all solid wastes generated by the labor camp and/or base camp.

The Contractor shall not allow the use of fuel wood for cooking or heating in any labor camp or base camp and provide alternate facilities using other fuels.

The Contractor shall ensure that site offices, depots, asphalt plants and workshops are located in appropriate areas as approved by the Project Engineer and not within 500 meters of existing residential settlements and not within 1,000 meters for asphalt plants.

The Contractor shall ensure that site offices, depots and particularly storage areas for diesel fuel and bitumen and asphalt plants are not located within 500 meters of watercourses, and are operated so that no pollutants enter watercourses, either overland or through groundwater seepage, especially during periods of rain. This will require lubricants to be recycled and a ditch to be constructed around the area with an approved settling pond/oil trap at the outlet.

The contractor shall not use fuel wood as a means of heating during the processing or preparation of any materials forming part of the Works.

Waste Management and Erosion:

Solid, sanitation, and, hazardous wastes must be properly controlled, through the implementation of the following measures:

Waste Management:

1. Minimize the production of waste that must be treated or eliminated.
2. Identify and classify the type of waste generated. If hazardous wastes are generated, proper procedures must be taken regarding their storage, collection, transportation and disposal.
3. Identify and demarcate disposal areas clearly indicating the specific materials that can be deposited in each.
4. Control placement of all construction waste (including earth cuts) to approved disposal sites (>300 m from rivers, streams, lakes, or wetlands). Dispose in authorized areas all of garbage, metals, used oils,

and excess material generated during construction, incorporating recycling systems and the separation of materials.

Erosion Control:

Disturb as little ground area as possible, stabilize that area as quickly as possible, control drainage through the area, and trap sediment onsite. Erect erosion control barriers around perimeter of cuts, disposal pits, and roadways

Conserve topsoil with its leaf litter and organic matter, and reapply this material to local disturbed areas to promote the growth of local native vegetation.

Apply local, native grass seed and mulch to barren erosive soil areas or closed construction surfaces.

Apply erosion control measures before the rainy season begins preferably immediately following construction. Install erosion control measures as each construction site is completed.

In all construction sites, install sediment control structures where needed to slow or redirect runoff and trap sediment until vegetation is established. Sediment control structures include windrows of logging slash, rock berms, sediment catchment basins, straw bales, brush fences, and silt

Control water flow through construction sites or disturbed areas with ditches, berms, check structures, live grass barriers, and rock

Maintain and reapply erosion control measures until vegetation is successfully established.

Spray water on dirt roads, cuts, fill material and stockpiled soil to reduce wind-induced erosion, as needed

Maintenance:

Identify and demarcate equipment maintenance areas (>15m from rivers, streams, lakes or wetlands). Fuel storage shall be located in proper areas and approved by the Project Engineer.

Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas; never dispose spent oils on the ground, in water courses, drainage canals or in sewer systems.

All spills and collected petroleum products shall be disposed of in accordance with standard environmental procedures/guidelines. Fuel storage and refilling areas shall be located at least 300m from all cross drainage structures and important water bodies or as directed by the Engineer.

Earthworks, Cut and Fill Slopes

All earthworks shall be properly controlled, especially during the rainy season.

The Contractor shall maintain stable cut and fill slopes at all times and cause the least possible disturbance to areas outside the prescribed limits of the works.

The Contractor shall complete cut and fill operations to final cross-sections at any one location as soon as possible and preferably in one continuous operation to avoid partially completed earthworks, especially during the rainy season.

In order to protect any cut or fill slopes from erosion, in accordance with the drawings, cut off drains and toe-drains shall be provided at the top and bottom of slopes and be planted with grass or other plant cover. Cut off drains should be provided above high cuts to minimize water runoff and slope erosion.

Any excavated cut or unsuitable material shall be disposed of in designated disposal areas as agreed to by the Project Engineer.

Disposal sites should not be located where they can cause future slides, interfere with agricultural land or any other properties, or cause soil from the dump to be washed into any watercourse. Drains may need to be dug within and around the tips, as directed by the Engineer

Stockpiles and Borrow Pits

Operation of a new borrowing area, on land, in a river, or in an existing area, shall be subject to prior approval of the local authorities and Project Engineer for technical suitability. Borrow pits shall be prohibited where they might interfere with the natural or designed drainage patterns. River locations shall be prohibited if they might undermine or damage the river banks, or carry too much fine material downstream.

The Contractor shall ensure that all borrow pits used are left in a trim and tidy condition with stable side slopes, and are drained ensuring that no stagnant water bodies are created which could breed mosquitoes.

Rock or gravel taken from a river shall be far enough removed to limit the depth of material removed to one-tenth of the width of the river at any one location, and not to disrupt the river flow, or damage or undermine the river banks.

The location of crushing plants shall be subject to the approval the authorities , and not be close to environmentally sensitive areas or to existing residential settlements, and shall be operated with approved fitted dust control devices.

In any borrow pit and disposal site, the Contractor shall:

1. Identify and demarcate locations for stockpiles and borrow pits, ensuring that they are 15 meters away from critical areas such as steep slopes, erosion-prone soils, and areas that drain directly into sensitive water bodies
2. Limit extraction of material to approved and demarcated borrow pits.
3. Stockpile topsoil when first opening the borrow pit. After all usable borrow has been removed, the previously stockpiled topsoil should be spread back over the borrow area and graded to a smooth, uniform surface, sloped to drain. On steep slopes, benches or terraces may have to be specified to help control erosion.
4. Excess overburden should be stabilized and revegetated. Where appropriate, organic debris and overburden should be spread over the disturbed site to promote revegetation. Natural revegetation is preferred to the extent practicable.
5. Existing drainage channels in areas affected by the operation should be kept free of overburden.

6. Once the job is completed. all construction -generated debris should be removed from the site.

Disposal of Construction and Vehicle Waste

The Contractor shall establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for construction debris

Debris generated due to the dismantling of the existing structures shall be suitably reused, to the extent feasible, in the proposed construction (e.g. as fill materials for embankments). The disposal of remaining debris shall be carried out only at sites identified and approved by the Project Engineer. The contractor should ensure that these sites (a) are not located within designated forest areas; (b) do not impact natural drainage courses; and (c) do not impact endangered/rare flora. Under no circumstances shall the contractor dispose of any material in environmentally sensitive areas.

In the event any debris or silt from the sites is deposited on adjacent land, the Contractor shall immediately remove such, debris or silt and restore the affected area to its original state to the satisfaction of the Project Engineer.

All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, where necessary, will be considered incidental to the work and should be planned and implemented by the contractor as approved and directed by the Engineer.

Safety during Construction

The Contractor's responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all national and local safety requirements and any other measures necessary to avoid accidents, including the following:

1. Carefully and clearly mark pedestrian-safe access routes;
2. If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours;
3. Maintain supply of supplies for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction;
4. Conduct safety training for construction workers prior to beginning work;
5. Provide personal protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed and –shanked boots, etc.,) for construction workers and enforce their use;
6. Require that all workers read, or are read, all safety guidelines. Encourage workers to share the information with their physicians, when relevant;
7. Ensure that the asbestos-containing materials or other toxic substances are not used;
8. During heavy rains or emergencies of any kind, suspend all work.
9. Brace electrical and mechanical equipment to withstand seismic events during the construction.

Nuisance and Dust Control

To control nuisance and dust the Contractor should:

1. Maintain all construction-related traffic at or below 15 mph on streets within 200 m of the site;
2. Maintain all on-site vehicle speeds at or below 10 mph.

3. To the extent possible, maintain noise levels associated with all machinery and equipment at or below 90 db.
4. In sensitive areas (including residential neighborhoods, hospitals, rest homes, etc.) more strict measures may need to be implemented to prevent undesirable noise levels.
5. Minimize production of dust and particulate materials at all times, to avoid impacts on surrounding families and businesses, and especially to vulnerable people (children, elders).
6. Phase removal of vegetation to prevent large areas from becoming exposed to wind.
7. Place dust screens around construction areas, paying particular attention to areas close to housing, commercial areas, and recreational areas.
8. Spray water as needed on dirt roads, cut areas and soil stockpiles or fill material.
9. Apply proper measures to minimize disruptions from vibration or noise coming from construction activities.

Community Relations

To enhance adequate community relations the Contractor shall:

1. Inform the population about construction and work schedules, interruption of services, traffic detour routes and provisional bus routes, as appropriate.
2. Limit construction activities at night. When necessary ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures.
3. At least five days in advance of any service interruption (including water, electricity, telephone, bus routes) the community must be advised through postings at the project site, at bus stops, and in affected homes/businesses.
4. Code of conduct for workers to be observed to minimize negative impact to local communities.

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Physical Cultural Property Chance-finds Procedures

If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:

(a) Stop the construction activities in the area of the chance find;
(b) Delineate the discovered site or area;
(c) Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the National Culture Administration take over;
(d) Notify the supervisory Engineer who in turn will notify the responsible local authorities and the National Culture Administration immediately (within 24 hours or less);
(e) Responsible local authorities and the National Culture Administration would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archeologists of National Culture Administration. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
(f) Decisions on how to handle the finding shall be taken by the responsible authorities and National Culture Administration. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage;

(g) Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities; and
(h) Construction work could resume only after permission is given from the responsible local authorities or National Culture Administration concerning safeguard of the heritage.

HIV/AIDS Education

The Contractor shall ensure that detection screening of sexually transmitted diseases, especially with regard to HIV/AIDS, amongst laborers is actually carried out and will submit a certificate of compliance to the Head Construction Engineer.

Environmental Supervision during Construction

The Project Engineer will supervise compliance with these specifications. Major non-compliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the Project Engineer. Contractors are also required to comply with national and municipal regulations governing the environment, public health and safety.