Ministry of Environment, Water and Climate

FORESTRY COMMISSION

Hwange Sanyati Biological Corridor Project: Wood Drying Kiln Activity

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Compiled by BSES Consultants, Bulawayo

SEPTEMBER 2019


FOREST HILL OFFICE
LUPANE DISTRICT

Executive Summary

Forestry Commission (FC) is currently implementing one of the Hwange Sanyati Biological Corridor Project (HSBCP) components dedicated to improving forestry and land management. HSBCP seeks to support the ecological health of the biological corridor through a series of interventions to strengthen the land use and resource management capacity of managers and communities. This was achieved through implementing partners that include Forestry Commission, the Environmental Management Agency (EMA), the Parks and Wildlife Management Authority (PWMA) and the Community Areas Management Programme for Indigenous Resources (CAMPFIRE) Association with World Wide Fund for Nature (WWF) as the executing agent. The project is financed by the Global Environment Facility (GEF) and administered through the World Bank. The HSBCP has an Environmental and Social Management Framework (ESMF), a Process Framework (PF) and an Indigenous Peoples Planning Framework (IPF).

The Forestry Component supports improved forest and wildlife management in Zimbabwe. Under the auspices of the project, FC has acquired a wood kiln dryer as a key strategy to enhance Zimbabwe's competitive advantage in indigenous timber production. Mukwa (*Pterocarpus angolensis*), teak (*Baikiaea plurijuga*) and mahogany (*Afzelia quanzensis*) and Rose wood (*Guibortia coleosperma)* will be harvested and dried in the kiln. The timber will be sourced from Gwaai forest that does not have any community living in it. There are therefore no tenure related issues with communities.

In compliance with the Environmental Management Act, Chapter 20:27, and the World Bank Operational Policy 4.01 Environmental Assessment, this Environment and Social Management Plan (ESMP) governs control and mitigation of the environmental and social risks associated with the construction and installation of the kiln. This ESMP is an environmental and social safeguards management

instrument under the HSBCP Environmental and Social Management Framework (ESMF). The ESMF provides an analysis of environmental and social risks of the HSBCP as well as a set of procedures and approaches that guide the overall management of these risks in the project as guided by national policies and laws as well as World Bank safeguard policies and guidelines.

The main impacts identified include those associated with Gwaai Forest as the source of the timber and the site-specific impacts where the kiln will be installed. Source forest impacts of concern are deforestation, possible erosion of fragile Kalahari sands and the occupational health and safety of workers extracting timber in Gwaai forest. The bulk of the trees contained in this forest is of high commercial value (teak, mukwa, mahogany and rosewood) as indicated in the harvesting plan for block K of Gwaai Forest Reserve. *See Annex 5*. The main impacts of concern associated with the kiln installation are the minor, temporary site-specific impacts from preparing the small concrete foundation upon which the kiln will be erected as well as health and safety of the workers during construction, installation and actual kiln operation. It is worth noting that the kiln will be installed within the premises of an existing sawmill in Gwaai forest. The main concerns during operation of the kiln will again be health and safety of the workers with respect to sawdust, smoke from wood off cuts firing the boiler, dust from use of existing gravel access roads in dispatching the kiln-dried timber. Key to note is that there are no indigenous peoples or physical cultural property in the project impacted zones.

The Forest Management Plan addresses most of the mitigation measures and monitoring that will be followed with respect to impacts on Gwaai forest from which timber will be extracted. Only selected trees from the target species will be cut according to the Harvesting Plan. There will not be any clear cutting that would lead to degradation of land and soils of the fragile Kalahari sand ecosystems, which house much of the teak and mukwa species to be harvested. Kiln related construction concerns will be mitigated by use of personal protective

and safety equipment (PPE) such as masks and boots to be supplied by FC. Kiln related operational impacts will also be mitigated by worker use of PPE and an EMA licensed and regulated smokestack or chimney that will prevent smoke or soot from being released into the atmosphere within acceptable EMA levels. Noting the non-hazardous nature of the emissions (ash, smoke, water vapor) coming from burning of the wood offcuts for powering the boiler, scrubbers will be used for pollution abatement. The project produces environmental benefits, among others, in that it will use the timber offcuts from the sawmill to power the kiln.

Project affected peoples and entities, including workers, may register complaints using the FC Grievance Redress Mechanism (GRM). Such parties can also lodge complaints with the HSBCP Grievance Redress Mechanisms (GRM), WWF-Zimbabwe (as the executing agency of the HSBCP) and the World Bank until project close out on 30 December 2019.

While other monitoring entities, as specified under the Environmental and Social Management Plan such as EMA, the National Social Security Authority (NSSA), the Ministry of Health, etc. are responsible for conducting routine inspections, Forestry Commission has the main oversight in implementation and self-monitoring of this ESMP. The HSBCP PIU will also oversee implementation of this ESMP until the end of 2019.

This ESMP was publicly consulted with key stakeholders in the Lupane District Development Committee on the 25th of June 2019. The project was welcomed as a value addition and beneficiation programme with special mention of safety related issues including protective clothing for the workers. A record of the meeting proceedings will be available for public viewing in accordance with the EMA Act. Hard copies of this ESMP will be available at all levels including the Forestry Commission Head Office, provincial offices and on the kiln site itself at Forest Hill in Gwaai to facilitate training and familiarisation with the impact monitoring

mechanisms proposed and put in place. The Forestry Commission website also houses the HSBCP ESMF and a link to the ESMP can be created once approved.

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ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
CAMPFIRE	Community Areas Management Programme for Indigenous Resources
DA	District Administrator
EHS	Environmental, Health, and Safety
EMA	Environmental Management Agency
ESMP	Environmental and Social Management Plan
FC	Forestry Commission
HFN	Harare Forest Nursery
HIV	Human immunodeficiency Virus.
HSBCP	Hwange Sanyati Biological Corridor Project
KD	Kiln Dried
LRDC	Lupane Rural District Council
NMMZ	National Museum and Monument of Zimbabwe
NSSA	National Social Security Authority
OHS	Occupational Health and Safety
PPE/C	Personal Protective Equipment/Clothing
PWMA	Parks and Wildlife Management Authority
REDD+	Reduced Emission from Deforestation and Forest Degradation.
RTE&V	Rare, Threatened, Endangered and Vulnerable species
SFM	Sustainable Forest Management
STIs	Sexually transmitted infections
WMP	Waste Management Plan
WWF	World Wildlife Fund for Nature
ZETDC	Zimbabwe Electricity Transmission and Distribution Company
ZINWA	Zimbabwe National Water Authority
ZRP	Zimbabwe Republic Police

1. Introduction

Forestry Commission (FC) is currently implementing one of the Hwange Sanyati Biological Corridor Project (HSBCP) components dedicated to improving forestry and land management. HSBCP seeks to support the ecological health of the Hwange Sanyati Biological Corridor through a series of interventions to strengthen the land use and resource management capacity of managers and communities. This was achieved through implementing partners that include Forestry Commission, the Environmental Management Agency (EMA), the Parks and Wildlife Management Authority (PWMA) and the Community Areas Management Programme for Indigenous Resources (CAMPFIRE) Association with World Wide Fund for Nature (WWF) as the executing agent.

Under the auspices of the project, FC has acquired a wood kiln dryer as a key strategy to enhance Zimbabwe's competitive advantage in indigenous timber production. Mukwa(*Pterocarpus angolensis*), teak (*Baikiaea plurijuga*) and mahogany (*Afzelia quanzensis*) and rosewood (*Guibortia coleosperma)* will be harvested and dried in the kiln. The timber will be sourced from Gwaai forest. *See harvesting plan in Annex 5 for the Gwaai Forest Reserve.*

In compliance with the Environmental Management Act, Chapter 20:27, and the World Bank Operational Policy 4.01 Environmental Assessment, this Environment and Social Management Plan (ESMP) governs control and mitigation of the environmental and social risks associated with the construction and installation of the kiln. This ESMP is an environmental and social safeguards management instrument under the HSBCP Environmental and Social Management Framework (ESMF). The ESMF is an analysis of environmental and social risks of the HSBCP as well as a set of procedures and approaches that guide the overall management of these risks in the project as guided by the World Bank and national policies and laws. While other monitoring entities as specified under the Environmental Management Plan (EMA, NSSA, Ministry of Health etc.) are responsible for conducting routine inspections, Forestry Commission has oversight in implementation and monitoring of this ESMP.

2. Project Background

The Government of Zimbabwe is implementing a Global Environment Facility (GEF-5) funded Hwange Sanyati Biodiversity Corridor Project (HSBCP) which started in 2015. The project covers an area of 5.7 million ha in the north western part of the country. Its overall objective is "to develop land use and resource management capacity of managers and communities in the HSBCP of Zimbabwe". One of the HSBC project components is to improve forestry and land management. The forestry component supports improved forest and wildlife

management as well as REDD+ activities as a tool for good forest stewardship in Zimbabwe (World Bank 2014).

As one of the project's strategic focus on Sustainable Forest Management (SFM), the project purchased a kiln as a key value addition proposition and a control and monitoring measure for harvesting of the hard wood timber. Indigenous hardwood timber mainly teak, mukwa, rosewood and mahogany are of very high value if compared to pine. It is used to manufacture furniture, flooring, decking, staircases and other products mainly targeting the elite community. This timber takes a long time to mature, at least 160 years to get to exploitable maturity. It is a natural resource that needs to be exploited sustainably and value added to beneficiate the nation. The Government of Zimbabwe put up a statutory instrument (SI) that prohibits the exporting of raw indigenous hardwood preferring it to be value added to fetch a premium price.

This hardwood timber is one of Zimbabwe's natural resource with potential to earn the country foreign currency if it is sustainably exploited and value added. The Forestry Commission invests a lot of resources annually to conserve and protect them against poaching, destruction by fires and agents of deforestation. It therefore needs to unlock the potential in this resource and gain maximum returns from the efforts put to conserve these vast forest resources through sustainable harvesting, efficient utilisation and selling at the right price commensurate with its value.

The Zimbabwe Government's 10-Point Plan for Economic Growth, Point-2 speaks to 'Advancing Beneficiation and/or Value Addition to our Agricultural and Mining resource endowment'. Forestry Commission saw the potential locked in this timber resource but lacked capacity to unlock it. The Government has since stopped providing funding for operations and capital investments in parastatals like FC encouraging them to enter into revenue generating activities to sustain themselves. It is against this background that FC considers exploring

opportunities along the hardwood line from the exploited resource in the Matabeleland region.

2.1 Project Rationale

Forestry Commission currently harvests the hardwood timber from and processes it into sawn timber at Gwaai sawmill in Matabeleland North. The timber produced is sold as wet-off sawn timber at the sawmill and through the retail outlet-Harare Forest Nursery (HFN). On the market, preference is skewed in favour of Kiln Dried (KD) timber that costs on average $1200/m^3, about 85% more than the average retailing price for wet-off saw of $650.00/m^3.

Forestry Commission has identified one key area requiring attention in the hardwood business value chain where great opportunities are missed.

- Forestry Commission has failed to capture the hardwood market due to failure to supply kiln dried timber. All the timber produced is sold to local manufacturers some of whom export finished products like flooring and decking.
- It requires at least 3 months to air dry the timber which does not even effectively reach the ideal 12% Equilibrium Moisture Content (EMC). Some sales opportunities are lost through holding timber for three months for it to dry compared to only 2 to 4 weeks to dry in the kilns. Air dried timber therefore requires a longer production planning horizon.
- Selling wet-off sawn timber in the market is contrary to the kiln dried timber preference meaning FC is not meeting customer expectations.
- Drying timber in the open air exposes it to potential wood borer infestation as the weevils lay eggs inside the timber only to hatch later inside the manufactured product.

The current methods being applied to the exploitation of timber resource leads to a fast depletion of this valuable resource. If this escalates, the organisation will

continue to offer logging concessions to people who harvest this timber unsustainably leading to depletion.

In spite of the above, the processed timber is then sold wet at a price far below the value of the product. Wet timber is currently selling at an average of $650.00/m^3 yet dry timber can fetch about $1200.00/m^3. The low price leads to unsustainable cost to the operations. The danger is that manufacturer's will likely look for alternatives like veneer, bamboo or other wood, like Miranda from the Asian countries instead of Zimbabwean timber. Therefore, a policy position to sell KD timber can only be supported by installing a timber dryer.
Properly drying timber improves its workability qualities like plannability, glue-ability and other wood working characteristics. Reduced wood-working challenges improve output for manufacturers thus cutting on production cost. Scale of economies result in lower product price offering thus creating a competitive advantage for Zimbabwean wood manufactured products.

Noting hardwood timber is finite and the slow-going nature of the resource, there is therefore need to scale down harvesting and maximize returns from the available resource. Traditionally, the Forestry Commission has been selling hardwood in log form and as rough sawn wet off-saw timber, forms that do not fetch high prices. Some areas with harvestable timber are given to concessionaires thereby creating internal competition to the Commission. This hardwood timber of mainly Teak, Mukwa, Rosewood and Pod Mahogany, has a higher value than pine. It is used to manufacture furniture and other products mainly targeting the elite community. This timber takes a long time to mature (at least 160 years to get to maturity). It is a natural resource that needs to be exploited sustainably and value added to optimally benefit the nation at the same time economizing on its use through fine processing. Kiln drying is one way to unlock this potential to enable Forestry Commission to gain maximum returns from the efforts put to conserve these vast forest resources.

Air-drying timber increases inventory costs for the manufacturer, in addition to higher haulage costs of transporting moisture laden rough-sawn timber. The Forestry Commission has suffered a number of product returns due to timber borer infestation in the past.

Sustainable harvesting of the hardwood will allow reinvestment of benefits derived from the project which can be passed on to neighbouring communities as part of Corporate Social Responsibility (CSR) through employment creation and downstream wood processing industries. One key element of SFM is increased fibre utilisation. With an improvement of drying timber, waste at factories and manufacturing plants are reduced as proper drying of timber reduces timber defects that are normally associated with open air drying. Local timber millers operating in rural council areas will also benefit from the drying facility which will become a revenue line for the equipment by drying the timber for a fee. Currently companies that are offering drying services charge in excess of USD90.00 for every cubic metre of timber dried.

In view of the above, the Commission has banned selling wet timber in favour of only KD timber. Increased funds from selling the more valuable kiln dried timber will provide a revenue stream and financial relief to the Forestry Commission which lost government financial support in 1 January 2016.

The organization procured a 50m^3 capacity timber drier from Nukor based in South Africa to set up its own kilning facilities in Gwaai Forest Reserve alongside an existing saw milling plant.

2.2 Financial implications

The cost of the kiln was quoted at USD80 000.00 comprising purchase price, shipping, training and commissioning. Civil works for the base of the kiln, rigging for offloading, local labour, trollies, local travel and accommodation will be co – financed by the proponent (Forestry Commission) and the project.

There is need for maximizing value from the limited resource through production efficiencies and value addition. Balancing the desire to sustainably manage the resource and the need to generate revenue will call for value addition for maximum beneficiation.

2.3 Gazetted Forests

Zimbabwe has 24 gazetted indigenous (native) forests that cover about 800,000 ha. Their size ranges from 567ha (Ungwe) to 144,000ha (Gwaai). The forests were gazetted to control harvesting of commercial indigenous timber species used to produce mine props, railway sleepers, flooring parquets, and furniture, thereby safeguarding the sustainability and contribution of forests to ecosystem systems such as watershed management and provision of non-timber forest products and, increasingly, climate change mitigation. See Figure 1 below which shows Zimbabwe's gazetted indigenous forests.

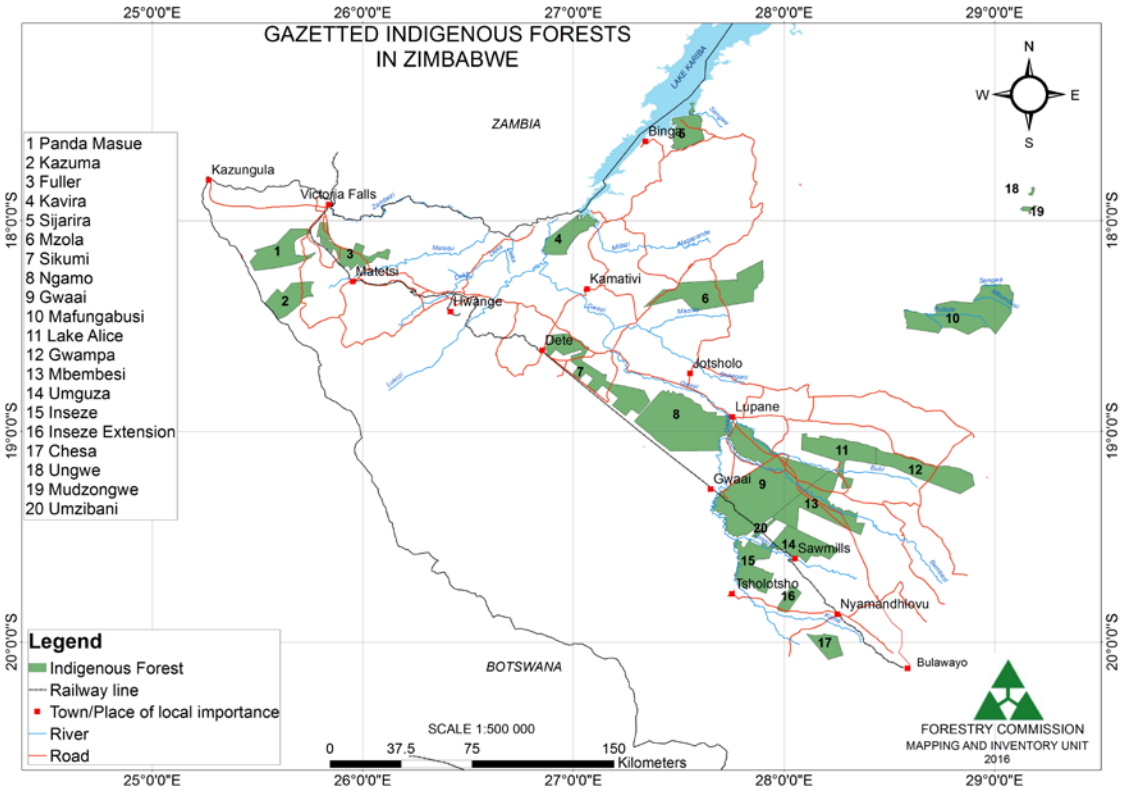

Figure 1: Zimbabwe `s gazetted indigenous forests

Some forests are designated for non-consumptive uses, especially those that border national parks or protected areas. Non consumptive forests refer to those forests where there is no harvesting of timber and forests are left to perform their ecosystem functions.

With respect to this project, timber that will be kiln dried will be sourced from Gwaai Forest, site 9 in the map shown above. Gwaai is not designated as non-consumptive as it was designated to control illegal harvesting of commercial timber and sustain the hardwood timber industry in Bulawayo. In other words, harvesting is allowed in order to sustain the Bulawayo timber industry. Such timber is harvested following carefully prepared harvesting plans to ensure sustainable management of the resource.

The Forestry Commission is the state forestry authority whose mandate is to manage the country's indigenous forests throughout the country. Timber from these forests is harvested, milled and sold through the Commission's timber outlets.

While there has not been enough effort at value-addition leading to Forestry Commission not getting the best value for this unique resource which is highly sought after internationally, the latest national economic blueprint, the Transitional Stabilization Programme (TSP)[1], identifies Value Addition and Beneficiation through timber kiln drying as a critical part in indigenous hardwood timber processing as it ensures that such timber is cleansed of any woodborers and other pathogens which would have the effect of depreciating its utility value.

[1] The Transition Stabilisation Programme is Zimbabwe`s development strategy which provides quick wins to stimulate economic growth and stabilize the macroeconomic and the financial sectors. The policy is anchored on Vision 2030, which seeks to usher Zimbabwe into an upper-middle class economy by 2030 with a per capita income of US$2018 by 2020 and rising to US$5821 by 2030. Value addition and beneficiation in the timber industry sector is one of the key strategies to achieving this.

Biodiversity is protected because for any of these species to be harvested, a harvesting plan which contains a cutting plan has to be prepared and used during exploitation of the species. Only species of a certain size are logged and a representative is always left as a seedbank. Selective cutting guided by a cutting plan prevents erosion protecting any source waters. There will not be any clear cutting. *See Annex 5*. The high costs of managing and exploiting this resource perforce call for production efficiencies, maximum realization of value and improved fibre utilization.

2.4 Forest Source of Timber

The Gwaai Forest will supply the timber for this project. It is a gazetted forest meaning it is legally set aside for particular management purposes and is a natural habitat. Gwaai was one of the first two gazetted forests in the country in 1930 under the Land Apportionment Act in order to establish forest reserves and provide funds for protection and for the closer supervision of timber exploitation. This and other Kalahari sand forests were gazetted to offer ecosystem service such as water catchment protection and areas where commercial timber could be harvested.

Since teak, mukwa, mahogany and rosewood are the four timber species to be dried in the kiln, *Baikiaea plurijuga* forests, also known as 'Kalahari Sand' forests or 'Zambezi Teak' forests are endemic to the Kalahari sand geologic formation in western Zimbabwe. Mukwa, mahogany and rosewood are found along with teak in these forests. The Kalahari forests are endemic to the Kalahari (deep) sands which are found in Zimbabwe, Zambia, Namibia and Botswana.

The teak forests are restricted to deep, loose and well-drained Kalahari sands. The protected forests, comprising over 800 000 ha, are managed by the Forestry Commission for the production of commercial timber and wildlife, the protection of the fragile Kalahari sand system and for biodiversity conservation.

Since they were gazetted the management approach in these forests has consisted mainly in allowing formal public use through licenses and permits only. The management activities include protection from fire, supervision of forest utilization programmes, veldt management to improve wildlife habitat, research on various aspects of the forests, wildlife management, silviculture, control of forest occupants and antipoaching activities.[2]

Protected KS teak forests perform a number of functions that include the protection of the fragile Kalahari sand, the protection of catchment areas for rivers that pass through the forests and flow into the Zambezi River, the provision of wildlife habitat, the conservation of biological diversity and the provision of timber and non-timber products.

The initial motivation for gazetting the forests was to control the wanton harvesting of the commercial indigenous timber species, mainly *Baikiaea plurijuga* (Zambezi teak) and *Pterocarpus angolensis* (mukwa). Timber from these species was mainly used to produce railway sleepers, furniture and mine props. Currently the species are commercially used for various forms of flooring, furniture, veneer and plywood.

The early objectives of gazetting the forest reserves included (a) a general preservationist ethic that prevailed in colonial times which saw huge forest areas being gazetted as protected areas (McGregor, 1991); (b) the forests were considered to be unique as conservation areas, as they are the only example in the country of extensive forest formations on Kalahari sands (Mujakachi, 1992); (c) gazetting provided for the protection of timber stocks, particularly for the mining industry; and (d) they were also gazetted for the protection of water catchments of the upper reaches of the Gwaai, Umgusa, Bembesi, Gwampa, Shangani, Lutope, Sengwa, Kana and Mbumbusi Rivers and tributaries. These

[2] FAO (2007), p ix.

rivers flow into the Zambezi River.[3] Besides timber harvesting, wildlife utilization is currently a major revenue-generating activity in protected forests.[4]

While the kiln will be installed in Gwaai Forest Reserve where the sawmill already exists, the timber for harvest will also be sourced from the Gwaai Forest itself under the management of Forestry Commission. It is a natural indigenous (i.e. not planted with foreign trees) forest and the timber is harvested on a selective cutting method as a forest management process. The timber is selectively harvested by Forestry Commission to derive value for funding conservation activities and maintenance of the forest.

Only trees of commercial value are cut as per cutting plan by the Commission, within prescribed specifications in terms of minimum sizes of trees to be removed and maximum allowable cut to allow the forest to naturally regenerate. This is a management process purposely designed by Forestry Commission for reasons of conservation of the forest.

This is a forest under proper management by Forestry Commission, an authority of government responsible for ensuring forest resources are protected and managed sustainably. In this case, only timber species are harvested commercially while all species listed as protected in the Forest Act will not be cut for forest conservation purposes. The harvesting of the timber is part of the global forest management plan for gazzeted forests and these annual plans are already in place. Cutting plans are used to monitor and control harvesting and monitor off take. On a monthly basis progress reports are produced for management consideration, analysis and interventions where necessary.

There is provision to allow formal use of Gwaai Forest for cultural activities and ritual activities through the continuous community engagement initiative. This

[3] FAO (2007), p 2.
[4] FAO (2007), p 3.

takes into account that these had been in existence before the inception of forest reserves.

2.5 Timber Processing

Gwaai Sawmill is a timber milling facility already established within the gazetted forest which is under the management of Forestry Commission.

In compliance with the requirements of the policy, this ESMP will focus on how to protect the surrounding area where the kiln will be installed from construction and operation of the kiln and contain controls to ensure that the habitats from which the wood will be taken are not damaged; these will be covered by the ESMP.

A sawmill is already in place where timber is being milled and the kiln will be sited at the same place with the mill as an extension of the timber production operation. Standard practice is that the timber should be dried straight from the sawmill for handling reasons, control of variables, sawmill waste (offcuts, the waste left behind after cutting a larger piece) is used to fire the boiler that feeds steam to the kiln. This is a self-contained operation which should ordinarily be established in tandem with timber milling.

Noting that hardwood from indigenous forests is a finite resource, issues with respect to controlled exploitation or harvesting become critical.

The management of the protected KS teak forests is regulated through forest management prescriptions of properly authorized management plans, which are based on the principle of sustained yield. All management plans are based on qualitative and quantitative data and information gathered by respective foresters for each forest reserve. In forest reserves, where forest inventories have been conducted the management plans are based on inventory results data and information. The forest management plans are prepared on two levels, i.e. the level of the whole forest and the community forestry level. The management plans are

approved first at the divisional level and secondly at institutional level, where the plans have to fit into strategic goals of the Forest Commission.[5]

Management activities in the forests include:

1 Forest fire protection;

2 Supervision of forest utilization programmes;

3 Veldt management;

4 Research support on indigenous forests;

5 Wildlife management;

6 Silviculture;

7 Anti-poaching activities; and

8 Community participation.

These activities are carried out under the supervision of the respective foresters of each forest reserve. Each forester has a small team of permanent workers that is complemented by casual workers during the fire season. The forest management plan for Gwaai forest is illustrated in *Annex 4*.

[5] FAO (2007) p 14.

3. Legal, Administrative and Policy Requirements

The kiln will be installed and operate in accordance with national laws, relevant WB Safeguard Policies[6] and Environmental, Health and Safety Guidelines (EHSG)[7] which contain reference levels and other practices.

3.1 National Policies, Laws and Regulations

The specific legislation, laws and Policies to which the Activity is subject are listed and described in *Annex 7.*

3.2 World Bank Requirements

Since the WB supports the HSBCP, its safeguard policies and Environmental, Health and Safety Guidelines apply to this wood drying kiln installation activity. The following safeguard policies are triggered for this Project: OP 4.01 Environmental Assessment, OP 4.04 Natural Habitats, OP 4.10 Indigenous Peoples, OP 4.36 Forests, OP 4.11 Physical Cultural Resources and OP 4.12 Involuntary Resettlement. *See Annex 8* for a brief description of each policy.

The Environmental, Health, and Safety (EHS) Guidelines most important for this project in the General Guidelines[8] are the 1.1 Air Emissions and Ambient Air Quality, 1.3 Wastewater and Ambient Water Quality, 1.6 Waste Management, 1.7 Noise, Occupational Health and Safety (OHS) 2.3 Physical Hazards, 2.7 Personal Protective Equipment (PPE), 3.2 Structural Safety of Project Infrastructure and OHS under Construction/Decommissioning 4.2 as well as 4.3 Community Health and Safety. The relevant industry specific guidelines include the *sawmilling and*

[6] Found at https://www.worldbank.org/en/projects-operations/environmental-and-social-policies.
[7] World Bank Group: International Finance Corporation. *General Environmental, Health, and Safety Guidelines*, **www.ifc.org/ehsguidelines**, April 30, 2007, www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines.
[8] World Bank Group: International Finance Corporation. *General Environmental, Health, and Safety Guidelines*, **www.ifc.org/ehsguidelines**, April 30, 2007.

Wood-based Products Guidelines and *Forest Harvesting Operations.*[9][10] All EHSG are located online at www.ifc.org/ehsguidelines.

4. Detailed Activity Description

Timber will be logged from Gwaai Forest and transported to the sawmill. Standard practice is that the timber should be dried straight from the sawmill for handling reasons, control of variables and utilization of sawmill waste (offcuts) are used to fire the boiler that feeds steam to the kiln will be followed. This is a self-contained operation that will be established in tandem with timber milling.

The kiln will be a small unit occupying less than 300m^2 of ground space within the timber yard where timber used to be stacked for air drying. A concrete slab foundation 21m long, 9m wide and 1.2m deep in extent, including the stacking/cooling timber shed area, will be erected as a base for the kiln. The kiln dimensions will be 8.7m (long) x 7.4m (wide) x 4.95m (high) on the outside and 8.5m (long) x 7.2m (wide) x 3.85m (high) on the inside.

The following components constitute the kiln itself:

- Aluminium body outer and inner shell with a stainless steel skeleton structure of 50m^3 effective drying capacity kiln.
- The kiln chamber has two-way infeed and outfeed design to allow in-feeding from one end and discharge from the other end.
- The kiln structure includes a set of fans, booster coils, water pump, pipes for water distribution, and return.
- An off cut wood fired steam boiler.

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[9] World Bank Group: International Finance Corporation. *Sawmilling & Manufactured Wood Products Environmental, Health, and Safety Guidelines,* **www.ifc.org/ehsguidelines**, April 30, 2007.
[10] World Bank Group: International Finance Corporation. *Forest Harvesting Operations Environmental, Health, and Safety Guidelines*, **www.ifc.org/ehsguidelines**, April 30, 2007.

- A computer control system to monitor the drying process.

The kiln structure is shown in Figure 2 below.

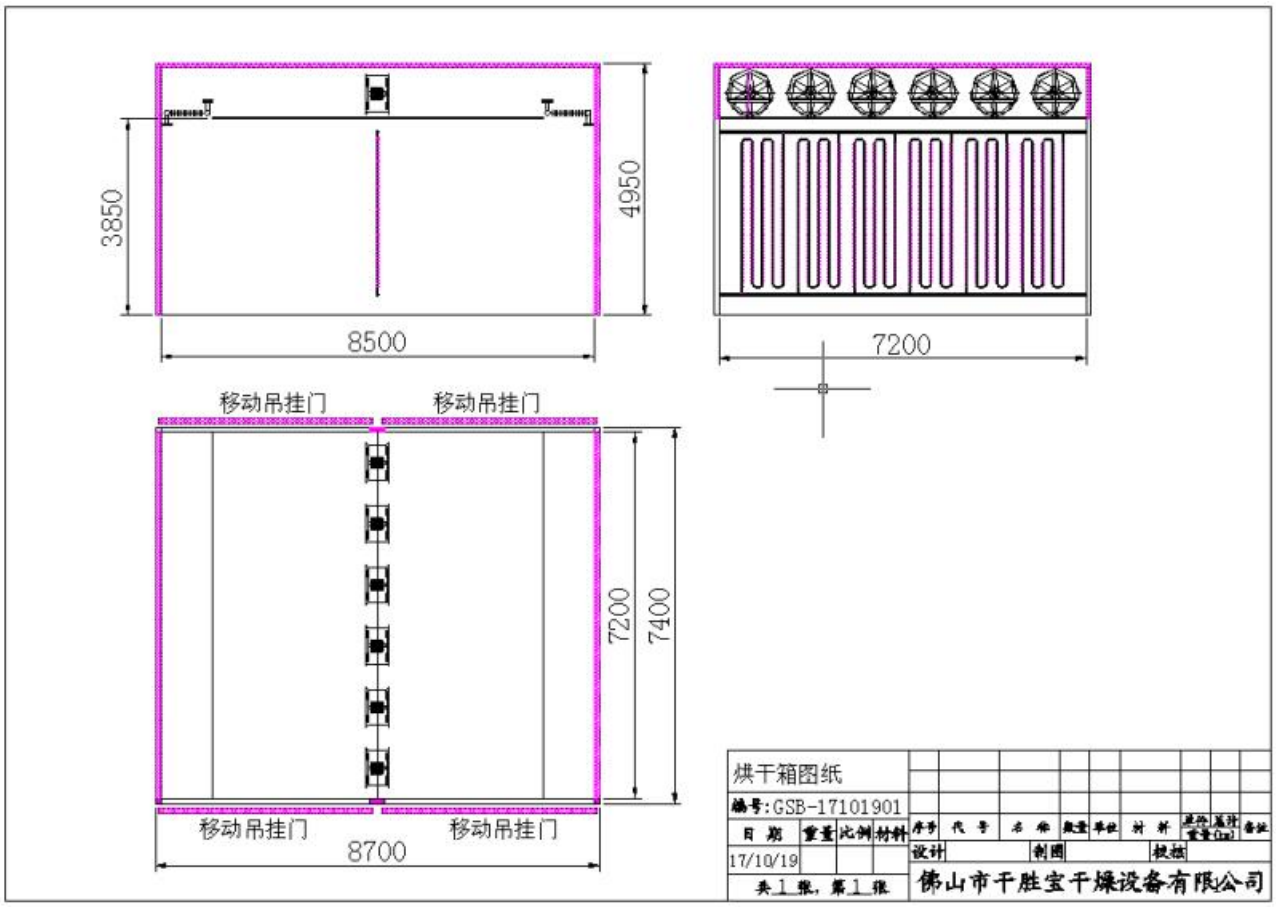


Figure 2: Wood Drying Kiln Diagram

Though not computerized, the kiln is to be run on a timed control system. It comes with a hot water boiler system that runs to a maximum temperature of 95 degrees Celsius sufficient to kill all living organisms inside the timber. The hot water circulates by means of a pump through booster coils in the kiln. The kiln drying is a mechanized process of extracting water through pushing hot air in a closed chamber. Fans move the heated air around the wood to evaporate the moisture until it is reduced to a level called an equilibrium moisture content (EMC). No chemicals are needed for the process and there are no by-products of the process as the timber retains its structure, volume and shape.

When timber is discharged from the kiln chamber after drying it must not be exposed again to the open in order to protect it from weather, rain, direct sun, etc. at the discharge end of the kiln chamber a roof on poles (steel or wooden) is erected to provide the shed for the timber. This is a simple structure to make sure the timber is under cover and protected from weather related damage that will effectively reduce the purchase value of the timber.

The kilning facility will be installed at Gwaai Sawmill site at Forest Hill. After the kiln is installed, Nukor, the kiln supplier, will train employees on how to operate the equipment including the safety and related aspects. See Figure 3 which provides a flow chart of the kiln processing. The project will employ an additional ten (10) people to work directly in the kiln processing unit.

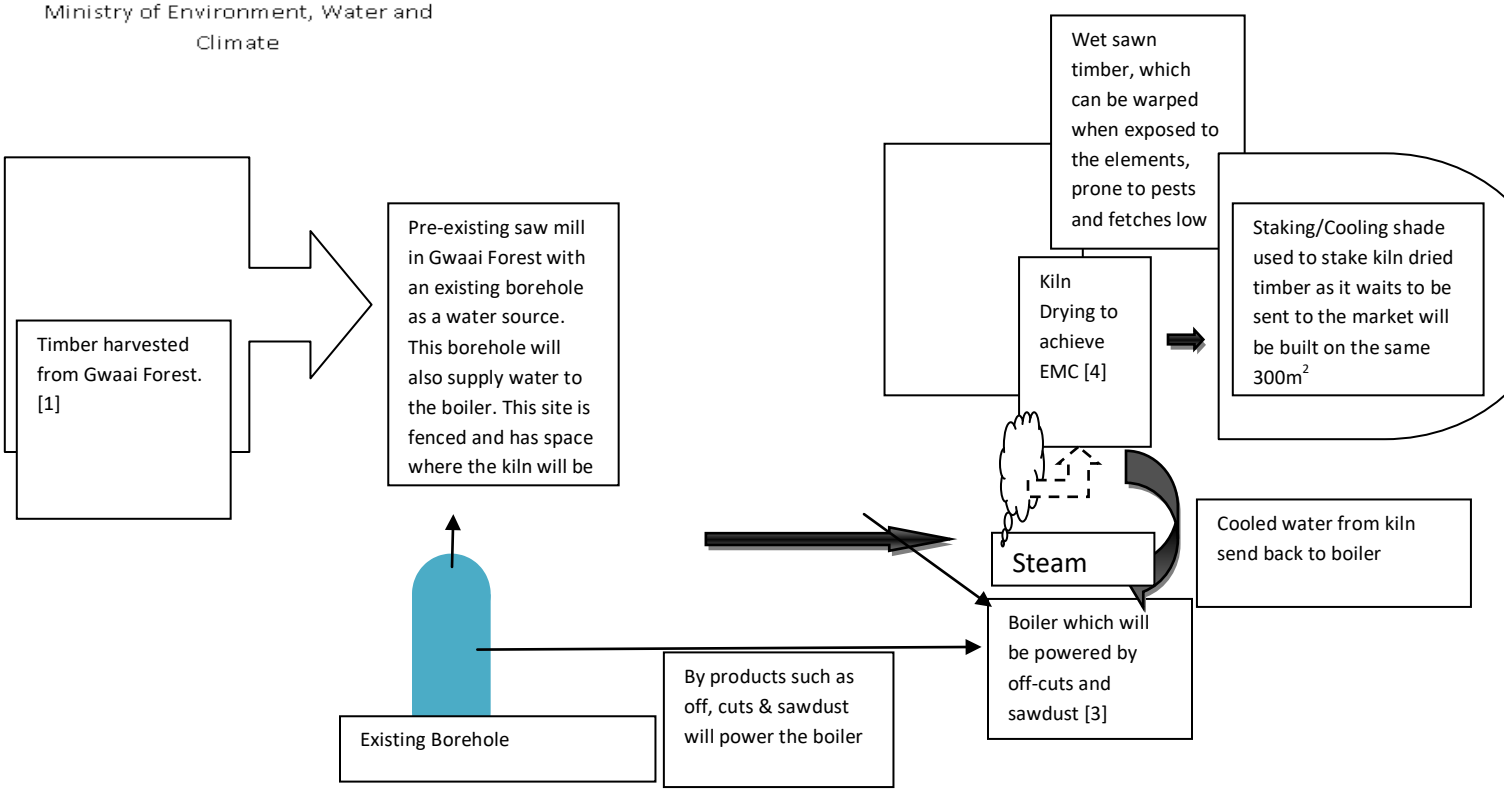


Figure 3: Process Flow Diagram for the Wood Kiln

[1] Harvesting and Cutting plans and Forest Management Plans govern the source forests of round wood supply going to the saw mill and kiln. All the source forests are consumptive (meaning they allow harvesting) sustainably managed by the Forestry Commission and timber extraction is conducted following harvesting and cutting plans.

[2] The Saw mill in Gwaai forest has been in operation for the past decade processing tree species such as (Teak) *Baikiaea plurijuga*, (Mukwa) Pterocarpus angolansis and (Mahogany) *Afzelia quanzensis*. By products (waste) from the saw mill include saw dust and off-cuts which will be used to power the boiler.

[3] The wood kiln chamber will be powered by a boiler which will supply the kilning chamber with steam. Saw-dust and wood offcuts from the nearby sawmill will be burnt to heat the boiler and produce steam for the kiln-drying process proper.

[4] The kiln-drying is a phased steam-drying process that converts sawn wet timber to dried timer at the equilibrium moisture content (EMC).

5: Impact Identification

The kiln dryer activity under HSBCP will have multiple impacts issuing from installation of the dryer, operation of the dryer and the timber extraction. As the kiln will be installed within the premises of an already operating Gwaai sawmill, there are no major concerns on impacts on the flora and fauna of the forest surrounding the site. The major concerns are the health and safety of the workers executing the installation and operation of the kiln. Although the project area where the kiln will be installed is not known to possess any physical cultural resources which include any movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. A chance find procedure is located in the ESMP Mitigation Table 6.1. This ESMP therefore will apply the chance finding procedures to guide the course of action should any physical cultural resources be found.

During construction of the foundation and installation of the kiln itself, small amounts of solid waste and liquid waste will be generated. There are larger impacts from the already operating sawmill right next to the proposed kiln site. Longer term impacts from operation of the kiln are of even less concern than the construction as the kiln is not expected to generate any noise in the drying process. The kiln will only dry wood so solid waste will only be produced if the wood input is defective or somehow made unsuitable after drying.

Timber off cuts (waste) from the sawmill will be used to fire the boiler and smoke will be generated through burning while ash, a by-product from the burning of the off cuts, will need to be disposed of safely. Again, the major concern is the health and safety of the workers who will operate the kiln. In this respect, safety issues from the boiler and loading of timber onto the trolleys are of great concern. Mitigation measures are highlighted in the plan.

Since this operation is within the Gwaai Forest area, a property of the Forestry Commission, it is closed to all outsiders except employees and customers. Since

there are no communities living in and around Gwaai Forest, there are no impacts on community usage of forest resources. Similarly, there are no chances of any conflict over water consumption. The workers and the plant operation will use borehole or underground water.

The other impacts of concern issue from the timber harvesting activities in Gwaai Forest. The hardwood timber to be harvested for this project are the flora species of most ecological importance but they are not considered endangered or threatened by international standards. Similarly, there are no endangered or threatened animal species by international standards that would be impacted by this project's activities. The timber extraction will have minor impacts on wildlife, forest cover, fire ecology and other aspects of the forests. Although there is a Lake Alice/Gwaai Forests Elephant Corridor, it is far away from where the logging activities in Block K will take place so there should be no impacts on elephants. Possible soil degradation is an impact of concern since unlike other savannah forest and woodland formations, Kalahari teak sand forests are the more fragile forests in the sense that their soils (Kalahari sands) are easily degraded once the vegetation cover is removed.[11]

The final impact of concern regarding the forest is the occupational health and safety of workers extracting timber. The Forestry Commission has established systems of hazards identification through Behaviour Based Safety (BBS) where workers participate in hazards identification, safety talks and accident investigation mechanisms as prescribed by the Social Security Authority. NSSA is a government arm responsible for safety and workmans' compensation.

There are no Indigenous Peoples in this activity's areas of influence (the forests).

[11] FAO (2007) p39.

Project site (Within existing Stack yard)

Current wood drying method (Air Drying)

Proposed Project Site (35k0603864 UTM 7880905)

6 Environment and Social Management Mitigation Plan

The preparation of this ESMP was carried out with special emphasis on impact identification, impact analysis and evaluation, through stakeholder consultation and literature review. A participatory and consultative process for key government departments through public consultation was adopted. A district development committee meeting including key stakeholders such as the District Administrator, council officials, other private sectors in the district was held in June of 2019. Literature review targeted various sub project documents to have a clear understanding of the project activities, location and the environmental receptors that are likely to be impacted.

In view of the above project description, the Hwange Sanyati Biodiversity Corridor (HSBC) project Environment and Social Management Framework (ESMF) which outlines the World Bank safeguard policies standards and procedures for the project as well as the local environmental legislation were reviewed for compliance. Reference to checklists in the local environmental guidelines for related projects was made so that the general impacts associated with the proposed project could be identified. A ground truthing exercise was carried out where site consultations were carried out.

Impact analysis and evaluation used the impact matrix methodology which includes among other criterion whether the impact is low, medium or high and whether it is positive or negative. The analysis culminated into the formulation of appropriate mitigation or enhancement measures depending on whether the impacts are positive or negative and proposes the institutional responsibilities for monitoring, implementation of the mitigation or enhancement measures, implementation indicators and frequency for monitoring. Risk and opportunities i.e. aspects/hazards and impacts/risks identification was thus conducted through stakeholders consultations, project impacts brainstorming, project process approach review and site screening checklist review *(Annex 1).* Gwaai Forest is a natural and indigenous forest (meaning native) as opposed to a plantation. The timber is harvested on a selective cutting method as a forest management process. The forests are under management by Forestry Commission, an authority of government responsible for ensuring forest

resources are protected and managed sustainably. In this case, only timber species are harvested commercially while all species listed as protected in the Forest Act will not be cut for forest conservation purposes. The harvesting of the timber is part of the forest management plan *(Annex 4)* for Gwaai. Cutting plans are used to monitor and control harvesting. Refer to *Annex 5*, for a detailed harvesting plan for Gwaai. The area selected for logging, Block K, is far away from the elephant corridor so no elephants should be disturbed.

On a monthly basis, progress reports are produced for management consideration, analysis and interventions where necessary. The timber is selectively harvested by Forestry Commission to derive value for the purpose of funding conservation activities and maintenance of the forest. Only trees of commercial value are cut as per cutting plan by the Commission within prescribed specifications in terms of minimum sizes of trees are removed and maximum allowable diameter are cut to allow the forest to naturally regenerate. A Forestry Commission staff trained in species identification will be in charge of selecting which trees are to be felled according to the relevant harvesting plan (example in Annex 5). There will be no clear cutting which would expose the soils to agents of erosion and lead to land degradation and soil erosion, instead selective cutting method is applied.

This is a management process purposely designed by Forestry Commission for forest conservation. No indigenous (native) timber is cut without authority from Forestry Commission. There are no flora or fauna of high conservation value in Gwaai Forest and thus there is no concern about important endangered or otherwise threatened species being cut and sent to the kiln. Additionally, any timber received by the kiln must have a movement permit from the Forestry Commission.

The construction phase is estimated to last 2 weeks. Mitigation for the minor site-specific impacts is presented below in Table 6.1.

Table 6.1. MITIGATION PLAN

Aspect	Impact	Mitigation Measure	Monitoring Indicators / Frequency	Responsible / Timing	Monitoring Agency
Trenching /Site Clearing	Vegetation destruction and Wildlife Habitat Destruction	• The site already has existing sawmill structure running, the kiln purchased will only be used to mechanically dry the sewn timber to increase the market value of the timber. • No additional vegetation clearing took or will take place.	Daily	Forestry Commission (Proponent) Contractor	EMA
	Increased runoff due to increase in	• Unnecessary clearing of land to be prevented • Construction of drainage	Presence of drainage channels	Contractor	EMA

	impervious surfaces Soil erosion resulting in loss of top soil cover and siltation of the nearby stream	channels on all internal roads to reduce surface runoff and soil erosion • Provide suitable storm water drainage channels during site servicing. • Control construction activities during rainy/wet conditions to control soil movement and gully reclamation. • Re-vegetate exposed surfaces to generate surface covers on the open areas and to control soil movement by erosion agents including water and wind.	On going	Forestry Commission (Proponent)	Forestry Commission

Loading and unloading	Noise	• Adhere to noise exposure limits.	High noise	Forestry	Ministry of

materials, movement of vehicles	propagated to workers	Noise exposures should not exceed the legal limits shown below: Employees - 90dB(A) Residential - 70dB(A) Area - Daytime 55dB(A) Night-time • Workers to be provided with appropriate Personal Protective Equipment or Clothing [PPE/C] to include earmuffs • Respond to complaints with regard to noise generation, taking reasonable action to ameliorate the impact;	levels to staff at work or place of residence. Quarterly	Commission (Proponent)	Health & Child Care EMA

Fugitive dust	Air pollution	• Provide PPE such as dust	Amount of dust	Forestry	Ministry of

emissions & Gaseous emissions (smoke)	from fugitive dust emissions Respiratory infections risk to the workers	masks and goggles to workers during construction phases. • Smoke stack will be constructed and pollution abatement measure using scrubbers will be installed by Forestry Commission • Regular and prompt maintenance of construction machinery and equipment. This will minimize generation of suspended particulate matter. • No new access roads planned; existing access roads within the sawmilling premises and all gravel roads should be watered regularly during transportation of dried timber in order to reduce dust levels.	generated Frequency and effectiveness of dust suppression. Complaints from Employees and public on availability of PPE High vehicle speeds	Commission (Proponent) Construction and Operation	Health & Child Care NSSA EMA

		• Enclose dust generating areas where possible to mitigate effects of wind and hence controlling propagation of dust to other areas. • Limit vehicle speeds during construction e.g. 20km/hr, since the slower the vehicle speed, the less the dust generated. • Apply for a boiler stack emission licence from EMA. Scrubbers are used in the smoke stack/ chimney to absorb pollutants for emission within permissible levels according to EMA standards. • Ash is allowed to cool to avoid any fires starting and is disposed at the dumpsite since			

	Working at heights falling risk	it is not hazardous. • Fall prevention and protection measures will be implemented whenever a worker is exposed to the hazard of falling more than two meters, into operating machinery; into water or other liquid; or through an opening in a work surface. Fall prevention / protection measures may also be warranted on a case-specific basis when there are risks of falling from lesser heights. Fall prevention may include: • Proper use of ladders and scaffolds by trained employees • Use of fall prevention devices, including safety			

		belt and lanyard travel limiting devices to prevent access to fall hazard • area, or fall protection devices such as full body harnesses used in conjunction with shock absorbing lanyards or self-retracting inertial fall arrest devices attached to fixed anchor point or horizontal life-lines • Appropriate training in use, serviceability, and integrity of the necessary PPE[12]			

Increase in Traffic	Road Traffic Accidents	• Road safety signs and symbols shall be placed at appropriate	No. and frequency of accidents and trend	Forestry Commission	Ministry of Transport &

[12] WB *EHS General Guidelines*, 2007.

	Damage to roads Accelerated soil erosion	points to alert motorists on safety along the main road and other areas were appropriate • Ensure driver practice defensive driving • Identify hazards and mitigate them • Ensure that all traffic safety measures are put in place. Speed limits shall be enforced for all vehicles approaching the site	Signage Safety Stakeholders Complaints	(Proponent) Construction and Operation	Infrastructural Development, Zimbabwe Republic Police (ZRP) Lupane EMA

Surface Drainage System	Poor Surface Drainage System resulting into dampness and water stagnation	• During construction and operation, the design of the drainage system should ensure that surface flow is drained suitably to control flooding within the site.	Status of drainage Flooding incidences Quarterly	Forestry Commission (Proponent) Contractors Construction	EMA

	which can favour the breeding of disease vectors such as mosquitoes	• The drainage system should be designed concerning the peak volumes such as periods or seasons when there is high intensity of rainfall. They should never at any time be full due to the resulting heavy downpours. • Drainage system should be regularly maintained and repaired to avoid point discharge in case of breach or blockages. • The drainage channels should ensure the safe final disposal of run-off /surface water and should be self-cleaning		and operational phase	

		which means it should have a suitable gradient. • Drainage channels should also be installed in all areas that will generate or receive surface water such as car parking, driveways and along the building block-edges of the roofs. The channels should be covered with gratings or other suitable and approved materials to prevent occurrence of accidents and entry dirt that would compromise flow of run-off. • Storm water generated from roof catchments should be harvested,			

		stored and made use in various project activities such as general cleaning.			

Construction Activities	Accidents & Occupational Risks[13]	• Identify and demarcate the extent of the site and associated Works Areas as indicated on the approved Site and layout Plan using high visibility material. • Maintain site demarcations in position until the cessation of construction works; • Observe all infrastructure servitudes as per the compliance obligations, alternatively permission to be sought for any exemptions where applicable,	The number & Severity of accidents, incidents and fatalities Availability of PPE, First Aid Kit & First Aiders	Forestry Commission (Proponent) Construction and Operation	NSSA Ministry of Health and Child Care

[13] These include incidents that caused or may potentially cause significant harm to the environment, workers, communities, or natural or cultural resources.

		• Do not use the site for any other purpose other than for the proper carrying out of the project. • Do not paint or mark any natural feature. Marking for surveying and other purposes must be done using pegs and beacons. • Implementation of safety measures and emergency plans (see Annex 6) to contain accident risks associated with vehicle transport, operation of any sophisticated machinery and other related activities. All staff/contractors to be trained on general construction safety measures, basic site rules of work at / on the site and of personal protection (including use of PPE), preventing injury to fellow			

		employees and the use of machinery and equipment and safety protocols before they are allowed to use them. 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. • Workers and contractors will receive adequate training[14] and information enabling them to			

[14] The training will adequately cover: knowledge of materials, equipment, and tools; known hazards in the operations and how they are controlled; potential risks to health; precautions to prevent exposure; hygiene requirements; wearing and use of protective equipment and clothing; appropriate response to operation extremes; incidents and accidents. Training will be provided to management, supervisors, workers, and occasional visitors to areas of risks and hazards.

		understand work hazards and to protect their health from hazardous ambient factors that may be present prior to commencement of new assignments. • Workers to be provided with appropriate Personal Protective Equipment or Clothing [PPE/C]. These include safety boots, reflective work suits, helmets, goggles, earmuffs, dust masks / respirators, gloves, etc. • Provide a fully equipped first aid kit and a designated trained[15] person to administer it.			

[15] Workers with rescue and first-aid duties will receive or have dedicated training so as not to inadvertently aggravate exposures and health hazards to themselves or their coworkers. Training will include the risks of becoming infected with blood–borne pathogens through contact with bodily fluids and tissue.

		• Adequate sanitary facilities should be provided and standard cleanliness maintained. • Workers should be sensitized on social issues such as drugs, alcohol and diseases and any worksite restrictions (i.e. no smoking, hunting, etc.) during construction orientation and training sessions. • Through appropriate contract specifications and monitoring, Forestry Commission will ensure that service providers, as well as contracted and subcontracted labor, are trained adequately before assignments begin. • Report accidents, incidents and fatalities to HSBCP PIU (until the end of HSBCP), the World Bank			

		(until the end of HSBCP), relevant regulatory and other appropriate authorities in compliance with local regulations; secure the safety of workers, public, and provide immediate care. See Annex 5 • Prevent unnecessary vehicular and personnel access into adjacent undisturbed areas; • In the interests of containing environmental damage and ensuring public and wildlife safety, it may be necessary to erect temporary fencing or shade cloth around the portion under construction or maintenance; • If visitors to the site can gain access to areas where hazardous conditions or substances may be			

		present, a visitor orientation and control program should be established to ensure visitors do not enter hazard areas unescorted. Visitors should be provided with any necessary PPE. • 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. • Representatives of local emergency and security services should be invited to participate in periodic (annual) orientation tours and site inspections to ensure familiarity with potential hazards present.			

Increased Energy Demand	Increased power surge and power outages in addition to	• ZETDC will carry out the distribution reticulation within the project site. • Encourage energy conservation	Amount of energy used /	Forestry Commission (Proponent)	Ministry of Energy and Power Development

	increased energy costs.	through the following ways**:** ***Electrical appliances*** • Switch off all electrical appliances when not in use • Optimize operations of electrical equipment to enhance energy conservation ***Lighting*** • Put off all lights immediately when not in use/required or are not needed. • Use energy conserving electric bulbs for general lighting • Make use of alternative source of energy such as solar power, which is renewable. • Individual facility metering should be provided. This would encourage energy conservation. Electricity meters (Track energy	Monthly	Construction and Operation	

		consumption)			

Water demand	The proposed development may cause some strain to the existing water supply	• Project will use very little water. Forestry Commission will install a 5000m^3 water tank adequate for the operations. • Water for the boiler (and other uses) will be obtained from an already existing borehole • Encourage water reuse/recycling during operational phases. • Roof catchments should be provided with rainwater harvesting systems to enhance collection and storage of the run-off. Such water can be used in watering flower gardens and all kinds of cleaning required on site. • Provide notices and information signs on means and needs to	Quantity of water used / Monthly	Forestry Commission (Proponent) Construction and Operation	ZINWA

		conserve water resource to awaken the civic consciousness with regard to water usage and management. • Boiler water management plan to be put in place. The water requirements are mitigated by the fact that output steam is collected, cooled and recirculated back to the boilers.			
Boiler	Worker Health and Safety	• Project will adhere to National Social Security Act which mandates that boiler installation and management be approved and regularly inspected. • Workers will be given the proper PPE and be trained on how to properly operate and maintain the boiler and any related equipment.	Monitoring Indicators to be inspected	Frequency of Inspection	FC will supply PPE NSSA will monitor safety procedures

Sewage and Effluent Disposal	Sewage line Blockages Overflow of effluent into the environment	• Use and good maintenance of existing sanitary facilities. • Septic Tanks system will be used • Septic tanks shall be water tight and no spring water, subsoil water; storm water shall be permitted to enter them. • Do not locate any site toilet, sanitary convenience, septic tank to sensitive areas. • Maintain and clean site toilets regularly as is required to keep them in good, functional working order and in an acceptable state of hygiene; • Combine drinking water facilities with hand washing facilities near site toilets.	Efficient sewage system complaints from workers	Forestry Commission (Proponent) Construction and Operation	EMA
	Spread of	• Educate workers and	Number of awareness		Ministry of

	water-borne diseases	Stakeholders on hygiene and disease prevention • Septic tanks will be effectively covered and protected to minimize odor problems and to prevent the breeding of mosquitoes.	campaigns Incidence of diarrheal diseases Quarterly		Health and Child Care
Waste Generation and Disposal	Land and Water pollution	• Adhere to Waste Management Plan in Annex 11 in accordance with World Bank *General* (1.6, 4.1)[16] and *Sawmilling and Wood-based Products*[17] *Environmental, Health and Safety Guidelines* and the Zimbabwe S.I 6 of 2007. • Ensure solid waste is regularly collected for appropriate disposal.	Amount of waste generated Availability of bins Littering	Forestry Commission (Proponent) Construction and Operation	EMA

[16]World Bank Group: International Finance Corporation. *General Environmental, Health, and Safety Guidelines*, **www.ifc.org/ehsguidelines**, April 30, 2007, www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines.

[17] World Bank Group: International Finance Corporation. *Sawmilling and Manufactured Wood-based Products Environmental, Health, and Safety Guidelines*, **www.ifc.org/ehsguidelines**, April 30, 2007, www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines.

		• Provision of adequate strategically placed waste bins onsite to prevent littering. • Waste materials should be properly segregated to encourage reuse and recycling. • Excavated soil to be utilised in back filling of roads • Project to practice waste segregation, reuse at source as well as green composting to reduce the amount of waste reaching the designated dumpsite. • Where necessary, dedicate a storage area on site for the collection of waste; • Ensure that solid waste is transported properly, avoiding waste spills end-route; • Ensure that the Construction /			

		project site is kept clean, tidy and free of rubbish that would attract animal pests or cause accidents; • Biodegradable waste to be composted.			

Occupational Health and Safety	Low	• Communicate oil, fuel and other chemical hazards to workers through labeling and marking according to national and internationally recognized requirements and standards, including the International Chemical Safety Cards (ICSC), Materials Safety Data Sheets (MSDS), or equivalent. Any means of written communication should be in an easily understood language and be readily available to exposed workers and first-aid			

		personnel • PPE provided • Training workers in the use of the available information, safe work practices, emergency protocols and appropriate use of PPE during Operations • Proper and regular maintenance of equipment and machinery prevents accidents			

Fire & Security	Property Damage & Biodiversity Loss	• Provision of fire-fighting equipment during the construction and operation phases of the project • Ensure that the following are in place: · Install and maintain equipment (e.g. Fire	Installed fire safety equipment Frequency of fire incidences	Forestry Commission (Proponent) Construction and Operation	EMA

		hydrants and hose reels to be provided as part of the development). · Sensitize the workers on fire risks · Provide emergency numbers at strategic points. · Potable fire-fighting equipment to be located at strategic points. · Provision of security during the construction & operation phases. · Ensure that all workers have access to communication facilities (phones, etc.) for quick emergency response. • Take immediate steps to	Quarterly		

		extinguish any fire which may break out on the site; • Burning of excess vegetation and the use of cooking fires to be carefully controlled. • A permanent firebreak around the proposed construction site should be considered before the commencement of any construction activities. • Do not permit any smoking within the proximity of any fuel or chemical storage area. • Store flammables away from ignition sources and oxidizing materials. Further, flammables storage area should be (where possible): o Remote from entry and exit points into buildings			

		o Away from facility ventilation intakes or vents o Have natural or passive floor and ceiling level ventilation and explosion venting o Be equipped with fire extinguishing devices, and constructed of materials made to withstand flame impingement for a moderate period of time Other strategies for fire prevention include: o Providing bonding and grounding of, and between, containers and additional mechanical			

		floor level ventilation if materials are being, or could be, dispensed in the storage area o Where the flammable material is mainly comprised of dust, providing electrical grounding, spark detection, and, if needed, quenching systems o Defining and labeling fire hazards areas to warn of special rules (e.g. prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment)			

		o Providing specific worker training in handling of flammable materials, and in fire prevention or suppression.			

Operation Activities	Accidents, Incidents[18] & Occupational Risks	• Implementation of safety measures and emergency plans to contain accident risks associated with vehicle transport, operation of any sophisticated machinery and other related activities. All staff/contractors to be trained on general safety	The number & Severity of accidents, incidents and fatalities Availability of PPE, First Aid Kit & First Aiders	Forestry Commission (Proponent) Operation	NSSA Ministry of Health and Child Care

[18] Includes incidents that caused or may potentially cause significant harm to the environment, workers, communities, or natural or cultural resources.

		measures, basic site rules of work at / on the site and of personal protection (including use of PPE), preventing injury to fellow employees and the use of machinery and equipment and safety protocols before they are allowed to use them. 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. • Workers and contractors will receive adequate training[19] and information enabling them to understand work hazards and to protect their health from hazardous ambient factors that may be present prior to commencement of new assignments. • Workers to be provided with appropriate Personal Protective Equipment or Clothing [PPE/C]. These include safety boots,		Forestry Commission	

[19] The training should adequately cover: knowledge of materials, equipment, and tools; known hazards in the operations and how they are controlled; potential risks to health; precautions to prevent exposure; hygiene requirements; wearing and use of protective equipment and clothing; appropriate response to operation extremes; incidents and accidents. Training should generally be provided to management, supervisors, workers, and occasional visitors to areas of risks and hazards.

		reflective work suits, helmets, goggles, earmuffs, dust masks / respirators, gloves, etc. • Provide a fully equipped first aid kit and a designated trained[20] person to administer it. • Adequate sanitary facilities should be provided and standard cleanliness maintained. • Workers should be sensitized on social issues such as drugs, alcohol and diseases and any worksite			

[20] Workers with rescue and first-aid duties should receive dedicated training so as not to inadvertently aggravate exposures and health hazards to themselves or their coworkers. Training would include the risks of becoming infected with blood–borne pathogens through contact with bodily fluids and tissue.

		restrictions (i.e. no smoking, hunting, etc.) during orientation and training sessions. • Report accidents, incidents and fatalities to HSBCP PIU (until the end of HSBCP), the World Bank (until the end of HSBCP), relevant regulatory and other appropriate authorities in compliance with local regulations; secure the safety of workers, public, and provide immediate care. • Prevent unnecessary vehicular and personnel access into adjacent undisturbed areas;			

		• If visitors to the site can gain access to areas where hazardous conditions or substances may be present, a visitor orientation and control program should be established to ensure visitors do not enter hazard areas unescorted. Visitors should be provided with any necessary PPE. • Through appropriate contract specifications and monitoring, Forestry Commission will ensure that service providers, as well as contracted and subcontracted labor, are trained adequately before			

		assignments begin. • 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. • Rotating and Moving Equipment: o Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment should be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point. Guards			

		should be designed and installed in conformance with appropriate machine safety standards.[21] o Turning off, disconnecting, isolating, and de-energizing (Locked Out and Tagged Out) machinery with exposed or guarded moving parts, or in which energy can be stored (e.g. compressed air, electrical components) during servicing or maintenance, in conformance with a standard such as CSA			

[21] For example: CSA Z432.04 Safe Guarding of Machinery, CSA Z434 Robot Safety, ISO 11161 Safety of Machinery – Integrated Manufacturing Systems or ISO 14121 Safety of Machinery – Principals of Risk Management or equivalent ANSI standard.

		Z460 Lockout or equivalent ISO or ANSI standard o Designing and installing equipment, where feasible, to enable routine service, such as lubrication, without removal of the guarding devices or mechanisms • Extreme temperatures in permanent work environments should be avoided through implementation of engineering controls and ventilation. Where this is not possible, temperature-related stress management procedures should be			

		implemented which include: o Adjustment of work and rest periods according to temperature stress management procedures provided by American Conference of Governmental Industrial Hygienists [22], depending on the temperature and workloads o Use of protective clothing o Providing easy access to adequate hydration such as drinking			

[22] ACGIH, 2005, (ACGIH), http://www.acgih.org/TLV/.

		water or electrolyte drinks, and avoiding consumption of alcoholic beverages • Ergonomics, Repetitive Motion, Manual Handling: o Facility and workstation design with 5th to 95th percentile operational and maintenance workers in mind o 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			

		o Selecting and designing tools that reduce force requirements and holding times, and improve postures o Providing user adjustable work stations o Incorporating rest and stretch breaks into work processes, and conducting job rotation o Implementing quality control and maintenance programs that reduce unnecessary forces and exertions o Taking into consideration additional special conditions such as left handed persons			

		• Ensure that any operations manual for the kiln is readily available on site during operational phase. The operational manual may have health and safety guidelines which should be accessible to and observed by supervisors and workers. See General World Bank Environmental, Health and Safety Standards[23] for illumination and other OHS requirements.			

[23] **www.ifc.org/ehsguidelines.**

Construction activities	Employment creation & improved standard of living Competition for Employment	• Employment of locals will be prioritized during the operational phase, as construction phase Forestry Commission employees will provide the construction workforce.	% locals Employed	Forestry Commission (Proponent) Contractor Construction and Operation	District Administrator
	Broaden the rates base of the Lupane Rural District Council	• Approval of Project to construct the required Project as planned.	Approved ESMP		EMA
	Social tension due to unprecedented influx of people	• Train workers to respect cultural sensitivities of the host communities	Training Quarterly		ZRP
	Danger of	• STIs, HIV/AIDS			Ministry of Health

	escalation of STIs, HIV/AIDS	awareness and prevention program shall be put in place to guide staff conduct at the outset of the construction phase quarterly • Strengthening of healthcare system to provide voluntary counseling and testing for workers	Awareness campaign Quarterly		& Child Care

Trenching activities exposing Archaeological material	Exposure / Destruction of Archaeological material	• Chance Finding Procedures shared with Forestry Commission • In the event that archaeological material or	Chance finding procedures in place	Forest Commission (Proponent) Construction and Operation	EMA

		findings are discovered or exposed, all work stops and an archaeologist from the National Museums and Monuments of Zimbabwe should be notified so as to assess the significance of the findings and make appropriate recommendations.			

Sand Abstraction	Soil erosion	Sand for kiln foundation construction to be purchased only from sand dealers who	Monthly	Proponent (FC)	EMA,LUPANE RDC

		are registered by EMA. Inspection of sand abstraction sites will be done. Sites are to be rehabilitated using rubble or after final abstraction.			
Sand Transportation	• Soil erosion • Destruction of vegetation • Worsening of gulleys • Siltation • Air Pollution • Noise pollution.	• Only registered sand transporters should be used for sand transportation. • Maintain existing access road to prevent unnecessary cutting down of vegetation • Number of access road should be minimised	Status of access roads Quarterly	Forestry Commission (Proponent) and its Contractors	MoTID& Infrastructure Development [MoTID]

		• Proper maintenance of existing access roads • Use water to suppress dust along the roads • Stabilisation of banks e.g. using natural vegetation • Ensure that machinery is in good working condition before operations • Enforcing speed limits			
Bricks (for kiln foundation construction)	Erosion and Gully Formation	• Only EMA registered Brick makers should supply proponent with bricks.			

		• Ensure sand and brick moulding enterprises are licenced by EMA in compliance with S.I. 7 of 2007 and S.I. 3 of 2011. Quarterly checks on the sand abstraction sites will be done By EMA and/or Lupane Rural District Council			
Timber Harvesting	• Deforestation • Increased erosion due to removal of timber	• Only selected trees will be extracted as per relevant FMP • There will not be any clear cutting	• Tree cover reported • Soil (i.e. land) degradation and erosion	• FC Forester annual determination and reporting • FC Forester annual determination	FC FC

	• • Occupational Health and Safety of workers extracting timber	• No new access roads are anticipated to be constructed as there are already existing roads. • Commercial timber logging is guided by a cutting plan and there is no clear cutting to avoid creation of bare surfaces	indicators in relevant FMP Forest officers normally monitor movement of traffic and conduct surveillance checks on the existing roads to detect and control any illegal activities.	in reporting for FMP • FC, HSBCP PIU, NSSA • FC and HSBCP PIU	FC, HSBCP PIU, NSSA

		• Workers will be provided appropriate PPE	• Workers wearing and using PPE • Incidents, accidents and fatalities tracked and reported	Immediately, National Social Security Authority(NSSA)	
Final Disposition of Kiln	Solid Waste generation from the kiln itself and end of life	Follow adapted Operations Manual[24] instructions: The symbol on the bottom of the device			

[24] DELPHI Manual (English) for Kiln Dryer Control, **Revision 23, 15/02/14.**

		indicates that the electric and electronic equipment should be separated before final disposal. Do not dispose of electric and electronic equipment in mixed solid municipal waste, but dispose of to Enviro serve a registered and licenced local collector and buyer of electronic waste.			
Security	Although no communities are close to the kiln site, unauthorized people could attempt to access the site.	Site is already fenced.	The Forest protection unit of Forestry Commission provide a 24 hour security guarding to the facility. Routine inspections are conducted by the forestry		

			commission security officer who reports to the District Conservator.		

7. Environmental Monitoring Plan

The Forestry Commission (the Proponent) will undertake self-monitoring of the significant impacts identified as well as the institutions with the set mandate. This will make up the management tool through which prompt remedial action will be taken to correct unforeseen deviations in effectiveness of the mitigation measures. The Environmental Monitoring Plan for the activity is summarized in Table 7.1 below.

TABLE 7.1: Environmental Monitoring Plan

All the monitoring agents have been notified of the project during the stakeholder's consultations which will ensure project compliance. **Proponent is FC.**

Aspect / Impact Monitored	**Responsibility**	**Frequency of Sampling**	**Indicators**	**Activities**
Land degradation (Soil)	PROPONENT/ EMA	Quarterly	• Formation of gullies	• Checking gully formation onsite and along access road for kiln site during construction Forester for each Forest to annually produce: • reports • map out degraded areas • Progressive rehabilitation of any affected areas.
Land degradation	PROPONENT/ EMA	Quarterly	• Depletion of vegetative cover	• Checking for undergrowth conditions • Checking areas re-vegetated

(Vegetation)				• Checking for number of trees cut • Checking for types of trees harvested: endangered, threatened or other? • Checking for number of trees planted Forester for each Forest to annually produce: • reports • map out degraded areas • plan for corrective action
Animal Populations in Forests impacted by timber extraction	PROPONENT	Annual	• Census	• Produce census report
Forest pests and diseases	PROPONENT	Annually	• Incidences of pests and diseases • Trend over time related to this Project's timber extraction activities	• Forester for each participating forest to produce reports

Fire incidents	PROPONENT	Annually	• list causes of fires • map fire hot spots	Forester for each participating forest to produce the following as related to this Project's timber extraction activities: • reports • list causes of fires • map fire hot spots
Forest settlers	PROPONENT	Annually	Number of settlers	Forester for Gwaai to produce census reports to show population trends and analyse with respect to this Project's timber extraction activities and the requirements of the HSBCP Process Framework
Poaching trends- wildlife and timber products	PROPONENT	Annually	Number of incidences of poaching	Security officer to: - Develop a reporting template - Document incidences noting when Project activities started, how and if they impacted trends - Map out hot spots
Elephant corridor fragmentation	PROPONENT	Annually	Number of corridors fragmented	The Species selector to: -map out all animal corridors -avoid elephant corridors in areas selected for logging - Ensure safety of workers when logging.
Invasive Alien	PROPONENT	Every 2	Trends in IAS population	Forester from each forest to

Species (IAS) and bush encroachment		years		• Produce reports • Document problem species especially noting any increases that can be traced to this Project's timber extraction activities.
Forest pests and diseases	PROPONENT	Annually	Trend in incidences	Forester to produce reports showing trend in incidences
Noise Levels	Ministry of Health and Child welfare	Quarterly	• Complaints from employees and public • High noise levels generated by machines • In-availability of Ear muffs/ Buffers/ Mufflers • Construction works conducted after hours	• Conduct noise assessment on machinery and residential areas • Compare noise levels against limits • Check availability of PPE/C for employees • Check availability of signage • Check if construction works are conducted during the night.
Air Pollution	PROPONENT/ EMA/ ZRP	Quarterly	• Amount of dust generated • Frequency and effectiveness of dust	• Check nearby shops & properties whether they are being covered with a fine layer of dust • Check for number of complaints from

			suppression. • Complaints from employees and public • Availability of PPE/C • High vehicle speeds	employees and public • Check for in availability of PPE/C • Check for adherence to vehicle speed limits
Road Traffic Accidents	PROPONENT/ EMA/ ZRP	Quarterly	• Number and frequency of accidents • Signage • Safety Awareness Campaigns • Stakeholders Complaints	• Trend accidents • Check for availability of signage • Check for number of Stakeholders complaints
Surface Drainage System	PROPONENT/ EMA/Lupane RDC	Quarterly	• Status of drainages • Flooding incidences	• Blocked or damaged drainages • Frequency and extent of flooding incidences
Occupational Accidents[25] in	PROPONENT/ NSSA[26]/Minist	Monthly	• Number & Severity of accidents, incidents	• Trend the number & severity of accidents, incidents and fatalities

[25] Includes incidents that caused or may potentially cause significant harm to the environment, workers, communities, or natural or cultural resources.

Construction activities	ry of Health		and fatalities • Availability of PPE, First Aid Kit & First Aiders	• Check availability of PPE, First Aid Kit & First Aiders • Check validity of Food Handlers Certificates
Increased Energy Demand	PROPONENT / Ministry of Energy	Monthly	• Amount of energy used	• Check and trend the amount of energy used • Check implementation of energy conservation initiatives
High Water demand	PROPONENT/ ZINWA	Monthly	• Quantity of water abstracted • Quantity of water used	• Trend quantity of water abstracted • Trend quantity of water used
Sewage and Effluent Disposal	PROPONENT/ EMA	Monthly	• Efficient sewage system • Effluent Disposal Permit	• Inspect Sewage system and address issues that arise • Adhere to effluent disposal permit conditions

[26] This NSSA is a government arm responsible for safety and workmans' compensation and they make unannounced visits to check on safety compliance.

			• Effluent water quality results • Stakeholders complaints	• Conduct effluent water quality analysis
Waste Generation and Disposal	PROPONENT/ EMA	Monthly	• Amount of waste generated • Availability of bins • Littering	• Check and trend amount of waste generated • Check availability of bins • Inspect area for littering
Oils & lubricants Management	PROPONENT/ EMA	Quarterly	• Number of oil leakages from vehicles	• Check if there are any oil leakages from vehicles in the premises.
Risk of accidental fires and site security	PROPONENT / DA	Quarterly	• Installed fire safety equipment • Frequency of fire incidences	• Inspect adequacy and functionality of fire-fighting equipment and materials • Analyse fire incidences
Archaeological Material (Physical Cultural	PROPONENT / NMMZ	Chance finding procedure	• Presence of archaeological Material	• Inform NMMZ when archaeological material or findings are discovered to assess the significance of the findings and make appropriate suggestions.

Resources)				
Socio economic	PROPONENT/ DA	Quarterly	• Improved lifestyles • Stakeholders satisfaction	• Number of locals Employed • Stakeholders interviews • Check for squatters, beggars • Analyse trend of social ills such as thefts, promiscuity, drug abuse etc.
Sand Abstraction and Brick Molding	PROPONENT/ EMA	Quarterly	• Sand poaching incidences • Sites of abstraction must be rehabilitated in accordance to EMA guideline after abstraction is complete. This is one of the conditions for getting licensed by EMA.	• Penalties for Sand poaching incidences • Penalties for non-restoration of abstraction sites.

8.0 Decommissioning Plan

In the event of decommissioning, materials and other stocks will be allowed to run down. Unused substances will be returned to vendors where possible. All remaining material will be disposed of appropriately.

All equipment and machinery will be removed from the site and disposed of appropriately. All works, buildings and structures will be removed to ground level. Roads, foundations and hard standings will be removed to a level to permit adequate drainage and land reclaimed for normal plant growth. Land rehabilitation will include returning the soil conditions to its natural state and allow plants to grow.

Kiln or Equipment Decontamination Requirements:

Due to the non-toxic nature of the wood drying operation and materials used there will be no decontamination requirements.

9.0 Public Consultation and Disclosure

Stakeholders were notified of the Project by the Proponent (Forest Commission) at a full Council Meeting at the Lupane Rural District Council, with the Development Committee on the 25th of June 2019. A consultant was engaged for public consultation with key stakeholders in June 2019. In attendance were 19 committee members including the following: District Administrator, Rural District Council, Forestry Commission, Council chair, Environmental Management Agency, Chief Mabikwa, Works Chairperson, Transport/Roads among others. Questionnaires were distributed for identification of potential environmental and social impacts of the project. The feedback informed the analysis in this ESMP. The project was welcomed as a value addition and beneficiation programme with special attention to safety related issues including protective clothing for the workers. A record of the meeting proceedings will be available for public viewing in accordance with the EMA Act. The minutes of the engagement meetings and responses from selected participants demonstrate that the majority saw the proposed kiln initiative as a positive economic and social investment.

This ESMP will be available at all levels including the Forestry Commission Head Office, Provincial and on the site itself at Forest Hill in Gwaai to facilitate for training and familiarisation with the impact monitoring mechanisms proposed and put in place. It will also be publicly disclosed on the Forestry Commission website under the HSBCP.

The Grievance Redress Mechanism (GRM), Annex 8 provides defined stepwise reporting mechanisms for the employees and the necessary feedback mechanisms. Any other grievance outside the employees can be reported through the project GRM (Annex 9) mindful that the public can also make use of the FC grievance procedure during and after project closure scheduled for the 31st of December 2019.

Forestry Commission Management will ensure this ESMP is communicated to project employees and relevant Interested Parties during operation.

10. Project Implementing Arrangements

The project will rely on the existing staff employed at the Forest Hill sawmill. Ten people will be needed to operate the kiln. The District Forest Officer for Gwaai Forest and the Saw Mill Supervisor will directly supervise three kiln operators and five timber measurers. A trained designated Health and Safety Officer will be on site at all times during construction and kiln operations to provide care as needed and ensure proper protocols are followed during an emergency. The Forest Officer will report to the District Conservator of Forests who will be responsible for implementing, monitoring and reporting as is specified in the ESMP. FC staff or contractors for identifying and cutting the selected trees are elaborated in the Gwaai Forest Management Plan (Annex 4) also known as the Gwaai Profile.

11. Budgetary Arrangements

Forestry Commission is responsible for the provision of all personal protective clothing and tools for the employees through their organisation's

budget. In addition, other funds needed for implementation of this ESMP are and will be covered by the Forestry Commission. Such activities include the construction of a 300m^2 slab where the kiln and the timber shed will be installed, construction of a smoke stack and scrubbers for pollution control and payment of the emission as well as the EMP licences as prescribed in the EMA Act.

Table 11.1 summarises the key activities to be funded from the Forestry Commission budget

Activity	Requirements	Budget(USD)
1.Slab construction	Cement, concrete, pit and river sand	3 500
2.Smoke stack/ Chimney	Fire brick, scrubbers	2 500
3.Protective Clothing	Safety shoes, works suits, hard hats	1 000
4. Safety Signage at the factory site	Signage material	500
5.Air emission license	An air emission license issued by EMA is required	250
6.EMP certificate	An EMP certificate issued by EMA	250

12. Institutional and Reporting Arrangements

The Forestry Commission Management will implement this Environment and Social Management Plan in order to minimize the extent of the project environmental footprint as much as is possible and avoid or manage negative impacts. Cutting plans are used to monitor and control harvesting and monitor off take. On a monthly basis, progress reports are produced for

management consideration, analysis and interventions where necessary. The respective District Conservators and foresters will carry out the necessary monitoring and reporting from on-the-ground activities. They report to The Chief Conservator of Forests who is based in Bulawayo on ESMP progress and fulfill all reporting requirements to national and international bodies as listed in the ESMP Mitigation Table 6.1 and Monitoring tables (Table 7.1).

The HSBCP PIU will provide oversight and guidance as well as report on kiln activity until it's (the PIU's) end.

Other government entities such as EMA, the National Social Security Authority (NSSA), the Ministry of Health, etc. will conduct routine inspections and monitor the activity as per their mandates (indicated in the Environmental and Social Management Mitigation Plan (Table 6.1) and Monitoring plan (Table 7.1) during project implementation.

The National Social Safety Authority (NSSA) is a government arm responsible for safety and workmans' compensation and they make unannounced monitoring visits to check on safety compliance by FC.

Annex 1: Site Screening Checklist

When considering the location of a subproject, rate the sensitivity of the proposed site in the following table according to the given criteria.

Higher ratings do not necessarily mean that a site is unsuitable. They do indicate a real risk of causing undesirable adverse environmental and social effects, and that more substantial environmental and/or social planning may be required to adequately avoid, mitigate or manage potential effects.

Issues	Site Sensitivity			Rating	Comments
	Low	Medium	High		
Natural habitats	No natural habitats present of any kind	No critical natural habitats[27]; other natural habitats occur	Critical natural habitats present	High	The site already has existing sawmill structure running, the kiln purchased will only be used to mechanically dry the sewn timber to increase the market value of the timber and will be sited next to the sawmill which is an already disturbed, though protected, area. The rating is high because the proposed kiln site is located in Gwaai Forest Reserve which

[27] Critical natural habitats include both legally designated and undesignated parks, forests, etc as defined in the World Bank Operational Policy 4.04; Natural Habitats.

Issues	Site Sensitivity			Rating	Comments
	Low	Medium	High		
					is a protected Forest. In addition, the wood will be sourced from Gwaai Forest itself.
Water quality and water resource availability and use	Water flows exceed any existing demand; low intensity of water use; potential water use conflicts expected to be low; no potential water quality issues	Medium intensity of water use; multiple water users; water quality issues are important	Intensive water use; multiple water users; potential for conflicts is high; water quality issues are important	Low	A 10 000-litre tank will be mounted on a four-meter stand. Low water usage for the boiler since it is a self-contained system. (Steam from the boiler is cooled and fed back into the system).
Natural hazards vulnerability, floods, soil stability/ erosion	Flat terrain; no potential stability/erosion problems; no known volcanic/seismic/ flood risks	Medium slopes; some erosion potential; medium risks from volcanic/seismic/ flood/ hurricanes	Mountainous terrain; steep slopes; unstable soils; high erosion potential; volcanic, seismic or flood risks	Low	Relatively flat area, slope averaging 0 to 1 degree.
Cultural property	No known or suspected cultural heritage sites	Suspected cultural heritage sites; known heritage sites in broader area of influence	Known heritage sites in project area	Low	No known historical or archeological features within proximity

Issues	Site Sensitivity			Rating	Comments
	Low	Medium	High		
Involuntary resettlement	Low population density; dispersed population; legal tenure is well-defined; well-defined water rights	Medium population density; mixed ownership and land tenure; well-defined water rights	High population density; major towns and villages; low-income families and/or illegal ownership of land; communal properties; unclear water rights	Low	This is an already established site with on-going sawmill operations. Situated in a forest where there are no settlements.
Indigenous peoples	No indigenous population	Dispersed and mixed indigenous populations; highly acculturated indigenous populations	Indigenous territories, reserves and/or lands; vulnerable indigenous populations	Low	Not applicable

Annex 2: Environmental and Social Checklist

		Yes	No	Comment
A	**Type of activity – Will the subproject:**			
1	Involve the construction or rehabilitation of any medium to		x	

		Yes	No	Comment
	large dams, weirs or reservoirs?			
2	Support rural water supply and sanitation schemes?		x	
3	Build or rehabilitate any rural roads?		x	
4	Involve solid waste management?		x	
5	Involve community forestry?		x	
6	Involve small-scale aquaculture?		x	
7	Involve community healthcare facilities and the management of healthcare waste?		x	
8	Build or rehabilitate any structures or buildings?	x		Building of a concrete slab to harbour the kiln.
9	Support agricultural activities? *If the subproject may lead to an increase in the use of pesticides or require the purchase of pesticides, further environmental analysis is required to determine the extent and if an ESMP or Pest Management Plan would be necessary in accordance with the World Bank 4.09 Pest Management Policy.*		x	
10	Be located in or near an area where there is an important historical, archaeological or cultural heritage site (such as burial or ceremonial) or known artefacts such as fossils?		x	
11	Involve excavation (such as for watering points) or gully management/stabilization.		x	

		Yes	No	Comment
	If the answer to questions 10 and/or 11 is yes, then any civil works contract must include chance-find procedures, the National Museums and Monuments of Zimbabwe and/or relevant community/communities must be consulted and/or sensitized as appropriate. Also further analysis and formulation of an ESMP is warranted to assess and determine if any further mitigation will be required.			
12	Be located within or adjacent to any critical natural habitats (i.e. areas that are or may be protected by government such as a national park, forest, national reserve, world heritage site or local tradition), or that might be a natural habitat? Such subproject activities require further analysis and formulation of ESMP to include consultation with relevant protected area authorities and consistency with protected area or forest management plans.	Yes		The plant will be situated on a site with an already existing sawmill structure in a state gazetted forest, a natural habitat. Wood to be dried in the kiln will be taken from the Gwaai Forest.
13	Depend on water supply from an existing dam, weir or other water diversion structure?		*x*	
	If the answer to any of questions 1-16 is "Yes", consult the ESMF for guidance on how to avoid or minimize typical impacts and risks			
B	**Environment – Will the subproject:**			
14	Risk causing the contamination of drinking water?		x	
15	Cause poor water drainage and increase the risk of water-related diseases such as malaria or bilharzia?		x	
16	Harvest or exploit a significant amount of natural resources such as trees, fuel wood or water?	X		Timber will be harvested from Gwaai Forest itself and transported to this site for drying in the kiln as well as for fuel for the kiln.
1	Be located within or nearby environmentally sensitive areas	X		

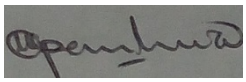
		Yes	No	Comment
7	(e.g. intact natural forests, parks, wetlands) or threatened/endangered species?			
18	Create or contribute to a risk of increased soil degradation or erosion?	X		The cutting plan is the control measure used to avoid clear cutting which increases the risk of bare ground.
19	Create a risk of increasing soil salinity?		x	
20	Produce, or increase the production of, solid or liquid wastes (e.g. water, medical, domestic or construction wastes)?	X		Construction waste will be produced short term during construction. Timber offcuts from the sawmill, and not the wood drying in the kiln, will be used to fire the boiler. No wood waste is produced from the kiln.
21	Affect the quantity or quality of surface waters (e.g. rivers, streams, wetlands), or groundwater (e.g. wells)?		x	
22	Result in the production of solid or liquid waste, or result in an increase in waste production, during construction or operation?	x		Increased solid waste from the sawmill due to increased production but all the off cuts waste will be used to fire the boiler
	If the answer to any of questions 14-22 is "Yes", please include an ENVIRONMENT AND SOCIAL MANAGEMENT PLAN (ESMP) with the subproject application.			

		Yes	No	Comment
C	**Land and access to resources – Will the subproject:**			
23	Require changes in current land use (public or private, temporarily or permanently)?		x	
24	Use land that is currently occupied or regularly used for productive purposes (e.g. gardening, farming, pasture, fishing locations, forests)		x	
25	Require movement individuals, families, farm production, businesses or other basis for livelihood?		x	
26	Result in the temporary or permanent loss of crops, fruit trees or household infrastructure such as granaries, outside toilets and kitchens?		x	
27	Result in the involuntary restriction of access by people to legally designated parks and protected areas?		x	
	It the answer to any of the questions 23-27 is "Yes", please consult the ESMF and PF, seek guidance from the World Bank team and, if needed, prepare a Resettlement Action Plan (RAP)			
D	**Indigenous people – Are there:**			
28	Any indigenous groups living within the boundaries of, or nearby, the project?		x	
29	Members of these indigenous groups in the area who could benefit from the project?		x	
	If the answer to questions 28 or 29 is "Yes", please consult the ESMF, seek guidance from the World bank team and, if needed, prepare an Indigenous Peoples Plan (IPP).			
E	**Pesticides and agricultural chemicals – Will the subproject:**			
30	Involve the use of pesticides or other agricultural chemicals, or increase existing use?		x	

		Yes	No	Comment
	If the answer to question 30 is "Yes", consult the World Bank project team and, if needed, prepare a Pest Management Plan (PMP).			
F	**Dam safety – Will the subproject:**			
31	Involve the construction of a dam or weir?		x	
32	Depend on water supplied from an existing dam or weir?		x	
	If the answer to question 31 or 32 is "Yes", please consult the ESMF and, if needed, prepare a Dam Safety Report (DSR) or other appropriate instrument.			
G	*Occupational Health and Safety*-- Will the subproject require:			
33	The hiring of workers for civil works?		x	
34	Require the establishment of a labor camp for workers especially those from outside the community?		x	
	If the answer to question 33 and/or 34 is "Yes", please consult the World Bank Environmental, Health and Safety Standards for guidance on conditions for worker health and safety expected. For the ESMP or follow-up on these issues, OHS clauses must be part of contracts with third parties carrying out civil works. "Yes" to question 34 requires.			

CERTIFICATION

We certify that we have thoroughly examined all the potential adverse effects of this subproject. To the best of our knowledge, the subproject plan as described in the application and associated planning reports (e.g. ESMP, RAP, ARAP, etc.), if any, will be adequate to avoid or minimize all adverse environmental and social impacts.

Community representative (signature):  Godrich Mupanhwa Acting Operations Manager

Extension team representative (signature):  Stephen Zingwena Conservation and Extension (CONEX)

Date: June 2019

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Desk Appraisal by Review Authority:

☐ **The subproject can be considered for approval.** The application is complete, all significant environmental and social issues are resolved, and no further subproject planning is required.

✓ **A field appraisal is required.**

Note: A field appraisal must be carried out if the subproject:

- ***Needs to acquire land, or an individual or community's access to land or available resources is restricted or lost, or any individual or family is displaced***
- ***May restrict the use of resources in a park, forest or other protected area by people living inside or outside of it***
- ***May affect a protected area or a critical natural habitat***
- ***May encroach onto an important natural habitat, or have an impact on ecologically sensitive ecosystems (e.g. rivers, streams, wetlands)***
- ***May adversely affect or benefit an indigenous people***
- ***Involves or introduces the use of pesticides***
- ***Involves, or results in: a) diversion or use of surface waters; b) construction or rehabilitation of latrines, septic or sewage systems; c) production of waste (e.g. construction waste); d) new or rebuilt irrigation or drainage systems; or e) small dams, weirs, reservoirs or water points.***

The following issues need to be clarified at the subproject site:

……

……

A Field Appraisal report will be completed and added to the subproject file.

Name of desk appraisal officer (print): ____Goldrich Mupanhwa_____

Annex 3: Field Appraisal Form

Part 1: Identification

1. **Project Name:** Gwaai kiln drying hardwood project

2. **Project Location:** Forest Hill, Gwaai forest, Lupane District

3. **Reason for Field Appraisal:** Issues from the ESMF Checklist that determined the need for a Field Appraisal are; ***impacts of the kiln construction to the ecosystem integrity and human well-being.***

4. **Date(s) of Field Appraisal: July 2019**

5. **Field Appraisal Officer and Address: Dube Butholezwe (ESMP kiln consultant)**

6. **Extension Team Representative and Address: See attached document on minutes of the kiln consultations**

7. Community Representative and Address:

See attached minutes of the kiln consultation.

Part 2: Description of the Project

8. Project Details: Provide details that are not adequately presented in the subproject application. If needed to clarify subproject details, attach sketches of the subproject component(s) in relation to the community and to existing facilities

See attached minutes for the kiln consultation

Part 3: Environmental and Social Issues

9. Will the project:

	Yes	**No**
• Need to acquire land?		x
• Affect an individual or the community's access to land or available resources?		x
• Displace or result in the involuntary resettlement of an individual or family?		x

If "Yes", tick one of the following boxes:

- ❑ The Resettlement Action Plan (RAP) included in the subproject application is adequate. No further action required.
- ❑ The RAP included in the subproject application must be improved before the application can be considered further.
- ❑ A RAP must be prepared and approved before the application can be considered further.

10. Will the project:

Yes	**No**

• Encroach onto an important natural habitat?	x
• Negatively affect ecologically sensitive ecosystems?	x

If "Yes", tick one of the following boxes:

- ❑ The ENVIRONMENT AND SOCIAL MANAGEMENT PLAN (ESMP) included in the subproject application is adequate. No further action required.
- ❑ The ESMP included in the subproject application must be improved before the application can be considered further.
- ❑ An ESMP must be prepared and approved before the application can be considered further.

11. Are there indigenous people living in the subproject area who could benefit from, or be adversely affected by, the subproject?	**Yes**	**No**
		x

If "Yes", tick one of the following boxes:

- ❑ The Indigenous Peoples Plan (IPP) included in the subproject application is adequate. No further action required.
- ❑ The IPP included in the subproject application must be improved before the application can be considered further.
- ❑ An IPP must be prepared and approved before the application can be considered further.

12. Will this project involve or introduce pesticides?	**Yes**	**No**
		x

If "Yes", tick one of the following boxes:

- ❑ The Pest Management Plan (PMP) included in the subproject application is adequate. No further action is required.
- ❑ The PMP included in the subproject application must be improved before the application can be considered further.
- ❑ A PMP must be prepared and approved before the application can be considered further.

13. Will this project involve or result in:

Yes	No
	x
	x
	x
	x

- Diversion or use of surface waters?
- Construction and/or rehabilitation of latrines, septic or sewage systems?
- Production of waste (e.g. slaughterhouse waste, medical waste, etc.)?
- New or rebuilt irrigation or drainage systems?

If "Yes", tick one of the following boxes:

The application describes suitable measures for managing the potential adverse environmental effects of these activities. No further action required.

✓ The application does not describe suitable measures for managing the potential adverse environmental effects of these activities. An ENVIRONMENT AND SOCIAL MANAGEMENT PLAN has been prepared pending approval before the application is considered further.

14. Will this project require the construction of a small dam or weir?

Yes	No
	x

If "Yes", tick one of the following boxes:

❑ The application demonstrates that the structure(s) will be designed by qualified engineers, and will be built by qualified and adequately supervised contractors. No further action is required.

❑ The application does not demonstrate that the structure(s) will be designed by qualified engineers, and will be built by qualified and adequately supervised contractors. The application needs to be amended before it can be considered further.

15. Will this project rely on water supplied from an existing dam or weir?

Yes	No
	x

If "Yes", tick one of the following boxes:

❑ The application demonstrates that a dam safety report has been prepared, the dam is safe, and no remedial work is required. No further action is required.

- ❑ The application does not demonstrate that a dam safety report has been prepared, the dam is safe, and no remedial work is required. A dam safety report must be prepared and approved before the application is considered further.

16. Are there any other environmental or social issues that have not been adequately addressed?

Yes	No
	x

If "Yes", summarize them: _____

_____

_____

and tick one of the following boxes:

- ❑ Before it is considered further, the application needs to be amended to include suitable measures for addressing these environmental or social issues.
- ❑ An ENVIRONMENT AND SOCIAL MANAGEMENT PLAN needs to be prepared and approved before the application is considered further.

Part 4: Field Appraisal Decision

- ❑ **The subproject can be considered for approval.**

  Based on a site visit and consultations with both interested and affected parties, the field appraisal determined that the community and its proposed project adequately address environmental and/or social issues as required by the Project's ESMF.

- ✓ **Further subproject preparation work is required before the application can be considered further.**

  The field appraisal has identified environmental and/or social issues that have not been adequately addressed. The following work needs to be undertaken before further consideration of the application:

  An ESMP must be developed to assess and articulate a management strategy for identified impacts._____

All required documentation such as an amended application, ESMP, RAP, IPDP or PMP will be added to the subproject file before the subproject is considered further.

Name of field appraisal officer (print):.BUTHOLEZWE. DUBE…….

Signature:  …….. Date: June 2019……..

Annex 4: Gwaai Forestland Zimbabwe Profile of the Demarcated/Gazzeted Area

Ministry of Environment, Water and Climate

FORESTRY COMMISSION

GWAAI FORESTLAND ZIMBABWE
PROFILE OF THE DEMARCATED/GAZZETED AREA

COMPILED BY MSHONIWA SHONIWA

DOCUMENTED AS AT 01/01/2019

PREFACE

The demarcated forest of Gwaai is managed by Forestry Commission of Zimbabwe through the Conservation and Extension division of the Government's organisation. This is to effectively achieve the division's goals and objectives through the enhancement of scientific tools and procedures used to implement forest operations in the Forest Reserve thereby

creating a coordinated framework which ensures that the mission of the organisation is accomplished. It encompasses the catchment conservation of this fragile Kalahari forest, the conservation of the diverse flora and fauna biodiversity of the forest, and sustainable utilisation of the forest's resources thereby ensuring continuity of the social and economic aspects offered by this forest.

Forestry Commission is the forestry authority whose mandate is derived from the Forest Act Chapter 19:05 and the Communal Land Forest Produce Act Chapter 19:04. It is responsible for regulating the forestry sector, offering forestry extension services, management of the gazetted forests for biodiversity conservation, capacity building through forestry research and training.

This Management Plan is for Gwaai forest, one of the forests under the management of Forestry Commission.

M. Shoniwa
Forester in Charge Gwaai Forest – Forestry Commission Zimbabwe

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ACRONYMS

APO	ANNUAL Plan of Operation
Dbh	Diameter at breast height (1.3m)
FMP	Forest management plan
FMU	Forest management unit
FSC	Forest stewardship council
IAS	Invasive alien species
M & I	Mapping and Inventory

IPZ	Intensive Protection Zone
NTFP	Non Timber Forest Products
PA	Protected Area
PPE	Personal Protective Equipment
PSP	Permanent Sample Plot
RNTC	Rhodesia Native Timber Company
RTE &V	Rare, threatened, endangered and vulnerable
SOP	Standard Operating Procedures

Acknowledgements

The author would not have successfully compiled this document in his own accord. This profile has been made possible by the data collected by the forester and his field staff, editing assisted by The Chief Conservator of Forests, Forest and Wildlife Ecologist, and The District Conservator - Lupane. The Forestry Commission's department of the Mapping and Inventory (M&I) was crucial in providing forestry inventory data, geographical information and the necessary various maps. Lastly appreciation is given to all those not mentioned by name. May all the above mentioned continue to assist in the continuous improvement of documenting the profile of Gwaai forest. Thank you all.

GAZZETED FOREST PROFILE APROVAL DECISION

Forest Management Unit (FMU) - Gwaai Forestland

The Forest Profile for Gwaai Forestland dated 1st January 2019 is hereby approved subject to satisfactory compliance as at the time of documentation. Forest dynamics and resource utilisation can however alter this profile whereby a review of the profile can be done.

Effective date 01/01/2019

Approved by: A. Tembo
Chief Conservator of Forests – Matabeleland North, Zimbabwe

1. HISTORY AND BACKGROUND

Gwaai forest was gazetted in 1930. In 1923 Gwaai forest together with Ngamo forest and Bembesi forest were identified for protection as demarcated forest through the Land Apportionment Act (L.A.A) of 1930 as part of the Gwaai group of forests. The area of extent excluded blocks H and J which were later added through the third schedule of the amended L.A.A of 1941. At the time of proclamation there were forest residents already living inside the forest who were recognised through the forest African tenant policy. During the time of proclamation, wildlife management was not considered as a major activity by Forestry Commission and as such focus was on the production of lumber timber from three commercial timber species, *Pterocarpus angolensis*, *Baikeaea plurijuga* and *Guibourtia coleosperma*.

In the 1920s exploitation of timber in Gwaai forest was commenced by a state company called the Rhodesia Native Timber Company (R.N.T.C). Large portions of teak were harvested haphazardly. In 1939, an enumeration survey was carried out for the main commercial tree species with the objective of opening up a lumber operation. In 1970 the same company harvested timber in block O of Gwaai forest. During this period there was huge demand for teak which was being used for railway sleepers and mine stumps. After the 1970s the demand increased to include Mukwa which is favourable in furniture manufacturing due to its workable timber. Between 1992 and 1994 an operation which later became economically full scale was initiated for salvage harvesting dying Mukwa. During that time the minimum harvesting sizes of trees were set at 35cm diameter at breast height (d.b.h).

2. MANAGEMENT OBJECTIVES.

The major forest management objectives as set out in the 1961 Forest Policy were summarised as follows-

1. To manage demarcated forests to produce exploitable timber of the main commercial species on a sustained yield basis.
2. To increase the productivity of forests by developing schemes to utilise minor forest produce and by implementing principles of multiple land use where feasible
3. To develop proper understanding of ecological significance of forests in wildlife management.

4. To protect the catchment areas for rivers that drain into the Zambezi and to protect the fragile Kalahari sand formations
5. To develop the amenity value of forests.

3. LOCATION AND SIZE

An area of 144 300 hectares in extent makes Gwaai Forest the largest of all demarcated forests in Zimbabwe. It is situated in Lupane District. The headquarters (Forest Hills) is situated aproximatley140km North West of Bulawayo and 30km South East of Lupane (the Provincial administrative capital of Matabeleland North Province). The forest is bordered by Bembesi forest and Umzibane forest in the East, Gwaai River and Tsholotsho communal area in the South, Gwaai purchase farms and Bembesi River in the West and North West, and Lupane communal land in the North. The forest shares boundaries with two administrative Districts of Lupane and Tsholotsho. Location is as shown in figure 1 below.

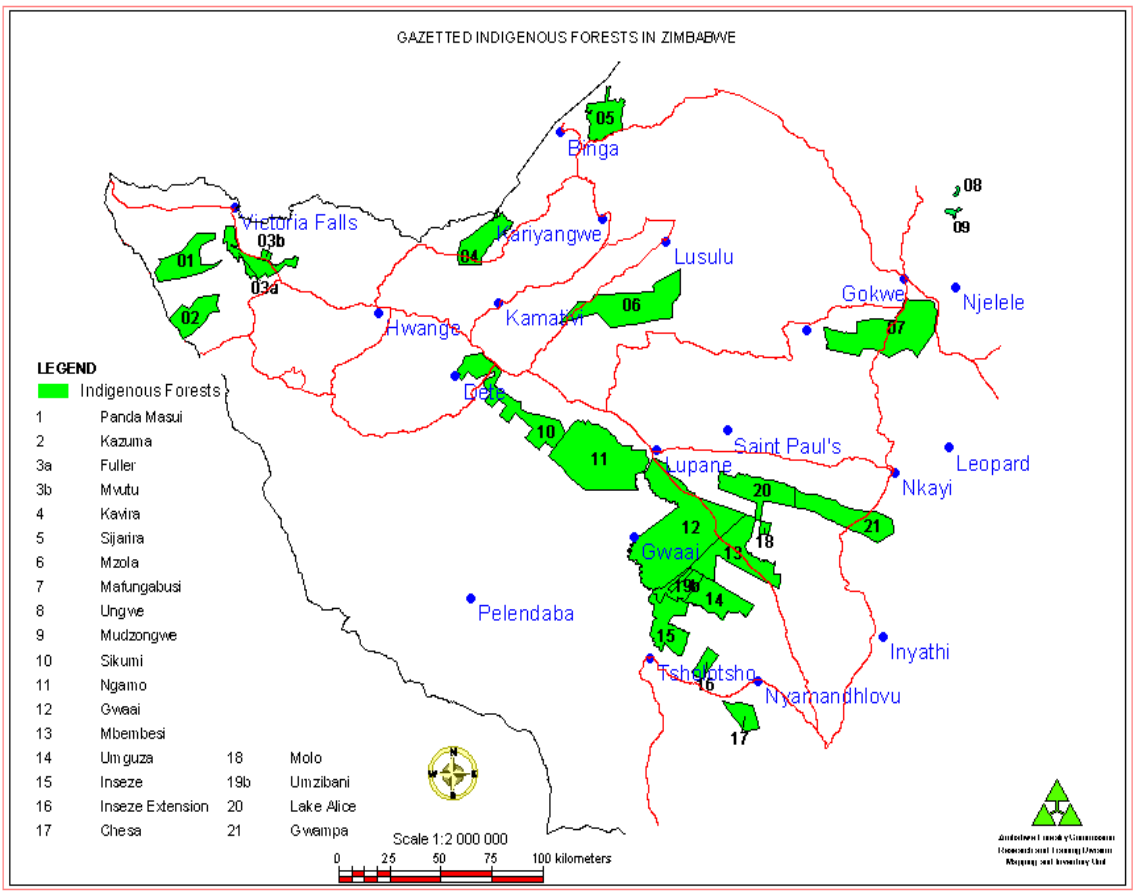

Figure1. Location of Gwaai Forest in Zimbabwe (Labelled 12): Source: Forestry Commission mapping and inventory unit

4. PHYSIOGRAPHY

4.1 Morphology

The forest falls under Zimbabwe's agro-ecological region IV which is an arid savannah environment. Area is generally flat with occasional small to medium sized depressions which form natural water pans during the rainy season. Altitude ranges between 3 300m and 3 650m above sea level.

4.2 Soils

The soils are mostly composed of thick layers of Kalahari sands. These are of Aeolian origin and are thought to have blown from the Kalahari Desert. The Mvana and Insuza vleis are characterised by some underlying basalt rocks. These calcrete plains and vleis are thus comprised of dark soils and sometimes cracking clay. There are some pockets of sandy clay loams found along the Gwaai and Bembesi Rivers.

4.3 Drainage

The Gwaai, Bembesi and Insuza Rivers form the main drainage systems in Gwaai forest. The rivers are mainly seasonal with a short flowing period between January and March.
Part of the Bubi-Lupane dam is also located in Gwaai Forest. The Forest has four artificially pumped water points situated at natural pans namely Dhlawa, Mabhikwa, Number One and Oil well.

4.4 Climate

Gwaai forest is located in an arid and hot area. Rainfall comes in a short variable season mainly between October and February. It usually ranges between 400mm and 600mm per annum. Frequent and prolonged droughts are common. During the 1991/92 drought, rainfall received was under 150 mm/year. The rainfall pattern has of late become erratic. Mean annual temperatures range between 18^0C and 28^0C. Daily maximum temperatures have however been known to reach above 40^0C and minimum temperatures below 6^0C. Recent years have seen very cold nights being experienced in winter characterized by frost.

4.5 Environmental limitations

The dry conditions of the area is also a problem as game water becomes scarce during the dry periods, thus need to pump underground water reserves. Bush encroachment on vleis is another threat to the integrity of the forest through invasive species. Wild veld fires are also a cause for concern. Climate change especially the summer heat waves create fire protection challenges as the fire danger index reaches its peak in the region thus despite pre-suppression measures threat from the forest neighbours is eminent. The sandy terrain makes accessibility a challenge as most roads require 4x4 trucks making it hard to carry out fundamental forest operations.

5. ROAD NETWORKS

Name	Road Category	Distance
Eastern boundary	Forest boundary and external fireguard	44km
Salt Lick	Fire line	34km
Power line	Fire line	22.5km

Name	Road Category	Distance
Gum line	Fire line	3km
Mpofu line	Fire line	6.25km
Steyrn line	Fire line	3km
Centre line	Fire line	47.5km
Masheke line	Fire line	39.5km
Old RNTC railway line	Fire line	27.5km
Western boundary/Somgolo road	Forest boundary, State road and external guard	33km
Kofan line	Fire line	6km
Bulawayo/Vic falls road	State road	50km
Bulawayo/Vic falls strip road	State road	54km
Kale line	Fire line	20km
O riley line	Fire line	22.5km
8 Mile line	Fire line	25km
10 Mile line	Fire line	17.5km
Northern bodaboda	Fire line	28km
Southern bodaboda	Fire line	29.5km
16 Mile line	Fire line	22km
18 Mile line	Fire line	25km
Nkabeta line	Fire line	12.5km
Mapilibomvu line	Fire line	15km
Main line extension	Fire line	12.5km
204 line	Fire line	12km
Corner line	Fire line	6.5km
Gwaai river Bodaboda line	Fire line	27km
Bush mill line	Fire line	7km
No 1 line	Fire line	12km
No 2 line	Fire line	9km
No 3 line	Fire line	11km
Block J extraction line	Fire line	11km
No 4 line	Fire line	9km
Bembesi river bodaboda	Fire line	32km

6. INSTITUTIONAL COORDINATION

Department	Department Head
Local Government	District Administrator, and Assistant District Administrator
“ “ “	Kusile Rural District Council-CEO and Campfire Officer
“ “ “	Council chair and Vice, Councillor ward 28
“ “ “	Local leadership-Chief Mabhikwa and Village and Kraal heads
Agritex	District Agricultural extension Officer
Veterinary services	Government Veterinary Officer
ZRP	Officer in Charge
EMA	District environmental Officer
President’s Office	District Intelligence Officer
Information and Publicity	Provincial Information Officer

7. PROFILE OF ADJACENT LANDS

The forest forms boundaries with Bembesi forest and Umzibane forest in the East, Tsholotsho communal area in the South, Gwaai purchase farms in the West and North West, and Lupane communal land in the North. This makes the forest to be surrounded by lands with similar objectives Bembesi and Umzibane in some portions, leaving the land use plans of the remaining forest neighbours, Gwaai purchase area, Tsholotsho and Lupane communal areas divergent to the forest's objectives.

8. LAND USE AND OWNERSHIP STATUS

Gwaai forest is a demarcated forest owned by the Government of Zimbabwe through Forestry Commission which is a scientific, management and regulatory authority in the country under the Ministry of Environment, Tourism and Hospitality Industry. Forestry Commission derives its mandate from the Forest Act chapter 19.05 which empowers it to be the local authority superintending over the forest reserve. However neighbouring communities and forest residents have access and user rights to forest services and products found in Gwaai Forest. There is provision to allow formal use of the forest for cultural activities and ritual activities through the continuous community engagement initiative. This takes into account that these had been in existence before the inception of forest reserves.

9. DESCRIPTION OF FOREST RESOURCES AVAILABLE IN GWAAI FOREST

The forest is subdivided into management zones namely Block A to Block O based on the occurrence of resources and management activities suitable for each ecotype. Notable zones set aside include hunting blocks, lumber blocks, thatch grass collection areas and the settlement areas. Resources found in Gwaai forest are summarised below-

9.1 Vegetation

The vegetation types found Gwaai forest are ecological units based on dorminant species composition of the woody layer. The forest cover types are described below and summarised in Fig 2.

9.1.1 Baikiaea woodland

Baikiaea plurijuga is the major species found in this woodland type. Other associated species include *Pterocarpus angolensis*, *Guibourtia coleosperma*, *Afzelia quanzensis*, *Schinziophyton rautanenii*, *Burkea africana*, *Terminalia* spp and *Combretum* spp (Rogers, 1993). This type of woodland contains most of the commercially exploitable indigenous timber species. The expected average productivity is set at 200m^3 per month amounting to 4 800m^3 per annum. The mean annual increment of these species is estimated at 0.6 to 0.7m^3/ha (Chihambakwe, 1987).

An inventory done in 1994 showed the following timber was available in all blocks (Block A to Block O) of Gwaai forest and is shown in Table 1 below.

TABLE1. COMMERCIAL SPECIES INVENTORY IN GWAAI FOREST-1994

BLOCK	PRODUCTIVE AREA (ha)	SPECIES	CLASS 1 (m^3 o/b)	CLASS 2 (m^3 o/b)	CLASS 3 (m^3 o/b)	TOTAL (m^3 o/b)
A-O	204 300	*Pterocapus angolensis*	63 626	23 568	1 862	89 056
		Baikiaea plurijuga	198 657	94 986	24 012	317 655
		Guibortia coleosperma	77 491	31 680	8 229	117 400
TOTAL	**204 300**	**All commercial species**	**339 774**	**150 234**	**34 103**	**524 111**

The timber in all the blocks have been exhausted accept for Blocks A, B, L, M and N. These are situated in the hunting zone and the area constitutes 21% of the timber productive area. Their inventories as at 1994 were as follows and are shown in table 2 below.

TABLE2. COMMERCIAL SPECIES INVENTORY IN BLOCKS (A, B, L, M, N) GWAAI FOREST-1994

BLOCK	PRODUCTIVE AREA (ha)	SPECIES	CLASS 1 (m^3 o/b)	CLASS 2 (m^3 o/b)	CLASS 3 (m^3 o/b)	TOTAL (m^3 o/b)
MUKWA						
A	8 382	*Pterocapus angolensis*	4 735	1 703	94	6 532
B	5 830	*Pterocapus angolensis*	8 493	2 664	107	11 264
L	11 183	*Pterocapus angolensis*	8 096	5 015	523	13 634
M	8 699	*Pterocapus angolensis*	1 551	436	46	2 033
N	9 201	*Pterocapus angolensis*	3 861	716	49	4 626
TOTAL	**43 295**	***Pterocapus angolensis***	**26 736**	**10 534**	**819**	**38 089**
TEAK						
A	8 382	*Baikiaea plurijuga*	11 948	4 025	901	16 874
B	5 830	*Baikiaea plurijuga*	12 922	3 419	1 050	17 391
L	11 183	*Baikiaea plurijuga*	18 112	10 441	2 109	30 662
M	8 699	*Baikiaea plurijuga*	15 579	11 310	2 387	29 276
N	9 201	*Baikiaea plurijuga*	15 164	9 794	2 983	27 941
TOTAL	**43 295**	***Baikiaea plurijuga***	**73 725**	**38 989**	**9 430**	**122 144**
ROSEWOOD						
A	8 382	*Guibortia coleosperma*	6 829	1 108	207	8 144
B	5 830	*Guibortia coleosperma*	5 609	1 137	257	7 003
L	11 183	*Guibortia coleosperma*	12 340	7 355	2 220	21 915
M	8 699	*Guibortia coleosperma*	3 900	2 848	629	7 377
N	9 201	*Guibortia coleosperma*	1 266	733	178	2 177
TOTAL	**43 295**	***Guibortia coleosperma***	**29 944**	**13 181**	**3 491**	**46 616**
ALL SPECIES						
A, B, L , M AND N	43 295	*Pterocapus angolensis*	26 736	10 534	819	38 089
		Baikiaea plurijuga	73 725	38 989	9 430	122 144
		Guibortia coleosperma	29 944	13 181	3 491	46 616
TOTAL	**43 295**	**All commercial species**	**130 405**	**62 704**	**13 740**	**206 849**

Consistent fires in Block N and parts of M, rampant poaching of Mukwa in Blocks A and B which resulted in salvage harvesting of Mukwa in Block B coupled with elephant damage in all the Blocks in the table above means volumes are now way below these projected figures.

9.1.2 Miombo woodland

The major species in this type of woodland are *Brachystegia spiciformis* and *Julbernadia globiflora*. Associated species include *Faurea* spp, *Combretum molle*, *Uapaca kirkiana*, *Pterocarpus angolensis*, *Albizia antunesiana*, *Strychnos* spp, and *Parinari curatelifolia*. Relatively undisturbed Miombo woodland is characterized by a single stratum of 6 to 12 m high, with a canopy cover of up to 80 per cent.

9.1.3Acacia woodland

Acacia woodlands occupy extensive areas with eutrophic soils with a high base status particularly along river valleys and low-lying areas (ie.Insuza vlei). These are dominated by various Acacia species. Some parts along Bembesi River and Gwaai River have unique riverine vegetation dominated by *Acacia polyacantha* with associated *Acacia albida.*

9.1.4 Terminalia-Combretum woodland (Combretaceae)

Terminalia-Combretum woodlands are characterized by *Terminalia sericea* and *Peltophorum africanum* species, but include a range of other tree and shrub species, such as *Combretum* spp, *Lannea discolor*, *Faurea saligna*, *Pterocarpus angolensis*, *Sclerocarya birrea* and *Kirkia acuminata.*

9.1.5 Mopane woodland (*Coleospermum mopane*)

There are types of mopane woodlands in Gwaai forest. There are mopane woodland on rocky terrain and mopane on sands with underlying clay soils.

9.2 Wildlife

Gwaai forest has a diversity of fauna that include large herbivores, avifauna and small antelopes. Game includes the elephant, giraffe, leopard, hyenas, eland, sable, wildebeest, impalas, zebras and ostriches amongst others. Occasional crocodiles are sighted as they roam the Bembesi River during the periodic annual flows.

Most of the game is concentrated along the Insuza vlei that is blocks L and M which is the forest's intensive protection zone. The game population censuses for the past years are shown in table 3 below and table 4 shows permitted off take.

9.3 Thatch Grass

Thatch grass is found mainly in vlei areas or low lying water courses. The main and popular thatch grass species found in Gwaai forest is the *Hyparrenia hirta* although other species also occur in limited quantities including the broom grass. Insuza vlei which covers approximately 46 200ha has a harvestable area of 3 300ha which yields +/-40 000 bundles of thatch grass per year. Mabhikwa vlei also yields about +/-1 000 bundles per year. However according to records only 6625 bundles are harvested per year.

9.4 River sand

River sand is sold to local individuals at a prescribed fee/m^3, and given for free when developing community institutions i.e. Hospitals, clinics, dip tanks etc.

9.5 Burkea caterpillars

Caterpillars grow seasonally during the rainy season in areas like Block K and G where there are *Burkea africana* tree species. The caterpillars are collected by local communities as a source of household protein.

9.6 Firewood

Firewood is available in Gwaai Forest. Concessionaires harvest firewood from branch wood left after timber harvesting. Firewood is also sold from offcuts after sawmilling at the Kara mobile mill at the forest's HQ.

9.7 Grazing

Forage for cattle in Gwaai is in two categories. We have area where the forest settlers and neighbouring communities are grazing their cattle and areas that have been set aside for grazing leases.

10. FOREST MANAGEMENT

10.1 Tenure and use rights

Gwaai forest is open for leasing to small business operators to cater for forest resident in designated shopping centres, Radio receivers and mobile telephone boosters, Veterinary foot and mouth control points grazing leases and firewood leases in harvested areas. All lease agreements of Gwaai forest shall be kept up to date and developers managed for compliance in operations and payment obligations. Local communities shall be granted use rights as long as their activities do not threaten the integrity of the forest. The use rights shall be communicated to the community concerned and documented including procedures in reporting disputes.

10.2 Benefits from the forest

Gwaai forest has a wide range of viable environmental, economic and social benefits. To ensure sustainability, timber and non-timber forest product resource inventories are conducted in conjunction with socio resource use inventories. Forestry Commission and local communities shall consult on the range of benefits that can be accessed by the communities and modalities for such access shall be documented and made known to affected parties. Where possible, Forestry Commission or its agents shall initiate corporate social responsibility projects to neighbouring communities in order to create community interest in the upkeep of the forest.

10.3 Environmental safeguards

The management objectives of Gwaai forest are that the operations must conserve biodiversity and its associated values of soils, water and fragile Kalahari sand formations which maintain the functions and integrity of the forest. Attention shall be paid for potential negative impacts causing soil erosion, habitat deterioration, and species diversity. Hunting shall be subject to approved quotas and permits and records kept for animals killed according to sex and species. Permanent sample plots (PSPs) shall be maintained representing existing

forest cover types found in Gwaai forest and assessment records for the plots shall be documented and updated.

11. DESCRIPTION OF MANAGEMENT ZONES

11.1 Description of activities in management Zones

Gwaai forest is divided into four management zones. The zones were delineated based on the differences of resources found in each zone. The zoning programme forms part of the management plan as it identifies the quality and desirable use of specific parts of Gwaai forest. Management zones are referenced according to the block where the resources to be managed are found as shown on Figure 2.

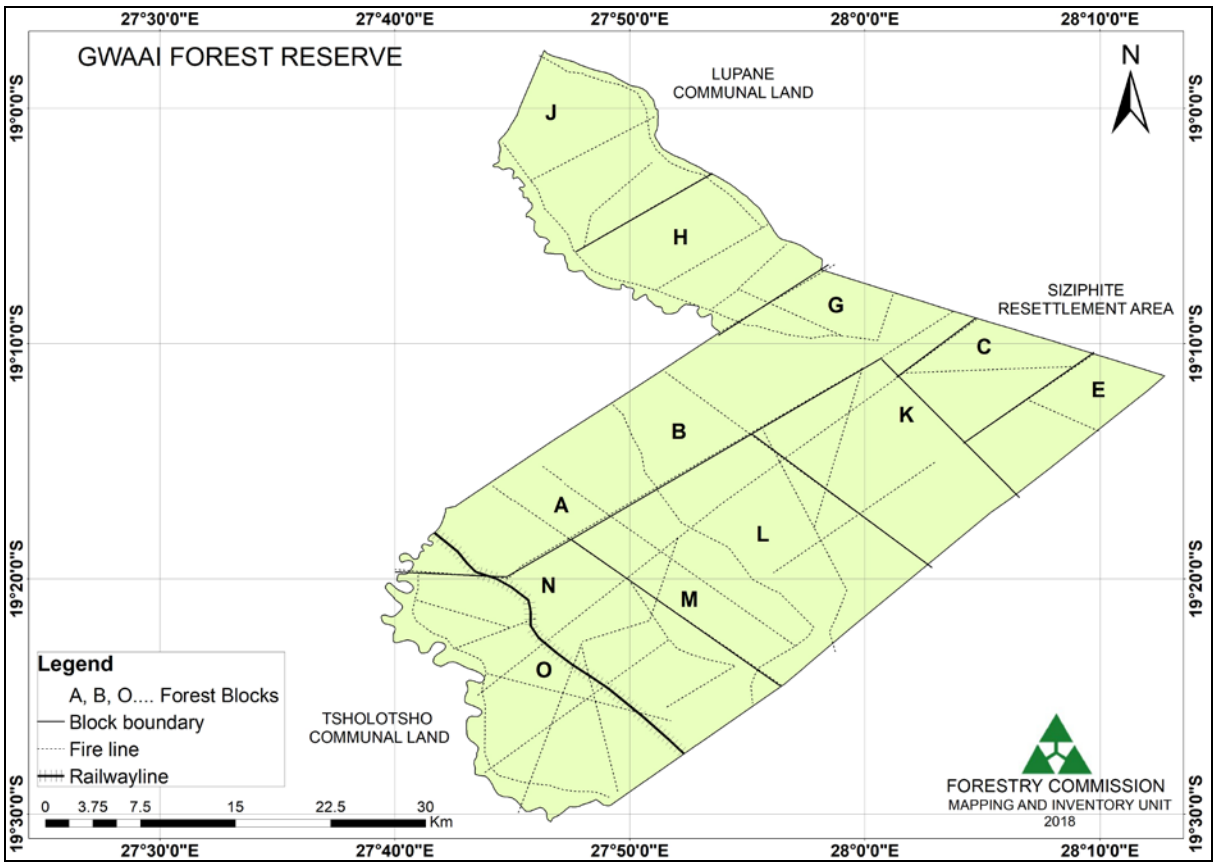

Figure 2. Management Blocks for Gwaai forest ; Source: Forestry Commission mapping and inventory unit (2015)

11.2 Zone A

Timber production

This zone is located in forest Blocks A, B, C, E, G, H, J, K and O and is characterised by large quantities of merchantable commercial timber species like *Baikiaea plurijuga* (teak), *Guibourtia coleosperma* (rosewood) and *Pterocarpus angolensis* (mukwa).

11.3 Zone B

Vleis or grassland areas

Zone B is located along the Insuza and Mvana vleis. Thatch grass production shall be used as a vehicle to improve community relations in order for locals to support forest management programmes. The access for thatch grass and sharing modalities shall be documented and communicated to affected parties. This plan proposes a negotiable sharing ratio of 1:1between Forestry Commission and the locals. Thatch grass is also used for the renovations of the organisation's chalets.

11.4 Zone C

Hunting

This zone comprises Blocks L, M, and N. This is also an intensive protection zone. Trophy hunts and conservation hunts shall be carried out in this zone subject to approved quotas and hunting permits. These will be administered from Amandundumela hunting camp which is located in this zone. This camp as forestry commission asset must be protected from fires at all times.

12 Gwaai Forest Monitoring Plan

Aspect to be monitored	Monitoring frequency	Responsible officer	Remarks
Changes in vegetation cover types	5 years	Gwaai Forester	-Engage R&T experts - compare changes since 1992 - produce assessment reports
Biomas,growth rates, volumes	5 years	Mapping and inventory officer	- Maintain/establish PSPs - Produce assessment reports
Fire ecology assessment	5 years	Forester Ecologist	- Establish PSPs - Produce assessment reports
Poaching trends-wildlife and timber products	Annual	Security officer	- Develop a reporting template - Document incidences from 2005 - Map out hot spots
Animal population trends	Annual	Forester/Ecologist	- Produce census reports
Population trends for forest settlers	Annual	Gwaai Forester	- Produce census reports
Map areas with IAS and bush encroachment and monitor	Every two years	Gwaai Forester	- Produce reports - document problem species
List all ongoing researches by other institutions	Annual	Gwaai Forester	- update research Directory
Monitor fire incidents	Annual	Gwaai Forester	- produce reports - list causes of fires - map fire hot spots
Monitor general land	Annual	Gwaai Forester	- produce reports

and forest degradation			- map out degraded areas - plan for corrective action
Monitor forest pests and diseases	Annual	Gwaai Forester	- produce reports

Annex 5: HARVESTING PLAN FOR BLOCK K GWAAI FOREST RESERVE

BLOCK K GWAAI FOREST RESERVE

COMPILED BY

B.NDLELAMBI

AND

M SHONIWA

TIMBER HARVESTING PLAN

The harvesting plan ensures-

1. Only the trees of breast height over bark (ob) diameter of 31 cm are cut. Breast height diameter is the tree thickness measured at a height of 1.3 meters from the ground on the side away from the direction of lean in any leaning tree.
2. Diameter is constructed as mean of two caliper readings at right angles to it or reading from a diameter tape.
3. Exploitation of marked trees only.
4. Construction of roads and tracks as well as use of existing roads and removal of timber whilst ensuring minimal damage to the forest.
5. Exploitation of timber in such a manner as not to cause undue damage to the standing vegetation.
6. Trees are cut in a manner that ensures maximum degree of utilization and minimum wastages. Stump height must not be above 25 cm from the natural ground.
7. Measures that require reduction of environmental damage as a result of operation.
8. That 2 seed trees/ hectare are left as a seed bank for regeneration purposes.
9. The concession is divided into avenues and coupes and the sequence and manner of exploitation is indicated.

1. Introduction

Block K logging concession is run by Forestry commission to generate funds for its operations. The main objective is to sustainably harvest commercial timber species which are mainly Teak, Mukwa and Rosewood.

2. Project Location

The concession area covers an area of 6600ha and is located in the K block of Gwaai forest. The block is situated within the boundaries Bembesi River on the northern side, g mile line to the south, eastern boundary to the east and Masheke line to the west.

3. Timber distribution and estimated harvesting duration

Harvesting in this block is projected to take 17 months as indicated in the table below

Timber belt number	Location	Area (ha)	Estimated species composition for utilizable timber	Estimated harvesting duration
1	Centre/Masheke	600	Teak-50% & Mukwa-50%	1 month
2	Centre/Kale	500	Teak - 85% Rosewood-14% Mukwa- 1%	3 months
3	Centre/Chakabhadha	1200	Teak-70% Rosewood-	4 months

			29% Mukwa-2%	
4	Chakabhadha/Power line	1100	Rosewood-80% Teak-20%	2 months
5	Power line/ Duiker	1700	Teak 100%	4 month
6	Duiker/ Transport	800	Teak 60%	1 month
7A & 7B	Saltlick/Kelly	700	Teak 60% Rosewood-40%	2 month

Harvestable timber.

The targeted species with a minimum diameter of 31cm ob will be selectively marked for felling. At least one phenotypically sound tree of each targeted species will be deliberately spared as a seed bank. Such trees will be conspicuously banded with a white paint at breast height.

Cutting sequence

Harvesting will start from coupe 1 avenue 1 and proceed progressively unless otherwise there is a special demand for a particular species that would warrant jumping to a coupe where the species is predominant. This is for the purpose of monitoring compliance to the plan to minimize recurring disturbance to the ground.

Environmental considerations

Coupes will be 1600m wide. These coupes will have 4 avenues each which will be 400m apart. These avenues will be bisected by cut lines to confine dragging distance to a maximum of 200m. Dragging on the trail will not be done for more than 3 times to avoid fragile Kalahari sand erosion.

Equipment and use

All operations will be done by Forestry Commission but in the event of other operations being contracted, the contractor will operate under the direct supervision of Forestry Commission.

Manpower

The contractor will bring his own employees for the purposes of dragging and hauling to the ramp. Forestry Commission would take responsibility in the loading from ramp to sawmill.

Forestry Commission will have the following employees for the purposes of felling and auditing.

Job title	No
Timber measurers	4
Chainsaw operators	2
Assistant chainsaw Operators	2
Avenue markers	4
Supervisor	1
Total	13

The following equipment will be used.

Item	Quantity	Use	Organization
Chainsaw	2	Felling	Forestry Commission
Hammer stamp	1	Timber identity(FC2)	Forestry Commission
Calipers	3	Volume calculation	Forestry Commission
Measuring stick	4	Volume calculation	Forestry Commission
Tractors		Dragging/hauling	Hyde Park Timbers
Dragging chains		dragging	Hyde Park Timbers
Haulage trucks		hauling	Hyde Park Timbers

Felling methods

A selective method of felling will be used. There will be adherence to the recommended minimum diameter as per requirement. Practical damage to existing vegetation will be minimized. All felled stems should not hang on existing vegetation and all logs to be properly de-branched. Stump height should not exceed 25cm from the ground level.

Extraction method

- Stumps to avenue-logs will be dragged by tractors in batches of 3.
- Each drag line will not be used for more than three times to avoid erosion.
- Hauling to the ramp will be done by the use of tractors
- Manual loading will be done into the trailers which haul to ramp through existing routes and avenues
- At the ramp manual off-loading will be done
- Movement to the next coupe will be done after all marked and felled logs are removed from the previous coupe.

Ramp management

- Two log ramps of approximately 3ha will be strategically created towards the base line
- A field base camp will be created close to a community water point just close to the ramp
- The ramp will hold a stock equivalent to one month harvesting quota
- Volume scheduling at ramp will be FiFO (first in first out)

Production costs

Below is a template for use in computing production volumes and costs to monitor performance.

Activity	Daily output (m^3)	Cost
Felling	xx	
Dragging and Hauling	xx	
Haul to sawmill	xx	
Loading	xx	
Total	xx	

The annual target is pegged at xxxx (m^3)

Health and safety

- Safety protective clothing that include overalls, helmets, leather gloves and steel cap shoes will be provided

- The employees will occasionally go for safety briefing and training under St Luke's hospital
- Siting of camp will be as per the Ministry of Health and Child Welfare regulations
- Periodic fogging to prevent mosquito breeding will be done in collaboration with the local Environmental Health Technician (EHT).
- A first aid kit must be made available at the camp
- Both radio and cellphone communication will be used for normal communication and as an emergency response plan.

Water and sanitation

- Two pit latrines will be constructed on camp site to cater for both male and female employees
- Employees out in the field will use cat sanitation
- water containers will be provided for the purposes of water storage
- oil and fuel will be kept under lock in a storeroom floored with sawdust to avoid spillage on the ground

Spots and Recreation

A social team in conjunction with the community will be established using Mafa School.

Map of the area to be harvested. See next page.

Annex 6: Medical Emergency Response Procedure

1. Trained Health and Safety Designee will stabilize injured party as much as possible and as necessary

2. If injured party can be moved, transport him or her to St Lukes Hospital in Lupane

3. If injured party cannot be moved, call St Lukes Hospital on 0772 462 569 , 4. Notify the District Conservator immediately 5. Incident must be recorded and reported to the province, head office FC Authorities, WWF World Bank and NSSA

Annex 7: National Policy, Laws and Regulations Governing the Project

The kiln will be installed and operate in accordance with national laws for compliance.

The specific legislation that the Project is subject to includes;

1.2.1 The National Environment Policy and Strategies (June 2009)

The policy's vision is to alleviate poverty and improve the quality of life of the people of Zimbabwe. To achieve this vision the goal of the policy is to prevent irreversible environmental damage, maintain essential environmental processes and preserve the broad spectrum of biological diversity .This will sustain the long term ability of natural resources to meet basic needs of people, enhance food security, reduce poverty, and improve the standard of living of Zimbabweans through long term economic growth and the creation of employment.

1.2.2 Environmental Management Act (Cap. 20:27)

The Act provides for the sustainable management of natural resources and protection of the environment; the prevention of pollution and environmental degradation; the preparation of a National Environmental Plan and other plans for the management and protection of the

environment. This calls for minimization of environmental damage during the pre-operational, operational and post operation activities of prescribed development initiatives.

1.2.3 The National Museums and Monument Act (Cap. 25:11)

The Act protects the archaeological and paleontological heritage of Zimbabwe. Section 4 Subsection 2(e), requires National Museums and Monuments of Zimbabwe to "initiate, participate and monitor scientific research into any matter pertaining to Zimbabwe's cultural, historic and natural heritage". Section 20(c) requires all commercial developers to carry out archaeological and paleontological impact assessments before any development takes place.

1.2.4 Archaeological Impact Assessments – Guidelines for Planning Authorities and Developers

The guidelines were crafted in order to reinforce the National Museum and Monument Act (Cap. 25/11) in its endeavour to protect the archaeological and paleontological heritage during development of projects. They spell out the need to investigate a site before the intended development commences. The investigation would reveal the site conditions and what mitigation measures to be taken in the event that archaeological and paleontological material are associated with the site.

1.2.5 Parks and Wildlife Act (Cap. 20:14)

This Act deals with the protection of wildlife, conservation, propagation or control of the wild life, fish and plants of Zimbabwe and the protection of the landscape and scenery to confer privileges of owners or occupies of alienated land as custodians of wildlife, fish and plants among other things. Section 59 prohibits development and activities that are likely to seriously affect, endanger or injure special protected plants and animals.

Section 48 lists specially protected indigenous plants; the plants specified in the first column of the Seventh Schedule are declared to be specially protected indigenous plants.

Section 50 states that no person shall pick any specially protected indigenous plant except in terms of a permit issued in terms of section fifty-one.

1.2.6 Public Health Act (Cap.15:09)

The Act deals with:

- Control of infectious diseases
- Notification by medical practitioners (sections 19 & 37),
- Sale of unwholesome, diseased or contaminated articles of food (section 69),
- Examination of premises (section 90)
- Prohibitions in respect of back-to-back dwellings and rooms without through ventilation (section 93), all buildings shall comply with the specifications of this Act.

1.2.7 Forest Act (Cap. 19:05)

The Act sets guidelines for the management of woodlands and forest on either state or private land and also provides for the control of exploitation of forest resources.

1.2.8 Land Survey Act (Cap.20:12)

Deals with beacons and boundaries, it stipulates that beacons and boundaries lawfully established shall be impeachable where they have been established by re-survey and diagrams approved, or where their positions and diagrams have been approved in the original.

1.2.9 Regional, Town and Country Planning Act (Cap. 29:12)

The main objectives of the statutory instrument are:

- To provide for the planning of regions, districts and local areas with the objective of conserving and improving the physical environment and in particular promoting health, safety, order, amenity, convenience and general welfare, as well as efficiency and economy in the process of development and the improvement of communication,

- To authorize the working of regional plans, master plans and local plans, whether rural or urban and to also provide for the acquisition of land,
- To provide for the protection of urban and rural amenities and the preservation of building and trees and generally to regulate the appearance of townscape and landscape, to provide for the acquisition of land.

1.2.10 Water Act (Cap. 20:24)

The Water Act spells out that water belongs to the state. The Act provides for:

- The planning of optimum development and utilisation of water resources of Zimbabwe.
- The application for the rights to use and control public waters and the prevention and control of water pollution.

1.2.11 Roads Act (Cap. 13:12)

This Act sets requirements and regulations for the use and protection of roads.

1.2.12 Atmospheric Air Pollution Regulations (S.I. 72 of 2009)

These regulations underpin the importance of reducing dust and fumes emissions to the required specifications or limits.

1.2.13 Effluent and Solid Waste Disposal Regulations (S.I. 6 of 2007)

The statutory instrument provides for disposal of effluent and solid wastes in manner that does not adversely affect the environment.

1.2.14 Hazardous Substances, Pesticide and Other Toxic Substances Regulations (S.I. 12 of 2007)

This regulation provides for the safe handling and use of hazardous substances.

1.2.15 Hazardous Waste Management Regulations (S.I. 10 of 2007)

This regulation refers to the management and safe disposal of hazardous waste substances and materials.

1.2.16 The Labour ACT (Chapter. 28:01)

Installation of the wood kiln and its operation (referred to as the activity) will adhere to Zimbabwe labour code and standards, i.e. minimum wage, workplace subject to labour inspection and in compliance with the ACT which was promulgated to declare and define the fundamental rights of employees; to define unfair labour practices; to regulate conditions of employment and other related matters; to provide for the control of wages and salaries; to provide for the appointment and functions of workers committees; to provide for the prevention of unfair labour practices. Thus the Act provides for the employees rights and obligations.

OCCUPATIONAL SAFETY AND HEALTH ACT (85 of 1993)[28]

The Act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work

Annex 8: World Bank Requirements

Safeguards Policies

OP 4.01 Environmental Assessment

The Environmental Assessment policy requires projects receiving funding from the World Bank to identify, avoid, and mitigate the any potential negative environmental and social impacts associated with its activities, while enhancing the positive benefits. This ESMP and the associated HSBCP

[28]https://www.google.com/search?client=firefox-b-ab&q=OCCUPATIONAL+HEALTH+%26+SAFETY+ACT+%2885+OF+1993%29

ESMF fulfil those requirements for this wood drying kiln installation and operation.

OP 4.04 Natural Habitats

The Natural Habitats policy seeks to ensure that World Bank-supported infrastructure and other development projects take into account the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water areas where most of the native plant and animal species are still present). Specifically, the policy prohibits Bank support for projects which would lead to the significant loss or degradation of any Critical Natural Habitats, whose definition includes those natural habitats which are legally protected, officially proposed for protection, or unprotected but of known high conservation value. Gwaai Forest is a legally protected area mostly to prevent illegal and widespread deforestation but it does not have any rare, threatened, endangered or vulnerable (RTE&V) species. It is most appropriately classified as a protected area with sustainable use of natural resources. This is a largely natural area where low-level non-industrial use of natural resources compatible with nature conservation is one of the main aims of the area. In this case, sustainable timber harvesting is the main objective for the conservation of this habitat.

OP 4.10 Indigenous Peoples

This policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous

Peoples (IP). For all projects that are proposed for Bank financing and affect Indigenous Peoples, the Bank requires the borrower to engage in a process of free, prior, and informed consultation. The Bank recognizes that the identities and cultures of Indigenous Peoples are inextricably linked to the lands on which they live and the natural resources on which they depend. For purposes of this policy, the term “Indigenous Peoples” is used in a generic sense to refer to distinct, vulnerable, social and cultural groups possessing the following characteristics in varying degrees:

- self-identification as members of a distinct indigenous cultural group and recognition of this identity by others
- collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories
- customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
- an indigenous language, often different from the official language of the country or region.

San People in the Tsholotsho district adjacent to the Hwange National Park are considered IP. An Indigenous Peoples Planning Framework for HSBCP has been prepared, consulted upon in a culturally appropriate manner and publicly disclosed in Zimbabwe and on the World Bank external website.

OP 4.36 Forests

The Bank's forests policy aims to reduce deforestation, enhance the environmental contribution of forested areas, promote forestation, reduce poverty, and encourage economic development. The Bank’s policy is anchored on three equally important and interdependent pillars to guide future Bank involvement with forests:

- Harnessing the potential of forests to reduce poverty,
- Integrating forests in sustainable economic development, and

- Protecting vital local and global environmental services and forest values.

OP 4.11 Physical Cultural Resources

The objective of the policy is to avoid, or mitigate adverse impacts on cultural resources from development projects that the World Bank finances. The policy defines physical cultural resources (PCR) as movable or immovable objects, sites, structures, group of structures and natural features that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance. Cultural practices such as rainmaking ceremonies and burial sites are some examples of cultural resources covered under the policy. This ESMP includes chance find procedures to guide the course of action if any physical cultural resources are found.

OP 4.12 Involuntary Resettlement

Involuntary Resettlement is triggered in situations involving involuntary taking of land or involuntary restrictions of access to legally designated parks and protected areas or when the Bank assisted project's achievement of objectives is dependent on an already existing restriction. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts to displaced people. It promotes participation of displaced people in resettlement planning and implementation, and its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects. HSBCP has a Process Framework (which was consulted upon and publicly disclosed in Zimbabwe and on the WB external website) because the project involves the Hwange-Sanyati protected area which restricts community access to resources. O.P 4.12-Involuntary Resettlement is triggered when:

i. The existing restriction to resources is directly and significantly related to the Bank-assisted project.
ii. The existing restriction to resources is necessary to achieve the objectives of a Bank-assisted project.
iii. The restriction is carried out or planned to be carried out, contemporaneously with the Bank–assisted project.

World Bank Environmental, Health and Safety Guidelines

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP)[29]. When one or more members of the World Bank Group are involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. These General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines which provide guidance to users on EHS issues in specific industry sectors. The EHSG most important for this project in the General Guidelines[30] are the 1.1 Air Emissions and Ambient Air Quality, 1.3 Wastewater and Ambient Water Quality, 1.6 Waste Management, 1.7 Noise, Occupational Health and Safety (OHS) 2.3 Physical Hazards, 2.7 Personal Protective Equipment (PPE), 3.2 Structural Safety of Project Infrastructure and OHS under Construction/Decommissioning 4.2 as well as 4.3 Community Health and Safety. The relevant industry specific guidelines include the *Sawmilling and Wood-based Products Guidelines* and *Forest Harvesting Operations.*[3132] All EHSG are located online at www.ifc.org/ehsguidelines.

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[29] Defined as the exercise of professional skill, diligence, prudence and foresight that would be reasonably expected from skilled and experienced professionals engaged in the same type of undertaking under the same or similar circumstances globally. The circumstances that skilled and experienced professionals may find when evaluating the range of pollution prevention and control techniques available to a project may include, but are not limited to, varying levels of environmental degradation and environmental assimilative capacity as well as varying levels of financial and technical feasibility.

[30] World Bank Group: International Finance Corporation. *General Environmental, Health, and Safety Guidelines*, **www.ifc.org/ehsguidelines**, April 30, 2007.

[31] World Bank Group: International Finance Corporation. *Sawmilling & Manufactured Wood Products Environmental, Health, and Safety Guidelines:*
, **www.ifc.org/ehsguidelines**, April 30, 2007.

[32] World Bank Group: International Finance Corporation. *Forest Harvesting Operations Environmental, Health, and Safety Guidelines,* **www.ifc.org/ehsguidelines**, April 30, 2007.

Annex 9: Grievance Redress Mechanism for Forestry Commission

FORESTRY COMMISSION GRIEVANCE HANDLING PROCEDURE

GRIEVANCE PROCEDURE DIAGRAM OF STEPS

STEP 7

MINISTRY OF PUBLIC SERVICE, LABOUR

MANPOWER PLANNING & SOCIAL WELFARE

↑

STEP 6

GENERAL MANAGERS

WITHIN 10 WORKING DAYS

↑

STEP 5

DIVISIONAL/DEPARTMENTAL HEARING

TO HEAD OF DEPARTMENT..... PERSONNEL REPRESENTATIVE:

EMPLOYEE..... SUPERVISOR

EMPLOYEE REPRESENTATIVE .....WITNESS

WITHIN 14 WORKING DAYS

↑

STEP 4 INQUIRY

HEAD OF SECTION, EMPLOYEE, AND EMPLOYEE REPRESENTATIVE:-

SUPERVISOR

WITHIN 5 WORKING DAYS

↑

STEP 3 WRITTEN GRIEVANCE

EMPLOYEE..... HEAD OF OFFICE

WITHIN 2 WORKING DAYS

↑

STEP 2 VERBAL GRIEVANCE

EMPLOYEE AND EMPLOYEE REPRESENTATIVE .... SUPERIOR

WITHIN 2 WORKING DAYS

↑

STEP 1 VERBAL GRIEVANCE

EMPLOYEE..... SUPERIOR

WITHIN 2 WORKING DAYS

GRIEVANCE PROCEDURE STEPS

EXPLANATION NOTES

Step 1

The employee advises supervisor of his/her or public's grievance and the Supervisor should resolve it within two working days. OR employee or public can make use of the onsite grievance box which accommodates anonymous complaints. The District Conservator has the responsibility to record all the grievances both from the employees and from the public at the local level.

Step 2

If an employee is not satisfied with the supervisor's resolution to his/her grievance given under Step 1, he shall seek the assistance of the Workers' Committee Member to witness the discussion of the grievance between the employee and supervisor. The member of the Workers' Committee acts as a mediator.

Step 3

If the grievance is not resolved within two working days, the employee shall report his/her grievance to the Supervisor's head of office in writing. The Head of Office shall resolve the grievance within two working days and shall advise the employee in writing.

Step 4

If the grievance is not resolved under Step 3, the Head of Office shall call an enquiry into the grievance within five working days. The enquiry panel shall be composed of :-

(a) Head of Office [Chairman]

(b) Personnel Representative [Advisor]

(c) Employee Representative

(d) Recorder of Minutes

(e) Complaining Employee

(f) Supervisor of complaining employee

N.B. It will be noted that the Personnel Representative (b) and the recorder of minutes (d) are not members of the panel. The panel at the end of the enquiry shall advise the complaining employee and Supervisor of its findings and recommend solution to the grievances in writing.

Step 5

If the employee is not satisfied he/she may appeal in writing to the Divisional/Departmental Manager who on receipt of the notification of grievance shall convene an enquiry and hear the grievance within fourteen working days.

The Panel shall be composed of:-

1 Divisional Manger [Chairman]

2 Management Representative [external to the section where the grievance is from]

3 The Workers' Representative

In attendance shall be:-

1 Personnel Representative

2 Recorder of Minutes.

Procedure

1 The Panel shall examine the record of previous enquiry and may conclude the issue on that basis or

2 The Panel may, in addition to the examination of the record, call for evidence or more information from the complaining employee and the Supervisor of complaining employee and Head of Office.

3 The panel shall reach a conclusion and advise the complaining employee, his/her Supervisor and Head of Office of its findings, in writing.

Step 6

If the complaining employee is still not satisfied, he/she shall submit his grievance to the General Manager, in writing, stating the reasons of his dissatisfaction with the outcomes of steps 1-5. On receipt of the grievance notification, the General Manager shall convene an enquiry into the grievance and conclude the matter in ten working days.

The Panel shall be composed of:-

1 General Manager/Deputy General Manager [Chairman]

2 Manager of Division other than where the grievance is from

3 Two Workers' Representatives

In attendance shall be:-

1 Manager Human Resources & Administration

2 Recorder of Minutes

Procedure

The Panel shall examine the records of previous enquiries and may conclude the grievance on those bases. If the panel notices any contradicting information it may call either complaining employee and/or the Divisional Manager to come and clarify the points.

At the end of the enquiry, the Panel shall decide on the grievance which decision is final. The decision shall be communicated to the complaining employee and Divisional Manager in writing.

Step 7

If the employee is not satisfied by the decision of the panel set by the General Manager and wishes to pursue his grievance further, by going external, he/she shall advise the organisation of his/her intention.

The public can call on +263 4 498436-9, communicate through the FC website www.forestry.co.zw(info@forestry.co.zw) or the suggestion box at the Lupane FC Office with questions and complaints. FC will track and resolve all complaints in accordance with their grievance redress mechanism. This system allows for escalation of issues from the lowest level in FC to the CEO and the Board if there is no resolution. The District Conservator will track and resolve complaints. If the complaint is not resolved, the Chief Conservator becomes responsible. If the matter is still not resolved, it goes to the Deputy General Manager. If not satisfied, the complainant can escalate to the General Manager, the Board and eventually to the Ministry responsible for Environment who will resolve it. Stakeholders have access to any level in the hierarchy at any time.

Annex 10: Grievance Redress Mechanism for the Hwange-Sanyati Biological Corridor Project

September 2018

Grievance Redress Mechanism for the Hwange-Sanyati Biological Corridor Project include the statement after project decommissioning.

Objective

To ensure equitable resolution to any grievances brought forward by any stakeholders that would have been affected by the implementation of the Hwange-Sanyati Biological Corridor Project (HSBCP) in a timely and cost-effective manner

Project implementation structure

The HSBCP is a GEF/World Bank funded project that is being executed by WWF-Zimbabwe and implemented by the Government of Zimbabwe through 4 agencies; namely Parks and Wildlife Management Authority, Environmental Management Agency, Forestry Commission and Communal

Areas Management Programme for Indigenous Resources (CAMPFIRE Association). These 4 organizations are the ones that have direct contact with stakeholders and communities in the areas of project implementation, while WWF has direct contact with the implementing partners and suppliers in the procurement process.

Project stakeholders

Project stakeholders include but are not limited to other government departments, community members/leaders, suppliers, service providers, churches, business community and institutions such as schools.

Grievances redress systems in the partner organizations

Each of the 4 partner organizations has their own systems for addressing grievances and established pipelines for escalation in case of a non-resolution. In order not to establish parallel structures, the project will adopt the use of existing resolution mechanisms for each partner organization. This means that FC's system will be used for this activity. These systems allow for escalation of issues from the lowest level in the organization to the CEO and the Board if there is no resolution. From the Board, the complaint procedurally goes to the Ministry responsible for Environment who will resolve it. Stakeholders have access to any level in the hierarchy at any time. It is the responsibility of all partners to ensure that awareness on the GRM is created for all stakeholders and they know where to direct their complaints using communication channels specified in the HSBC Communications Strategy.

Grievance redress in WWF-Zimbabwe

When these systems have failed, the complainant can lodge the complaint with WWF-Zimbabwe as the executing agency. It is important to note that some complaints can come directly to WWF-Zimbabwe and WWF is obliged to address them even though they may not have gone through the responsible partner.

When WWF receives the complaint, it will be logged in a complaints register which will be in the format in Table 1. The grievance shall be responded to within 5 working days.

Table 1: Format of complaints register

No.	Date	Name of complainant	Project component	Issue	Mode of communication	Responsibility	Resolution	Date of resolution & Feedback

The complaints register shall be maintained at WWF-Zimbabwe office under the responsibility of the Conservation Manager and shall be made available to all interested parties.

World Bank resolution mechanism

The complainant also has the right to lodge a complaint with the World Bank, which shall trigger its own grievance resolution mechanism.

Contact details for lodging complaints

World Bank

www.worldbank.org

Fraud & Corruption option provided on World Banks website

WWF-Zimbabwe

10 Lanark Road Belgravia, Harare, +263 24 252532/4

wwfzimbabwe@wwf.org.zw

The email address is accessible by the Project Finance Analyst (responsible for internal controls & risk management)

Complainants also have the option of calling on the toll free Fraud & Corruption lines responded to from WWF International Head Office in Switzerland. The numbers are 8644041044

Ministry of Environment, Tourism and Hospitality Industry

12th floor Kaguvi

Cnr 4th and Central Avenue, Harare

Tel: + 263 470 1681-3

Zimbabwe Parks and Wildlife Management Authority

Botanical Gardens, Cnr Borrowdale Road/Sandringham Drive,

Harare

Telephone: 0772433901

Environmental Management Agency

Stand No 685/6

Cnr Lorraine/Faber Drive

Bluff hill

Website: **www.ema.co.zw**

Toll free: 08080028

Forestry Commission

1 Orange Groove

Box HG 139

Highlands

Harare, Zimbabwe

Tel: +263 4 498436 – 9

CAMPFIRE Association

Mukuvisi Woodlands

Corner Glenara South/Hillside Road

P. O. 661 Harare, Zimbabwe

Tel: +263 4 747429/30

Website: http: www.campfirezimbabwe.org

Annex 11: Solid Waste Management Plan

Under the HSBCP, FC has purchased and will install a wood drying kiln. This will necessitate construction to form a foundational slab and to erect the kiln and timbershed. Accordingly, these activities will generate minimal waste during construction and operation of the kiln.

Harvesting

Harvesting activities are ongoing and solid waste management (timber offcuts) will proceed in accordance with current FC practices.

Construction and Decommissioning

FC will prevent and control construction site solid waste as per national guidelines (Statutory Instrument 6 of 2007) and *EHSG General* Section 1.6 Environmental Waste Management and 4.1 Construction and Decommissioning using a waste management hierarchy that considers prevention, reduction, reuse, recovery, recycling, removal and finally disposal of wastes.[33] · It will be priority to avoid or minimize the generation of waste materials, as far as practicable. Where waste cannot be recovered or reused, it will be treated, destroyed, and/or disposed of in an environmentally sound manner.

Non-hazardous solid waste generated at the construction and decommissioning site may include excess fill materials from grading and excavation activities, scrap wood and metals, and small concrete spills. The work site is relatively small and any potential release of hazardous materials like petroleum based products, such as lubricants, hydraulic fluids, or fuels during use of equipment, would be minor and without significant impact. Nonetheless, techniques for prevention, minimization, and control of these impacts include:

- Providing adequate secondary containment for the temporary storage of fluids such as lubricating oils and hydraulic fluids as necessary
- Training workers on the correct transfer and handling of chemicals such as lubricants as necessary
- Providing cleanup equipment on site and training in the equipment deployment

Operation of the kiln should only produce small amounts of additional waste including ash from the burning of the wood off cuts which will be disposed of at the Lukosi dumpsite because the kiln will only

[33] World Bank Group: International Finance Corporation. *General Environmental, Health, and Safety Guidelines*, **www.ifc.org/ehsguidelines,** April 30, 2007.

dry out the wood. In fact, the kiln will provide an environmental benefit of using up the wood offcuts and waste from the sawmill in the boiler.

Annex 12: ESMP Preparers

	Name	Position	Signature	Date
Compiled By	**BSES Consultants**	**Lead Consultant**		July 2019
Responsible Person	**Bernard Chiparange**	**Forest Commission District Conservator**		July 2019
	Alleta Nyahuye	**HSBCP PIU (WWF Zimbabwe)**		September 2019