Analysis of the socio-economic and ecological values of Bugoma forest in Buhanguzi County, Kikuube District

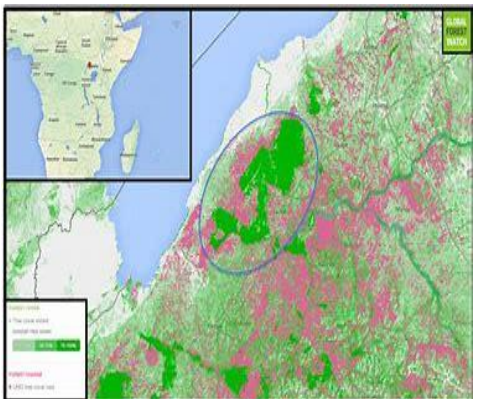

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Table of Contents

ACRONYMS **4**

GLOSSARY **5**

1. INTRODUCTION **6**

1.1 THE REPORT 6
1.2 THE PROBLEM ADDRESSED BY THE ASSESSMENT 6
1.3 THE STUDY METHODOLOGY 7

2. BASELINE INFORMATION **8**

2.1 THE BUGOMA FOREST LANDSCAPE 8
2.1.1 The Bugoma Central Forest Reserve *8*
2.1.1.2 Legal Status 9
2.1.1.3 Management objectives 10
2.1.2 The Socio-economic and ecological values *10*
2.1.2.1 Ecological values 10
2.1.2.2 Socio-economic values 11
2.1.2.3 Indirect /intangible values/benefits 11
2.2 THE HOIMA SUGAR LIMITED AND SUGAR CANE PROJECT 11
2.2.1 The Company *11*
2.2.2 The threat posed by sugar cane growing by Hoima Sugar Ltd *12*
2.3 POLICY AND LEGAL FRAMEWORKS PERTAINING TO BUGOMA FOREST AREA AND EIAS 14
2.3.1 Framework for Bugoma Forest *14*
2.3.2 Frame works for EIAs *16*
2.3.3 International Policy *17*

3 THE ECONOMIC BENEFITS TO UGANDA GOVERNMENT **19**

3.1 OVERVIEW OF ECONOMIC VALUE OF FORESTS AT MACRO-LEVEL 19
3.2 FOREGONE VALUES OF BUGOMA CFR IN FAVOUR SUGAR CANE 20
3.3 TOURISM VALUES 20
3.4 OTHER VALUES ASSOCIATED WITH CHANGED LAND USE 22
3.5 EMPLOYMENT IN THE FOREST SECTOR 23

4 THE IMPACT OF SUGAR GROWING ON BUGOMA CFR AND ITS ECOLOGICAL VALUES (BIODIVERSITY, ECOSYSTEMS GOODS AND SERVICES) AND ITS ECONOMIC VALUE AND POTENTIAL. **24**

4.1 IMPACT ON ECOLOGICAL VALUES 24
4.2 IMPACT ON SOCIAL AND ECONOMIC VALUES 25

5 SHORTCOMINGS IN THE ESIS PROCESS AND APPROVAL PROCEDURES. **27**

5.1 THE ENVIRONMENT AND SOCIAL IMPACT STATEMENT REPORT (ESIS) 27
5.2 THE ESIA CERTIFICATE APPROVAL PROCESS AND CONDITIONS (CERTIFICATE NEMA/ESIA/13079) 29

6 ANNEXES **30**

6.1 ANNEX 1: LITERATURE REVIEWED 30
6.2 ANNEX 2: BASELINE INFORMATION ON BUGOMA CFR 31

List of Tables

Table 2.1: Management blocks of Bugoma CFR 8
Table 2.2: Project components 12
Table 2.3: Frameworks for managing Bugoma CFR 14
Table 2.4: Frameworks for EIAs 16
Table 3.1 summary of the economic contribution of Bugoma currently. 20
Table 3.2 Logs sold from Bugoma between 1995-1997 20
Table 3.3: Expected revenues for 5years. 22
Table 3.4: Tourism contribution to the economy 22
Table 3.5: Other forest values from Bugoma 22
Table 5.1: Assessment of mitigation measures 28

List of Figures

Figure 2-1: Management blocks of Bugoma CFR 9
Figure 2-2: Location of Bugoma CFR and adjacent landscape 9
Figure 2-3: Location of proposed area for sugar cane growing in relation to Bugoma CFR 12
Figure 2-4: Approved land use plan for Hoima Sugar Limited 13
Figure 3-1: Forest contribution to GDP 20
Figure 3-2 Forest jobs creation over time. 23

ACRONYMS

CBD	Convention on Biological Diversity
CFR	Central Forest Reserve
CSO	Civil Society Organizations
ESIA	Environment and Social Impact Assessment
ESIS	Environment and Social Impact Statement
HWC	Human Wildlife Conflicts
HSL	Hoima Sugar Limited
FMP	Forest Management Plan
GHG	Green House Gases
NAPE	National Association of Professional Environmentalists
NEMA	National Environment Authority
NFA	National Forestry Authority
NFCMP	National Forest Conservation Master Plan
NGO	Non-Government Organizations
TEV	Total Economic Value
UNFCCC	United Nations Framework Convention on Climate Change
UWA	Ugandan Wildlife Authority

GLOSSARY

For purpose of this document, the following definitions shall apply.

a. **Economic Loss:** the **financial loss suffered by a party that is caused through a web of economic relationships in which the party is involved**. In the case of Bugoma Central Forest Reserve (CFR) it entails loss of forest values that affects the economic returns from the CFR e.g., loss of employment opportunity, loss of revenues from nature based tourism, loss of access and use of forest products for economic gains, loss of economic opportunities that harness the economic value of forest services such as biodiversity, water, etc. It also encompasses the loss inflicted on individual investments such as crop raiding by forest based wildlife.

b. **Ecological loss:** the loss or decrease of ecological values and benefits accruing from Bugoma CFR in form of biodiversity and other ecosystem goods and services e.g., water, climate amelioration, etc.

c. **Values:**

- **Economic value:**value of the forest tangible and intangible resources for the human wellbeing or values that subsidize the cost of wellbeing to humans. In case of Bugoma CFR, it entailseconomic and social benefits for instance through employment, value generated from processing and trading in forest products, revenues from tourism, among others.
- **Social Value:** is a value created when resources, inputs, processes or policies are combined to generate improvements in the lives of individuals or society as a whole. In case of Bugoma CFR, they encompass inclusionand accessto forest resources by individuals or community. Social value also includes making use of forest resources for social good e.g., existence value (i.e., non-use values… value of knowing that Bugoma forest exists in a particular state even though there is no sensory contact with the resources therein.) attached to Bugoma CFR by individuals and host communities. Social value also encompasses cultural attributes.
- **Social Loss**: t**he social cost imposed by a monopoly.** In case of Bugoma, it entails the net economic burden that a monopoly of sugar cane growing displacing natural forests imposes on the public. In this case, sugar growing will increases its profits to the company whilst imposing a social cost on individual and community because there is less of the forest good available.
- **Ecological values**: the level of benefits that the space. water, minerals, biota, and all other factors that make up natural ecosystems provide to support native life forms.
  Ecological values can accrue to both humans and nonhumans alike. In the case of Bugoma CFR, these values entail biodiversity, water, carbon skink, etc. that are derived from the forest.

1. INTRODUCTION

1.1 The report

This report presents information on the ***Analysis of the socio-economic and ecological values of Bugoma forest in Buhanguzi County, Kikuube District***

The report provides information on: i) threat to Bugoma forest; ii) baseline information on Bugoma CFR and associated landscape; iii) policy, legal and institutional framework for the protection and management of Bugoma CFR; iv) economic benefits in present forest state; v) likely impact of conversion of Bugoma forest into sugar cane growing; and, vi) Shortcomings in the ESIS study and the ESIA approval process.

1.2 The problem addressed by the assessment

The assessment focuses on the problem identified by NAPE which is "**loss**" of Bugoma forest cover and associated values and benefits due to approved conversion of portion of Bugoma forest land into Sugar cane growing by Hoima Sugar Limited. This problem is noted to arise from:

a. **Changing land use:** Approximately 3,356.7791 ha of the forest and its associated landscape around Bugoma Central Forest Reserve which includes the woodland, forest and human settlements, are being contested by Hoima Sugar Ltd, Bunyoro Kingdom and National Forest Authority (NFA).

Area covered by Project components

The area coverage under the Project_Components is as follows:

(a) Sugarcane Plantation (9.24 sq. miles / 2,393.8483 ha);

(b) Urban Centre (1.206 sq. miles / 312.3 ha);

(a) Eco-tourism Uses: Eco-tourism Centre (1.97 sq. miles / 510.2277 ha); Cultural Site (0.156 sq. miles / 40.4038 ha); and, the natural reserved forest and nature walk-ways/trails (6.17 sq. miles / 1598.023 ha).

(b) Degraded areas for restoration (3.13 sq. miles / 810.663 ha).

Source: ESIA Certificate (14 August 2020)

The non-state actors, mainly Civil Society Organizations, Private Sector players in tourism, Communities around Bugoma and national and foreign conservation minded individuals have also contested the decision to convert natural environment into sugar cane growing in form of plantation. Other conservation agencies such as UWA have expressed concern about the impact of changing the land use for sugar cane plantation on biodiversity and related ecosystem services.

b. **Ownership of the targeted land:** In addition to changing land use, there is contested legality of the ownership of the 5,579 ha of targeted land between NFA and Bunyoro Kingdom. In 2016, NFA brought a case against Bunyoro Kingdom and Hoima Sugar Ltd challenging the legality of the title issued extending into Bugoma CFR. In April 2019, the court ruled that the land title was legally issued and that this land belongs to Bunyoro Kingdom. The ruling however, observes that there are no clear boundaries to determine whether all or part of the targeted land for sugar cane growing fall within the Bugoma CFR.

c. **Legality of the EIA certificate issued by NEMA to permit establishment of approximately 6,000ha of sugar plantation on the contested land.** In August 2020, NEMA later issued a certificate of approval of the ESIA to Hoima Sugar Ltd (Certificate No: NEMA/ESIA/ 13709 permitting it to start activities on the contested forest land. The legality of the EIA certificate is being contested on grounds that the procedures for approving the ESIA did not fully comply with the EIA Regulations.

1.3 The Study methodology

The study applied the following methodology/tools.

Total Economic value(TEV): this method was preferred since Bugoma forest and surrounding landscape is complex and provides a wide range of direct and indirect benefits that would be valued. The TEV tool accounts for the use and non-use values of the forest encompassing direct, indirect, options and existence values of Bugoma forest. The TEV generates the understanding of the extent to which the Sugar cane growing project attributes (both positive and negative) bear on management and opportunities costs for the Bugoma Central Forest Reserve. In this regards, TEV focused on the direct costs and benefits due to the change in the land use and assessed:

a. Over-all development objective and specific project objectives vis a vis forest protection/conservation.
b. Costs of change land use versus conservation of Bugoma CFR and associated natural ecosystems that will be affected by the change in land use (section 3.2)
c. Value of sugarcane on 5,776 ha.
d. Value of forest on 5,776 ha (basing on hard wood and Tourism) Section 3.2)
e. Cost of loss of the 5,776ha forest due to other offsite values (ecosystem and services) associated with Bugoma forest (Section 4).

Policy analysis of the "Short-circuits" in the ESIS findings and conclusions, the ESIA approval process and enforcement of ESIA approval conditions. This analysis aimed at generating policy level issues that qualify/disqualify the legality of the EIA certificate**.** The analysis also generates an understanding of the policy implications (positive and negative) on development planning and ESIS/EIA processes.

2. BASELINE INFORMATION

The following section highlights the baseline information about Bugoma Forest and surrounding landscape, Hoima Sugar Limited, Sugar cane growing project as well as policy and legal frameworks pertaining to Bugoma forest area and EIAs.

2.1 The Bugoma Forest landscape

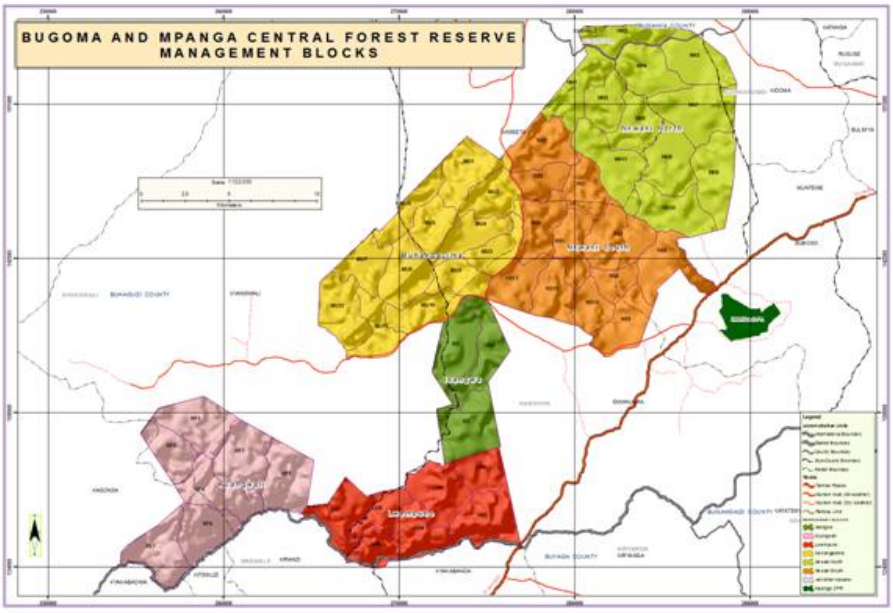
Bugoma landscape is comprised of the following key components:

2.1.1 The Bugoma Central Forest Reserve

Location: Bugoma Central Forest Reserve (CFR) covering 41,144 ha is situated in Buhaguzi and Bugahya Counties, Kikuube District. It lies to the East of Hoima-Fort -Portal road approximately 43 km from Hoima Town. The reserve is divided into 6 blocks that include Nkwaki North, Nkwaki South, Muhangaizima, Isangwe, Rwempunu and Kyangwali. Its geographical location lies between latitude 1°07' and 1°25'N and; between longitudes 30° 48' and 31° 07 E. (Table 2-1 and Figure 2-1).

Table 2.1: Management blocks of Bugoma CFR

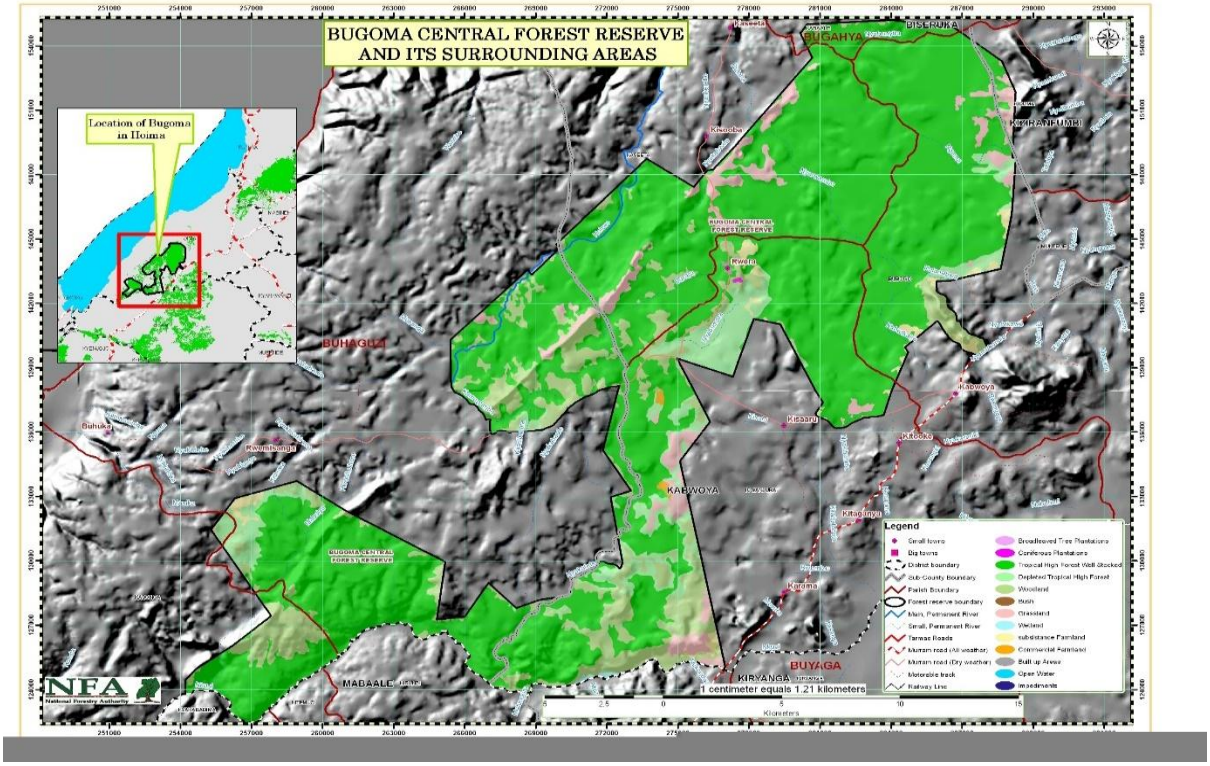
CFR	BLOCK	AREA (Ha)
Bugoma	Nkwaki north	9,780.38
	Nkwaki south	8,587.54
	Rwempunu	5,051.58
	Isangwe	2,882,28
	Kyangwali	6,241.87
	Muhangaizima	8,418.65
	Total	41,144.00
Source: Bugoma FMP (2013)		



Source: Bugoma FMP (2013)

Figure 2-1: Management blocks of Bugoma CFR

The boundary length of the reserve is 176.25 km of which 131.45 km is a cut line and 44.8 km, of natural features (i.e.10 km along roads and 34.8 km along rivers) (Figure 2-2)



Source: Bugoma FMP (2013)

Figure 2-2: Location of Bugoma CFR and adjacent landscape

2.1.1.2 Legal Status

Bugoma CFR was first gazetted under Legal Notice No. 87 of 1932 as an un-demarcated forest reserve of 35,840 ha and included the forested areas of Nkwaki, Isangwe, Muhangaizima, Rwempunu, Kyangwali, Nyabukanka, Nguse-Bugaya (now Kibale district).

Under legal notice No. 251 of l944 the area was increased to 43,520 Ha and names of the constituent parts deleted. In the First Schedule to Legal Notice No.41 of 1948, the forest is recorded as No. 181 and as an un-demarcated production forest in Bunyoro District (now Hoima District) in Buhaguzi County. It is currently gazetted by Statutory Instrument No. 63 of 1998 with an area of 41,144 Ha.

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2.1.1.3 Management objectives

According to the Bugoma Forest Management Plan (FMP) (2013-2023), management of Bugoma CFR envisioned" A ***sustainably managed forest ecosystem in the Albertine Rift providing adequate socio-economic and environment benefits to the population"***. The FMP aims at ***Improving the sustainable management of Bugoma Central Forest Reserves with the integration of forest adjacent local community in management as a key pillar in the ecological and socio-economic growth and development in Kikuube District***, through long-term (20-30yrs) and Immediate objectives (5-10) as follows:

Long term (20-30yrs): To significantly improve management of Bugoma CFR and increase the forest based livelihood benefits of the local community adjacent to the forest reserves with a sustainable flow of products and services in an environmentally friendly manner.

Immediate Objectives (5-10 yrs): To conserve "in-situ" forest biodiversity and ecological conditions.

a. To produce economically and sustainable hardwood timber and non-timber products.

b. To integrate local communities adjacent to the forest in participatory management of the forest reserve.

c. To promote commercial tree planting using quick growing species that will supply timber to supplement naturally growing trees.

d. To carry out research in order to obtain information on various aspects of forest ecosystem dynamics.

e. To develop recreational facilities for the people of Uganda and others.

The forest is divided into five management zone categories namely;

a. Forest Conservation area covering an area of 16,411.59 Ha (40%) of Bugoma, consisting of Kyangwali block and Compartments NN1, NN8, NN10, NS1, NS2, NS3, NS7, NS8, NN5, NN6, NN11 & NN9.

b. Forest Production area covering a forest area of 24,732.41 Ha (60%) in Bugoma CFR, consisting of Muhangaizima, Isangwe and Rwempunu blocks and grassland area of 320 Ha.

c. Community Integration and Education area including communities within the parishes adjacent to the CFR.

d. Recreation area consisting of compartments NS1, NS2 and NS3.

e. Research working area encompassing the entire forest through a pattern of Research Plots and Permanent Sample plots.

2.1.2 The Socio-economic and ecological values

2.1.2.1 Ecological values

According to the Bugoma FMP (2013), the ecological values include; i) Biodiversity; ii) Wood (timber, poles fuel wood, etc.) and other non-wood products (e.g., pasture, medicinal plants, mushrooms, etc.); iii) Catchment protection and associated forest ecosystem goods and services (water, weather modulation, carbon sink, etc.).

Bugoma CFR is a very well stocked forest as far as trees and other vegetation are concerned and serves a very big carbon store in the area/region since forests and trees absorb carbon dioxide gas

emission (CO_2) from the atmosphere. At the moment, Bugoma CFR serves as one of the major sink for GHGs that are likely to result from oil and gas activities in the Albertine graben.In Bugoma CFR, there are quite a good number of streams that supply the main rivers like Nguse which later drain into Lake Albert.

Note. Details are presented in Annex 6-2.

2.1.2.2 Socio-economic values

According to Bugoma FMP (2013), Bugoma forest supplies variety of forest products (Rattan canes for making chairs, baskets, tables, granaries etc.; Rashia palms for making mats, baskets and banning tobacco; Fuelwood and construction poles (communities and Kyangwali Refugee Settlement Scheme); Mushrooms, while ants for eating; Honey; Wild coffee and yams; Medicinal plants; Latex and Bamboo (in small quantities) and employment. Bugoma CFR is also a source of Employment to local people by NFA and private sector in tourism forest produce (stones, sand) and tourism attractions.

Note. Details are presented in Annex 6-2.

2.1.2.3 Indirect /intangible values/benefits

According to the Bugoma FMP (2013), the forest provides the following intangible benefits: i) Climate amelioration; ii) Existence values, and, iii) Safety net to effects of climate change (severe shortages of water, pasture, etc.)

2.2 The Hoima Sugar Limited and Sugar cane project

2.2.1 The Company

Hoima Sugar Limited (HSL) is a sugar manufacturer in Uganda, the third-largest economy in the East African Community.The company headquarters and factory are located on an 8,000 acres (32 km^2) estate in *Kiswaza Village*, Kiziranfumbi sub-county, Hoima District, approximately 31 kilometres (19 mi) southwest of Hoima. The coordinates of the factory are 1°15'09.0"N, 31°11'36.0"E (Latitude:1.252490; Longitude:31.193326).

The company is a medium-sized sugar manufacturer, established in 2016, with production capacity of 1,500 metric tonnes daily. The factory had signed up 450 out-growers as at May 2016, with that number expected to grow to 2,000 by 2017. The total work force at the company is projected to grow to 5,000, once all systems are operational. A thermal power co-generation facility is planned. The total investment is calculated at US$42 million.

The business is owned by Rai Holdings. The family-owned group has a 70 percent shareholding in Kinyara Sugar Works in neighboring Masindi District and also owns West Kenya Sugar Limited, and Sukari Industries both in Kenya.

The Sugar growing project: The US$ 20 million project Cost is United States Dollars Twenty Million (US $ 20, 000, 000).is to be implemented through 5 components (Table 2-2).

Table 2.2: Project components

No	Land Use / Component
1	Sugar Cane Plantation with the associated access roads, work camps (2,393.8483ha),
2	Eco-Tourism with the associated eco-lodge, camping sites, walk trails, cultural sites (1,598.023 ha)
3	Urban Centre with the associated educational institutions (primary school, secondary school, technical school, hospital), recreational areas, shops, churches, entertainment areas, waste water treatment areas, markets etc. (312.3 ha)
4	Buffer Areas to be established along rivers and adjacent Bugoma Central Forest Reserve (810.663 ha)
5	Forest Reserves; the moist tropical forests to be preserved in addition to replanting adjacent areas (that have been degraded) with indigenous trees

2.2.2 The threat posed by sugar cane growing by Hoima Sugar Ltd

Key threat: The key threat to Bugoma CFR is the **Conversion of approximately 5,579 ha of landscape into Sugar cane growing** (Figure 2-3). It is however, noted that the size of forest forming part of Bugoma CFRs will be determined after the court ruling on the boundaries of Bugoma CFR.

Source: ESIACertificate (2020)

Figure 2-3: Location of proposed area for sugar cane growing in relation to Bugoma CFR

Of this, approximately 1,295 ha is tropical forest while approximately 5,403 ha is woodland. Estimates for areas covered by wetlands is not captured. The proposed sugar cane growing will be established on approximately 3,108 ha (approximately 55% of project area) (Figure 2-4). Changing land use covering ng 3,108ha will significantly impact on the social-cultural and ecological values of Bugoma CFR and adjacent landscape.

Source: ESIA Approval Certificate (2020)

Figure 2-4: Approved land use plan for Hoima Sugar Limited

The ESIS (2020) identifies the following threats to Bugoma CFR.

a. Livestock grazing involved >30,000 heads of cattle due to loss of pastures in the woodlands area
b. Extending Charcoal production into the CFR
c. Extending Crop agriculture (mainly maize, beans and other crops) into the CFR
d. Timber logging
e. Loss of Cultural values associated with several cultural sites that will destroyed during sugar cane growing
f. Ancestral burial grounds that will be destroyed during sugar cane growing
g. Firewood gathering and acquisition of medicinal herbs will be extended to Bugoma CFR.

2.3 Policy and legalframeworks pertaining to Bugoma forest area and EIAs

2.3.1 Framework for Bugoma Forest

The following frameworks apply to the management of Bugoma CFR. (Table 2-3).

Table 2.3: Frameworks for managing Bugoma CFR

Framework	Provisions for protection and conservation of Bugoma CFR
The National Forestry Policy (2002)	a. Goal: An integrated forest sector that achieves sustainable increases in the economic, social and environmental benefits from forests and trees by all the people of Uganda, especially the poor and vulnerable b. Objectives 1: protect, maintain and sustainably manage the forest reserves on government land, with the intention of setting aside the reserves '...permanently for the conservation of biodiversity, the protection of environmental services, and the sustainable production of domestic and commercial forest produce. c. Objective 2: promoting the development and sustainable management of natural forests on private land. d. Objective 5: develop collaborative partnerships with rural communities for the sustainable management of forests, through collaborative forest management (CFM). e. Objective 7: promote conservation and management of Uganda's forest biodiversity in support of local and national socio-economic development and international obligations.
Environment Policy (2014)	Goal: sustainable development which maintains and promotes environmental quality and resource productivity for socio-economic transformation. Objectives: With respect to forestry resources, the policy objectives are to achieve sustainable increase in the economic, social and environmental benefits from forests and trees by all the people of Uganda, especially the poor and vulnerable; to sustainably manage forest and forest resources in protected areas, public and private land; and to promote increased forest production by the private sector and communities. The policy calls for the establishment of an *environmental appeals tribunal* to handle disputes related to the environment.
The Wildlife Policy (2014)	Goal: conserve wildlife resources of Uganda in a manner that contributes to the sustainable development of the nation and the well-being of its people. The policy imposes a responsibility on NFA to manage wildlife that is found in forest reserves under its jurisdiction under technical guidance of UWA. The policy imposes responsibility on local governments to be in charge of management of wildlife that is found in areas outside protected areas under district jurisdiction including private lands.
The Land Policy (1997)	The Land policy provides for: a. ensuring that the operations of land tribunals are devoid of technical procedures and litigation technicalities usually associated with ordinary courts. b. clear rules for the application of the law by Land Tribunals; provide room for the application of traditional and indigenous principles in the resolution of land dispute c. recognizing and institutionalizing traditional mechanisms for the resolution of land disputes as mechanisms

	d. providing clear hierarchy of dispute resolution mechanisms and levels of appeal e. free legal services to vulnerable sections of society f. encourage and build capacity for alternative dispute resolution as well as the application of principles of natural justice.
The Constitution (1995; amended 2015)	Under *Objective Principle Number XXVII of the National Objectives and Directive Principles of State Policy* of the Constitution, Uganda is obliged to promote sustainable development and public awareness of the need to manage land, air and water resources in a balanced and sustainable manner for the present and future generations. The utilisation of the natural resources of Uganda is to be managed in such a way so as to meet the development and environmental needs of present and future generations of Ugandans. Uganda is obliged to take all possible measures to prevent or minimise damage and destruction to land, air and water resources resulting from pollution or other causes. Uganda is under an obligation to promote and implement energy policies that will ensure that people's basic needs and those of environmental preservation are met. Uganda is obliged to create and develop parks, reserves and recreation areas and ensure the conservation of natural resources; and promote the rational use of natural resources so as to safeguard and protect the biodiversity of Uganda. Under *Article 39* of the Constitution, every Ugandan has a right to a clean and health environment. Under Article 245 of the Constitution, Parliament shall, by law, provide for measures intended; to protect and preserve the environment from abuse, pollution and degradation; to manage the environment for sustainable development; and to promote environmental awareness.
The National Forestry and Tree Planting Act (8/2003)	*Section 2* of the Act sets out the purposes of the Act including the creation of "an integrated forest sector that will facilitate the achievement of sustainable increases in economic, social and environmental benefits from forests and trees by all the people of Uganda." *Section 4* of the Act classifies forests into the following five categories: a. central forest reserves; b. local forest reserves; c. community forests; d. private forests; and e. forests forming part of a wildlife conservation area declared under the Uganda Wildlife Act (2019). *Section 13(3)* of the Act provides that a forest reserve shall be managed in accordance with generally accepted principles of forest management as may be prescribed in guidelines issued by the Minister. Under *Section 14(1)* of the Act, it is prohibited for any person to cut, disturb, damage, burn or destroy any forest produce, or remove or receive any forest produce from a forest reserve except as may be permitted by the law. *Section 15* of the Act gives legal recognition to collaborative forest management, and in this respect, a responsible body may enter into a collaborative forest management arrangement with a forest user group for the purpose of managing a central or local forest reserve or part of it in accordance with regulations or guidelines issued by the Minister. *Section 25* of the Act provides that a traditional or cultural institution or leader may hold, own or manage a forest, subject to directions as may be issued by the responsible Minister. Under *Section 27(1)* of the Act, government or a local government has no ownership over trees or forest produce situated on private land. However, under *Section 27(2)* of the Act,

	a district forest officer may issue directions to the owner of trees or forest produce situated on private land, requiring the owner to manage the trees or forest produce in a professional and sustainable manner. *Section 28* of the Act provides for the development of management plans in respect of forest reserves or community forests in consultation with the community. Once a management plan is agreed, it shall be binding upon all persons having interests and dealings in the forest. It is mandatory for all forest reserves under the Act to have management plans within one year of the coming into force of the Act (*Section 28(7) of the Act*). *Section 29* of the Act provides for Uganda's sovereignty over biological resources within the forest. It provides that all forest biological resources and their derivatives, whether naturally occurring or naturalised within a forest, shall be conserved and managed for the benefit of the people of Uganda. The transfer of any forest biological resources and their derivatives from the territorial jurisdiction of Uganda shall not diminish or extinguish the sovereignty of Uganda over those resources. *Section 46* of the Act provides that the Minister responsible for forestry shall be responsible for: policy formulation and planning; and ensuring the implementation of functions connected with the implementation of the forestry policy, the National Forest Plan and the Act. *Section 5(2)* of the Act empowers any person or responsible body to bring an action against a person whose actions or omissions have had or are likely to have a significant impact on a forest; or for the protection of a forest. Under *Section 38* of the Act, a person intending to undertake a project or activity which may or is likely to have a significant impact on a forest shall undertake an environmental impact assessment.
Environment Act (2019)	Schedule 5 to the Act provides that forestry projects are listed among those that require mandatory environmental and social impact assessments (ESIA). Activities that require ESIA include gazetting or degazetting of forest reserves; conversion of forested land to other land uses within catchments and watersheds; introduction of new tree species; commercial charcoal production; extraction of rubber and resins; and establishment of plantations of more than 500 ha. In Schedule 10 to the Act, projects planned to be located in or near environmentally sensitive areas such as community forests, forests in former public land and private forests require environmental and social impact assessments.

The Assessment concludes that the approval to change land use of portions of forests falling within Bugoma CFR violates some of the provisions highlighted above. Specific details are presented in section 5.1.

2.3.2 Frame works for EIAs

The approval procures for the ESIS and issuance of ESIA Certificates is required to comply with the provision in the following Laws and Regulations (Table 2-4).

Table 2.4: Frameworks for EIAs

Laws
• **The Uganda Constitution (1995), amended 2005** • **The National Environment Act (2019) …use old Version of 2019** • **The National Environment (Waste Management). S.I No. 153-2** • **The National Environment (Delegation of Waste Discharge Functions). S.I No. 153-4**

- **The National Environment (Standards for Discharge of Effluent into Water or on Land) Regulations, S.I. No 153-3**
- **The National Environment (Wetlands, River Banks and Lake Shores Management) Regulation; S.1 No 153-5**
- **The National Environment (Noise Standards and Control) Regulations. S.1 No. 30/2003**
- **The National Environment (Environmental Impact Assessment) Regulation[1] S.1 No. 153-1**
- **The Water Resources Regulation SI No. S.1. No 152-1**
- **The Water (Waste Discharge) Regulation SI No. 152-4**
- **The National Environment (Mountainous and Hilly Areas Management) Regulations. S.1 No. 153-6.**
- **The Environment (Audit) Regulations. S.1 12/2006**
- **The Land Act (1998)**
- **The Roads Act 1964**
- **The Town and Country Planning Act 1964**
- **The Public Health Act**
- **The Water Act (1995)**
- **The Local Governments Act, 1997**
- **Occupational safety and Health Act, 2006**
- **The Penal Code Act cap.120**
- **The Investment Code of 1991**
- **The National Forestry and Tree Planting Act (2003)**
- **The Wildlife Act (1999)**
- **Control of Agricultural Chemicals Act Cap 28**
- **Prohibition of burning of Grass Act cap 33**
- **The Fishing Act Cap 197**

The Assessment found out that whereas these instruments are cited in the ESIS, there are shortcomings as highlighted in section 5.1).

2.3.3 International Policy

The following provisions in the International policy framework apply to management of Bugoma CFR.

Policy/Instrument	Provisions
Treaty for the Establishment of the East African Community (1999)	Article 111 provides for environmental issues and natural resources. Article 111 (2) (c) requires States to ensure sustainable utilisation of natural resources such as lakes, wetlands, forests and other aquatic and terrestrial ecosystems. Article 114 (2) (a) sets out actions that States shall take to ensure conservation and management of forests including the adoption of common policies for the development, conservation and management of natural forests, commercial plantations and natural reserves; and joint utilisation of forestry training and research facilities.
East African Community Protocol on Environment and Natural Resources (2006)	Article 11(a) of the Protocol provides that Partner States shall co-operate in all activities relating to development, conservation, sustainable management and utilisation of all types of forests, trees, and trade in forest products throughout the community.
Paris Agreement	Article 5(2) of the Paris Agreement provides for national action to reduce emissions from deforestation and forest degradation
Sustainable Development Goals	

[1]Revised in December 2020

Convention on Biological Diversity	*Article 1* sets out the main objectives of the Convention, which include: the conservation of biological diversity; the sustainable use of its components; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. *Article 6* sets out the general conservation measures to be implemented by the Parties, including the following: developing national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt existing strategies, plans or programmes; integration of the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies. *Article 11* requires each contracting Party to adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity.
Convention to Combat Desertification	*Article 8* describes the content of national action programmes to ensure integrated and sustainable management of natural resources, including: agricultural land and pastoral land; vegetation cover and wildlife; forests; water resources; and biological diversity.
Universal Declaration of Human Rights (1948)	Article 1 provides that all human beings are born free and equal in dignity and rights. Article 3 provides that everyone has the right to life, liberty and security of person. Article 5 provides that no one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment. Article 17 provides that everyone has the right to own property alone as well as in association with others. Article 19 provides that everyone has the right to freedom of opinion and expression including the right of freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers.

The Assessment concludes that whereas the provisions in the above policy framework are not obligatory to Uganda, the decision to change land use of portions of forest within Bugoma CFR, demonstrates Uganda's failure to honour its obligations to its commitment to international cooperation on these matters. This poses a possible constraint to Uganda's opportunities benefit from this cooperation in form of technical and financial support for biodiversity conservation, natural resources management and climate change mitigation, among others.

3 THE ECONOMIC BENEFITS TOUGANDA GOVERNMENT

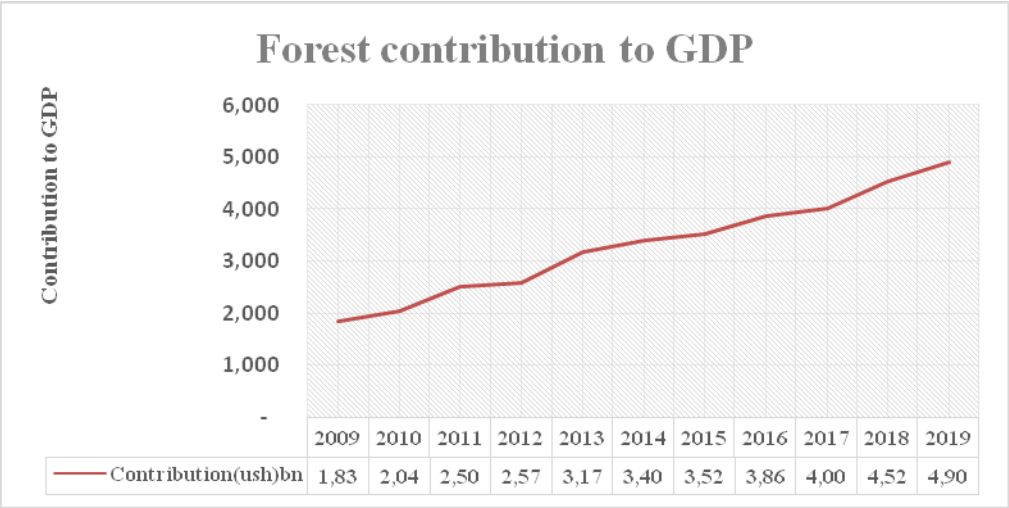
3.1 Overview of economic value of forests at macro-level

The total estimated economic value (marketable and non-marketable values) of Uganda's forests at UGX 593.24 billion (USD 300 million). However, the estimation of the contribution of forests to the national economy in Uganda still presents both conceptual and methodological challenges. In general, it is believed that the contribution of forests is routinely underestimated. Some of the challenges in forest evaluation include:

(i) Forests produce multiple products that make it difficult to assign values to some of the products.
(ii) Forests produce many non-market products and services. Forests have provided safety nets against shortages of food, fuel, income and against ill-health, especially during times of natural or economic shocks that perpetuate vulnerability and poverty.
(iii) Timber and some other forest products result from biological processes that take a very long time to realize.[2]

The study to determine the economic value of forest resources in Uganda (Total Economic value –TEV) and their contribution to the national economy that was conducted by the National Environment Management Authority (NEMA), between October 2010 and May 2011, projected that the monetary accounts for the forestry resource flows in Uganda based on conservative estimates, was approximately US$ 1,277 million in 2010 equivalent to Ushs 2,960 billion. When compared with the GDP (2009) at current prices of Ushs 34,166 billion, the forestry sector was equivalent to 8.7% of that amount.

In 2019, forestry sector's contribution to the Gross Domestic Product (GDP) by economic activity at Current prices was estimated at UGX 490 billion (Figure 3-1). Based on this, the percentage share of GDP made by the forestry sector was 3.8%. The trends for the Period 2009 – 2019 are shown in Figure 3-1.



Source: UBOS Statistics-Rebased

[2]National Forest plan 2013.

Figure 3-1: Forest contribution to GDP

Whereas the total Economic value of Bugoma CFR has not been captured due to inadequate data, the management objectives stipulate din the 2013-2023 Forest Management Plan (Section 2.1.1.3) indicate that achieving the management objectives yields high returns in form of Biomass/wood value, tourism revenues and community benefits from the other forest ecosystem goods and services. Over-all, reduced returns will affect Bugoma forest contribution to national GDP.

3.2 Foregone values of Bugoma CFR in favour sugar cane

The current forest economic activities that will be foregone in favour of sugar cane production is approximately UShs 2.96 billion (Equivalent to US$ 1.276m) per year (Table 3-1). The loss of these values will be a huge cost to the nation and community in terms of household incomes and enterprises lost.

Table 3.1 summary of the economic contribution of Bugoma currently.

S/N	Economic products, services, management and regulatory components	Value in million UGX	Value US$M	% of total
1.	Forested Land	741,984.04	321.4	25.17%
2.	Timber flows recorded in Statistical	258,955.66	112.17	8.78%
3.	Other Timber Trade Exports	9,430.63	4.09	0.32%
4.	Less Other Timber Trade Imports	-8,421.77	-3.65	-0.29%
5.	Non-Wood Forest Products	65,224.40	22.14	1.73%
6.	Carbon Sequestration Service	627,939.20	272	21.30%
7.	Biodiversity Conservation Service	357,371.30	154.8	12.12%
8.	Recreational Services(Ecotourism)	182,726.58	79.15	6.20%
9.	Soil protection Services	670,794.00	291	22.79%
10.	Forestry Management,	54,873.56	23.85	1.87%
	Total Contribution of Sub-Sector	2,960,877.60	1,276.95	100.00%

Source: NFA

According to National Forest Plan (2013), 50,000$m^3$of timber are harvested annually from TFM of central forest reserves according to SFM guidelines while 10,000 ha of woodlands are harvested for sustainable charcoal production annually. *Note: these estimates are not segregated per CFR, hence, the estimates for Bugoma CFR are not presented in this report.*

The Bugoma forest is an important potential source of sawn timber with timber production potential being 25m^3/ha for trees exceeding 50 cm dbh. The extraction of round wood by pit-sawyers between 1995-1997 amounted to 651.497 m^3 (Table 3-2).

Table 3.2 Logs sold from Bugoma between 1995-1997

YEAR	CLASS I (M3)	CLASS II (M3)	CLASS III (M3)	TOTAL (M3)
1995	7.928	-	-	**7.928**
1996	52.733	58.972	457.102	**568.807**
1997	26.058	48.74	-	**74.672**
Total	**86.719**	**107.676**	**457.102**	**651.497**

3.3 Tourism values

The tourism value of Bugoma is estimated at an average of UShs 171.2 billion (equivalent $ 46.29 million/year) Table 3.3).

Table 3.3: Expected revenues for 5years.

Project Year	0	1	2	3	4	5	6	7	8	9	10
Investment Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Growth Rate (10%/annum)	0	2	5	10	10	10	10	10	10	10	10
Projected Revenue (Accommodation &Entrance)	0	40	44	48.4	53.2	58.6	64.4	70.9	77.9	85.7	94.3
10% Depreciation	0	0	4.4	4.8	5.3	5.9	6.4	7.1	7.8	8.6	9.4
VAT (18%)	0	7.2	7.9	8.7	9.6	10.5	11.6	12.8	14	15.4	17
Net Revenue	0	32.8	31.7	34.8	38.3	42.2	46.4	51	56.1	61.7	67.9

The main tourist attractions in Bugoma are the cultural and historical assets (e.g., the Old Karwata fort site), bird watching, primate views/chimpanzee tracking, nature/forest walks, among others.

Bugoma forest is a sanctuary of many tourist attractions that currently contribute to the GDP as well as employment generation to the country. Changing land use to sugar cane growing will deprive the economy wide contribution from tourism and employment of local community currently benefitting from the tourist economic activities (Table 3.4).

Table 3.4: Tourism contribution to the economy

Indicator	
Tourism contribution to GDP	5.6%
Tourist international arrivals	1,150,000
Earnings from tourism(USD) millions	805
Employment in enterprises	484,000

Source: Tourism development master plan 2014-2024

3.4 Other values associated with changed land use

The current land use in the targeted area for sugar cane growing is not restricted to one enterprise as seen in 3.5 above.

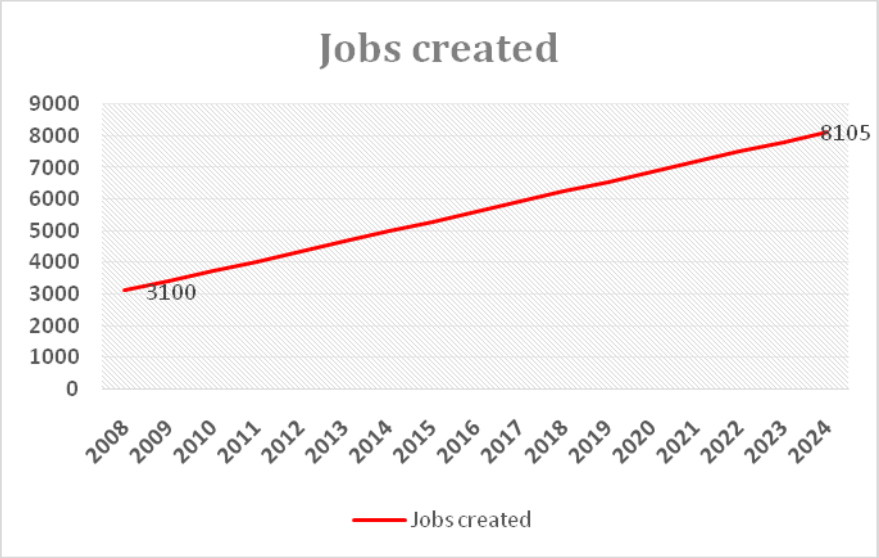
Table 3.5: Other forest values from Bugoma

Timber	Non –timber products	Ecosystem services/goods	Tourism services
• **Construction**	• Charcoal • Fuel wood • Wild edible plants and fruits • Craft materials • Medicinal plants • Honey	• Water • Climate modulation • Carbon sink	• Forest entry fees • Guiding fees • Permits • Hospitality • Food crops • Employment

Numbers of enterprises ranging from Agricultural enterprises, tourism and forestry enterprises are contributing significant household incomes to the local community. This is compared to only one enterprises in the case of Sugarcane growing. There is need therefore quantify and value the economic activities in this area compared to sugarcane growing. This shift in land use will not create the jobs for all the population in the area as envisaged. Changing the Bugoma land use will deprive local community of both direct and employment they derive currently from the forest as indicated above.

3.5 Employment in the Forest Sector

The forest sector is an important employer in Uganda, especially in rural areas. The Government estimates that the forest sector employs about 1 million people. 100,000 of these are employed in the formal sector (Forest Policy 2001). During the period 2004-2007, 21,000 ha of plantation has been established leading to an additional 10,000 permanent jobs & another 15.000-part time jobs, which translates into UGX 20 billion (USD 12.1 million) (Kaggwa, R; Hogan, R. and Hall, B (2009a).



Source: National forestry Plan

Figure 3-2Forest jobs creation over time.

Future trends show that employment in the forestry sector is going to increase considerably in the area of plantation establishment. By 2025, about 100,000 jobs will have been created figure2 above

The current land use provides the diversity of employment ranging from timber harvesting and trading to local craft the enterprises that are operated by the local population of Bugoma forest reserve.

4 THE IMPACT OF SUGAR GROWING ON BUGOMA CFR AND ITS ECOLOGICAL VALUES (BIODIVERSITY, ECOSYSTEMS GOODS AND SERVICES) AND ITS ECONOMIC VALUE AND POTENTIAL.

According to the Hoima Sugar Ltd Environmental Impact Statement (2020), a number of environmental and social impacts will result from the establishment of this mixed use project Section 3 of the SIS Report). The ESIS also identifies/recommends mitigation measures (Section 8 of the ESIS report).

The following are the major impacts of converting 5,776ha of forest and woodland on Bugoma CFR. and its ecological values. These impacts are expressed in qualitative terms while quantitative estimates of economic values that would be lost are expressed in section 3 of this report.

4.1 Impact on ecological values

Loss of biodiversity of both plants and animals (including insects) will lose life while some of the plants and animals will be displaced due to loss of natural habitats that house them. Bugoma is a core conservation forest according to the National Forest Conservation Master Plan (NFCMP) (2000). Of the 65 forests investigated for biodiversity, Bugoma ranks 12th in overall importance with a score of 14.1. It is among the large tropical high forest reserves of western Uganda. In terms of species diversity, it ranks 12th, but ranks 17th in terms of species rarity value. This is probably because it shares most of its species with the large forest found in no other forest in Uganda (including 7 species of butterflies and 2 species large moths). One species of Mammal is endemic to Uganda and one species (butterfly) is endemic to Albertine Rift.

The conversion of 5,776ha into sugar cane plantation will involve cutting down and disposing off the trees and vegetation mainly through burning them into Charcoal or ash. It is will result into loss of some species (e.g., baboons) whose location, especially the woodlands, will restrictin their home range. Some animals (small mammal, reptiles, etc.) will be killed in the process. The land converted to sugar cane displaces biodiversity from its home range thereby subjecting these ranging biodiversity to compete for remaining forage and prey within the forest, as well as breeding or mating grounds. There is likely to emerge an increase in the Human Wildlife Conflicts (HWC) associated with crop raiding by monkeys, baboons, etc. due to this displacement. Collectively, these impacts will stress the wildlife with potential effect on their breeding. Below ground biodiversity will be affected by use of agrochemicals and fertilizers and thus incurably undermining natural soil nutrient enrichment cycles. The use of agrochemicals will also affect pollinators (e.g. bees) which are highly susceptible to pollution. This will result in loss of their pollinator function as well as honey production.

Carbon sink: The process of burning trees and vegetation and later tilling the land for cane growing will generated the GHG (Co_2) that hitherto has been stored in these plants and in the soils, thus exacerbating the contribution of Uganda towards GHG that influence climate change over-all. According to NFA (2017), the major source of Co_2 in Uganda is burning biomass.

Bugoma CFR is a very well stocked forest as far as trees and other vegetation are concerned. It is therefore a very big carbon store in the area/region. Bugoma CFR, therefore plays a vital role as a carbon sink considering gases absorbed (tonnes/ha), thus reducing the ozone layer depletion and global warming. At the moment, Bugoma CFR serves as one of the potential major sink for GHGs that are likely to result from oil and gas activities in the Albertine graben. Hitherto, Bugoma forest is

among the priority in the Oil region whose function to sequestrate GHG emissions that will be generated from the Oil production has been profiled during the assessment of impact of Oil activity on environment whereby Bugoma forest, among others, was considered as an "offset" to this impact[3].

Microclimate amelioration: The altitudinal range of Bugoma CFR ranges from 990m to 1,350m above sea level. This gives the topographic advantage over the adjacent landscapes, especially the rift valley and as such, Bugoma provides an amelioration of weather in the region. Bugoma forest forms part of transition from the tropical forest towards the savannah woodlands/grasslands of the Albertine Rift valley.

Hydrological values: Bugoma is a Catchment protection forest out of which drains water that supports wildlife in Kabwoya Wildlife Reserve, communities along rivers Nkuse (Nguse), Rutowa, Howa and Rwemiseke, wetlands and eventually fisheries in L Albert. This value will be very instrumental in recharging waters of Lake Albert during the Oil production /oil refineries.

Increasing threat to Bugoma: by displacing ecological, social and economic values from the 5,579 ha of land that will be converted to sugar cane growing, it will result into transfer to these uses and values to the remaining portion of Bugoma forest. Resources such as firewood and pasture will be sought from remaining portion of Bugoma forest. The planned network of access roads will ultimately expose Bugoma forest and increase access to forest resources.

4.2 Impact on Social and economic Values

The impacts on social and economic values is intertwined due to the complex socio-economic and cultural factors that support or influence livelihoods, local economies and over-all, social wellbeing of the people living in the landscape housing Bugoma forests. As indicated in section 2, Bugoma Forest provides host of social and economic values to immediate and distant inhabitants in the landscape housing the Bugoma Forest. The following values will be significantly impacted by the conversion of 5,579 ha of forest land to sugar cane growing.

Water as a resource: will decline in quality and quantity and reliability. The water quality will be compromised by both loss of soils protection by forest and the natural vegetation (hence preventing/minimising soils erosion and water sedimentation), increased soil wash and sedimentation from deforested land and deposition of extra nutrients and chemicals arising from fertilizer and agrochemical applications in sugar cane growing. These events will be exacerbated by loss of wetlands that would serve as filters of such undesired water constituents. The Bugoma forest or catchment will have its water storage capacity reduced which will result in low volumes of water (quantity) and much lesser quantities during the dry season. River Howa and Rwemiseke have already experienced significant fall in quantities of water during the dry season and this trend will be worse after converting the remaining portions of the forests for sugar cane growing.

Biomass for domestic energy use and other wood uses: will significantly reduce when sugar cane substitutes the woodlands and portions of the forest that will be converted to sugar cane growing. This has serious consequence on the availability and affordability of wood fuel to the majority (nearly 100%) of households and commercial activities that depend on wood for fuel, in the immediate and medium term. Wood shortage will not only exert more pressure on Bugoma forest, it will also increase the burden on women and girl child whose gender role in providing cooked food to the family will be severely constrained. Other wood uses such as converting wood into household/domestic tools (e.g., hoe handles, pestle, pounding mortars, stools, etc.) and craft materials will be lost.

[3] EACOP ESIA (Jan 2019)

Pasture for livestock: the woodlands and forest edges have been key sources of pasture for livestock (cattle, sheep and goats). The inhabitants have strong attachment to keeping livestock as social symbol, source of wealth and economic security. By substituting the grazing land with sugar cane, communities will be deprived of pasture and other social and economic values.

Food sovereignty: being the ability to determine the food will be compromised by displacing natural sources of vegetables, fruits, mushrooms and honey. The anticipated increase in revenues that would compel inhabitants who have lost access to these resources to a "cash economy" is not suitable options in light of the social and cultural background of the majority of the in-habitants.

Loss of or disruptions of cultural values: according to the ESIS (2020) Bugoma forest and adjacent woodland areas that are targeted for sugar cane growing have been providing significant cultural assets and values that will be displaced and therefore lost. The ESIS reports of assets such as burial grounds, spiritual assets and over-all existence value that will be lost. These values are irreplaceable as they are associated with the complex interaction between living and non-living elements housed within "sacred" places such as Bugoma forests.

Tourism: potential of Bugoma CFR may not be directly affected. The tourism attractions in Bugoma forest are best utilized under "eco-tourism" model which is very attractive to naturalists[4]. These comprise of bird watching, primate views/tracking, botanical /nature walks, However, there are long terms indirect effects that will accrue due to the negative publicity of the sugar cane growing that may turn-off such category of tourists.

[4] According to the Bugoma Forest Management Plan (2013-2023); the main tourist attracts in Bugoma include: Karwata Fort Site, birds, butterfly species and primates, especially, chimpanzees.

5 SHORTCOMINGS IN THE ESIA PROCESS AND APPROVAL PROCEDURES.

A review of the approved Project ESIS (August 2020) and the Environmental Impact Assessment Certificate No 13709 of 14th August 2020, identifies the following shortcomings and or flaws that need to be corrected.

5.1 The Environment and Social Impact Statement Report (ESIS)

The following shortcomings affect the credibility of the ESIS Report.

A: Inadequate assessment of Policy, legal and Institutional framework pertaining to the project: The ESIS conclusions and recommendations did not take into account provisions in the following frameworks:

i. The environmental implications and requirements assessment was based on the national Environment Act (1995) (section 2.3.1 of the ESIS document) whereas there was a new law – The National Environment Act (2019) that not only repealed the 1999 Act, introduces new environmental management standards and requirements that were therefore not considered. For example, the requirement for "offsetting" environment cost is not considered at all where as it applies to this type project.

ii. The following subsidiary policies, laws and regulations were not considered: The National Environment (Mountainous and Hilly Areas Management) Regulations. S.1 No. 153-6, The Environment (Audit) Regulations. S.1 12/2006; The Wildlife Act (1999); Control of Agricultural Chemicals Act Cap 28; Prohibition of burning of Grass Act cap 33 and The Fishing Act Cap 197. These omissions render the conclusions and recommendations of the ESIS deficient of the requirements of these instruments.

iii. The following international policy frameworks to which Uganda is a Signatory/party were not considered: The Paris Agreement; The Convention to Combat Desertification; The Sustainable Development Goals. Whereas the provisions of these instruments are not obligatory, they would have informed the conclusion and recommendations that relate to Uganda's obligations to international commitments (e.g., on climate change, biodiversity conservation, and sustainable development goals /agenda. Specific examples are the SDG 15 (Sustainable management of Forests; Combating Desertification; Halt/reverse Land degradation; Halt biodiversity loss), Target 13 (Combat Climate Change (mitigation) and SDG 13 (Life below water-fisheries); among others.

B: Unrealistic, unachievable mitigation actions: that would not effectively address the identified impacts (Table 5-1). For example, the following mitigations actions are either un attainable or irrelevant to the impacts sought to addressed:

Table 5.1: Assessment of mitigation measures

Summary of Project Development Phase Impacts and Proposed Mitigation Measures			Shortcoming	
ECOLOGY				
Impact	Proposed Mitigation Measure	Residual Impact	Residual Impact Rating	Shortcoming
Loss of vegetation on site during clearance	-Undertake proper project siting to avoid well vegetated areas -Restrict development to the woodland areas -Avoid encroaching on the wetland area -undertake landscaping after completion of road and labour camps works -Create buffers along the rivers and adjacent Bugoma CFR -Leave moist tropical vegetation thickets within the woodlands un disturbed	Vegetation loss is a must though mainly covered by woodland however, restoration and improvement by having green areas in addition to planting of trees will compensate for lost vegetation	Major	• Failure to attach measurable indicators to measure the mitigation action. Proposed measure does not show the scope/magnitude of the intended" action", thus rendering the mitigation actions "toothless" or likely to be ineffective • Mitigation action *to undertake landscaping after completion of road and labour camps works*, is not applicable to the impact being sought
Encroachment on the wetland leading to habitat loss	-Restrict developments to woodland areas only -Small section under wetland cover	No additional impact considering there is enough available land for the project	Minor	• Mitigation action - *Small section under wetland cover* - is ambiguous and not seem to address the impact
Increased exploitation of neighbourhood for firewood, poles etc.	-Conduct and implement a restoration management programme aimed at providing the required fuel wood for energy supply	Cooperation with the community in addition to land acquisition for this tree replanting, improvement on vegetation cover will be realised	Major	• Mitigation action - *areas for restoration is not identified*- thus action unlikely to be implemented
Habitat loss	-Area heavily degraded by the existing agricultural activities, charcoal burning, animal grazing and timber logging	Undertake replanting of areas previously under moist tropical forests	Major	• Mitigation Action - vague – does not commit the intended action
Biodiversity Loss	-Undertake proper project siting to avoid well vegetated areas -Restrict development to the woodland areas, -Avoid encroaching on the wetlands and moist tropical forest areas -undertake landscaping after completion of road and labour camps works -Create buffers along the rivers and adjacent Bugoma CFR -Leave moist tropical vegetation thickets within the woodlands un disturbed -Establish offsets	Vegetation loss is a must though mainly covered by woodland however, restoration and creation of off-sets will compensate for lost vegetation	Major	• Mitigation action - *Restrict development to the woodland areas*, - is misleading that there is no biodiversity in the woodland • Mitigation action- *Establish offsets* – is vague as it does not give indication what type of offsets and where is they will be established and by who.

C: Non assessment of Biodiversity impacts as required by part 115 of the National Environment Act 2019. This section provided for application of mitigation hierarchy in assessing the likely impacts on biodiversity, The ESIS does not show that this tools as applied. Thus the ESIS did not comply with the provision in law since the sugar cane growing project qualifies for this type of assessment.

5.2 The ESIA Certificate approval process and conditions (Certificate NEMA/ESIA/13079)

a. **Pre-conditions**: The following preconditions for issuing the Certificate of approval of the ESIA were ignored and thus render the certificate defective:

i. Part (i) of approval condition 4.1

...reads: The approved land take / project area acquired for the Mixed-Use Project, totalling 21.54 square miles (5579 hectares), **must be legally obtained,** in accordance with the Land Act Cap 227, and any other applicable law.

By time of issuing the Approval certificate, the ownership of the said land was not yet resolved. The Court case to this matter is pending ruling of the Court of Appeal.

ii. Prioritization of actions: priorities prescribed under condition 4.6 are not being followed.

iii. Relevant approval: approval condition 4.8 stipulates a subsidiary approval before commencement of project activities. This condition is not being followed, e.g., project activities are ongoing without the NFA approvals.

iv. Non-compliance with approval conditions: Approval condition 8.0 stipulates as follows:

8.0 SUSPENSION/WITHDRAWAL/CANCELLATION CONDITIONS

(i) This Certificate shall be suspended/withdrawn/cancelled if:

(a) there is no compliance with any of the **Specific Conditions** set out in this Certificate in **Section 4.0 above and any other substantive conditions of the Certificate**;

This condition has been violated by NEMA by failing to enforce it.

b. Inconsistencies between the Certificate and ESIS

Approval Condition 1.0: the approval is conditional the listed policies and legislation, among them the National Environment Act (2019) and The National Environment (Mountainous and Hilly Areas Management) Regulations. S.1 No. 153-6 which were never used to assess the likely environment and social impacts.

6 ANNEXES

6.1 Annex 1: Literature reviewed

a. Hoima Sugar Ltd (2020); Environmental and Social Impact Assessment Report, Kyangwali Mixed Land Use Project, To Be Located On Plot 216 Block 2 Buhaguzi, Kyangwali Sub-County, Buhaguzi County, Kikuube District
b. NFA (2013); Bugoma Forest Management Plan (2013-2023)
c. The National Environment Act (2019)
d. NFA (2017); Uganda's Forest Reference Emissions levels
e. GoU (2000); The National Forest Conservation Master Plan
f. GoU/UBOS 2019
g. NEMA (2020); Certificate of Approval of EIA (Certificate NO. NEMA/ESIA/13709)
h. NFA (2013); The National Forest Plan
i. GoU (2014): Tourisms Development and Strategy Plan (2014-2024)
j. EACOP (2019); ESIA for EACOP Project

6.2 Annex 2: Baseline information on Bugoma CFR

Feature	Description
Hydrology/Drainage	The only major river is Nkuse (Nguse) flowing along the southern boundary of Bugoma CFR towards Lake Albert. In general, the Bugoma CFR is rather poorly provided with permanent streams since most of the small ones dry up in the dry season. The only one which carries a permanent flow is Rutowa. However, Howa and Rwemiseke which used to be permanent are now seasonal.
Vegetation	**Forest:** The majority of the area (32,100 Ha= 80%) is covered by Tropical High Forest, classified as D2 (***Cynometra–Celtis*** forest) 4,000 Ha classified as K (***Albizia-Combretum – Terminalia – Hyparrhenia rufa***) and 3,500 Ha as N2 ***Combretum-Hyparrhenia*** Savannah) type; (Langade Brown et.al 1964). The main tree species are: *Albizia zygia; Hymenocardia acida; Albizia malacophylla; Lannea schimperi; Acacia hockii; Protea madiensis; Annona chrysophyllum; Pavetta crassipes;* ***Bridelia scheroneuroides; Rhus vulgaris; C****ombretum binderanum; Securidaca longipeduncula; Cussonia arborea; Stereospermum kunthianum; Combretum gueinzii ; Terminalia mollis; Entada abyssinica; Vitex doniana; Grewia mollis; andMaytenus senegalensis* Grasslands: The forest lies in irregular blocks intersected by large patches of grasslands. These grasslands are dominated by *Hyparrhenia spp* on the better and deeper soils with some areas of *Pennisetum purpureum* *Non-wood supplies:*
Biodiversity Values	According to the biodiversity report on Bugoma forest reserve (Report No. 9) Bugoma is an exceptionally rich forest particularly in terms of its vertebrate fauna with a number of Congo basin species being accorded eastern limits of their range. Two notable bird species that occur here are Nahan's Francolin (*Francelinus nahanis*) a globally data deficient and a black eared ground thrush (*Zoothera camaronensis*) known from only one other forest in the Ugandan part of its range. Sizable population of Chimpanzee (*Pan troglodytes*) lives in the forest and small numbers of elephants (*Loxodonta africana*) were recorded in the recent years. Bugoma represents one of the most extensive tracts of undisturbed forest at this altitude in East Africa, the report concludes. Bugoma is a core conservation forest according to the NCMP (2000). Of the 65 forests investigated for biodiversity, Bugoma ranks 12th in overall importance with a score of 14.1. It is among the large tropical high forest reserves of western Uganda. In terms of species diversity, it ranks 12th, but ranks 17th in terms of species rarity value. This is probably because it shares most of its species with the large forest found in no other forest in Uganda (including 7 species of butterflies and 2 species large moths). One species of Mammal is endemic to Uganda and one species (butterfly) is endemic to Albertine Rift. Howard (1991) recommended locating a SNR, in the centre of forest block. (Nkwaki North and South that would protect an area of forest containing mixed and *Cynometra arexandrii* dominated forest types. The

compartments adjacent to the SNR were to be zoned as buffer zone.

According to the FD Nature conservation master Plan (NCMP) of 1997, in addition to the above areas, the whole of Kasungwa and Kyangwali blocks (Kyangwali block now) were to be designated SNR. Today Kyangwali block is a SNR (6,241.87 Ha**)** and Southern part of NkwakiNorth (3,338.15 Ha) totalling to 9,580.02 equivalents to 23.3% of the total area. Buffer Zone is 6,831.57 Ha of NN and NS. However, Kyangwali block has no Buffer making its Management difficult.

Summary table of Biodiversity value for Bugoma (UFNCMP 2002)

Criterion	**Trees & Shrubs**	***Birds***	**Mammals**	**Butterflies**	**Month**	**Overall**
Total No. Known Spp	257	221	21	292	118	909
No.of restricted range Spp. (known from ≤ 5 forests)	7	22	1	65	13	108
Species unique to the forest (list)	None	None	None	*Leptosia*	*Orthogonioptilum*	
				marginea	*SpB*	9
				Falcuna	*Eustera Spp*	
				orientalis		
				Lachnocnema		
				magna		
				Bebearia		
				plistonax		
				Hypolimnas		
				deceptor		
				Osmodes omar		
				Fresna netopha		
Uganda endemic(list)	None	None	Crocidura selina, (shrew)	None	None	1
Albertine endemic	None	None	None	*Cymothoe ochreata*	None	1
(List)						
Species diversity						
(Score and rank)	6.6(24=)	6.5(24=)	5.8(36=)	9.8(3=)	10(1)	7.0(12)
Species rarity value						
(score and rank)	7(35=)	6.5(17=)	6.1(15=)	6.3(8)	7.4(8=)	6.8(17=)

Ecological Functions

In Bugoma CFR, there are quite a good number of streams that supply the main rivers like Nguse which later drain into Lake Albert. Bugoma CFR is a very well stocked forest as far as trees and other vegetation are concerned. It is therefore a very big carbon store in the area/region since forests and trees absorb carbondioxide gas emission (CO_2) from the atmosphere. Bugoma CFR, therefore plays a vital role as a carbon sink considering gases absorbed (tonnes/ha), thus reducing the ozone layer depletion and global warming. At the moment, Bugoma CFR serves as one of the major sink for GHGs that are likely to result from oil and gas activities in the Albertine graben.

National Economy

Direct values/benefits

- Tourism
- Wood products (timber, fuelwood & Charcoal) …including refugees

Indirect values/benefits

- Biodiversity …including corridors
- Ecosystem services (water, climate amelioration)
- Carbon sequestration …current and for oil industry + offset for Oil and Gas industry
- Water (for oil industry)

Tourism Potential

The presence of this old Karwata fort site is a potential tourist attraction. Present in this area, are a variety of bird and butterfly species; primates including baboons, chimpazees and monkeys. Establishment of a tourism site at Karwata was started by NFA in 2006/7 but stalled due to budgetary constraints.

The presence of Chimpanzees at Mwera (Nkwaki South block) makes it a potential tourist site. This site was licensed to African Nature Conservation Expedition (ANCE) for development as an ecotourism site in 2005. However, after the death of the developer, the project grounded

The close proximity to the Kabwoya and Bugungu Wildlife Reserve as well as Murchison Falls National park increases tourism potential of Bugoma CFR when these destinations are offered a tour package.

Investments by Destination Jungle (2014)

Investment estimates (USD); "000"				
Item	Description	Rate/Unit (US$)	Units	Estimates cost (US$)
Mobilization	Preparing investment documentation and Leases with NFA	3	1	3
	Preparing infrastructure development designs and layouts	4	1	4
	Environment Impact assessment Study and approval process	3	1	3
Construction	Contractor costs	20	1	20
	Construction	170	Lump sum	170
	Monitoring and supervision	2	Lump sum	2
Procurements	Labour/employees	11	6	66
	Equipment/facilities/furnishings/supplies	30	Lump sum	30
Marketing and Publicity	Marketing messages, tools and dissemination	3	Lump sum	3
TOTAL				**301**

Projection of revenues by Destination Jungle (2014)

The proposed investment projects to generate US$ 463,000 in form of Net revenues within 10 years. During the same period, the investment projects to incur operating costs amounting to US$ 388,000 during the same period. Table 3 below gives breakdown of the 10-year projections.

Income and expenditure projections

INCOME AND REVENUE PROJECTION (Currency: USD ("000")

Project Year			0	1	2	3	4	5	6	7	8	9	10
Investment Year			20	20	20	201	201	201	202	202	202	201	202

			14	15	16	7	8	9	0	1	2	3	4
Growth Rate (10%/annum)			0	2.00	5.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Projected Revenue (from Accommodation and Entrance)			0	40.0	44.0	48.4	53.2	58.6	64.4	70.9	77.9	85.7	94.3
10% Depreciation			0	0.0	4.4	4.8	5.3	5.9	6.4	7.1	7.8	8.6	9.4
VAT (18%)			0	7.2	7.9	8.7	9.6	10.5	11.6	12.8	14.0	15.4	17.0
Net Revenue			0	32.8	31.7	34.8	38.3	42.2	46.4	51.0	56.1	61.7	67.9
OPERATIONS	UNIT	Cost/Unit	Amt	Amt	Amt	Amt	Amt	Amt	Amt	Amt	Amt	Amt	Amt
YEAR 1													
Preparing investment documentation and Leases with NFA	3	1	3										
Preparing infrastructure development designs and layouts	4	1	4										
Environment Impact assessment Study and approval process	3	1	3										
Contractor costs	20	1	20										
Construction	170	Lump sum	170										
Monitoring and supervision	2	Lump sum	2										
Labour/employees	11	6	66										
Equipment/facilities/furnishings/supplies	30	Lump sum	30										
Marketing messages, tools and dissemination	3	Lump sum	3										
YEAR 2 - YEAR 10													
Facility Maintenance	12	0.25	0	3	3	3	3	3	4	4	4	4	4
Labour/employees	12	2	0	24	25	26	28	29	31	32	34	35	37
Marketing and publicity	1	3	0	3	0	0	0	0	0	0	0	0	0
Licenses and Fees	12	0.25	0	3	3	3	4	4	5	5	6	6	7
Total costs			**301**	**33**	**31**	**33**	**35**	**37**	**39**	**41**	**44**	**46**	**49**
Revenue				**33**	**32**	**35**	**38**	**42**	**46**	**51**	**56**	**62**	**68**
Net Profit				**-0.49**	**0.20**	**1.64**	**3.30**	**5.19**	**7.35**	**9.80**	**12.59**	**15.75**	**19.32**

Cultural uses

The Omukama and his abarusula seasonally visited Muhangaiza block to hunt mainly buffalos.

At Karwata, there is a cultural site (a fort) located on a hill which was built by Omukama Kabalega , which was used as his hide out and fighting ground . This area is known as Karwata meaning hideouts referring to the holes which were dug in the ground.

Other Cultural values (Worship/appeasement, burial grounds, etc.)

Social-economic values/Livelihoods

Bugoma forest supplies the following no-timber forest**(DIRECT VALUES/BENEFITS)**

- **Forest products**
  a. Rattan canes for making chairs, baskets, tables, granaries etc
  b. Raphia palms for making mats, baskets and banning tobacco.
  c. Fuelwood and construction poles (communities and Kyangwali Refugee Settlement Scheme)
  d. Mushrooms for eating
  e. White ants for eating
  f. Honey
  g. Wild coffee and yams
  h. Medicinal plants
  i. Latex
  j. Bamboo (in small quantities)

- **Forest produce**
  a. Stones
  b. Sand mining
- **Wildlife** animals (primates e.g, chimpanzee, birds, butterflies,etc for tourism

INDIRECT VALUES/BENEFITS

- Climate amelioration
- Existence values
- Safety net to effects of climate change (severe shortages of water, pasture, etc.)

MULTIPLIER BENEFITS

- Tourism…current and future….linked to Oil industry
- Water
- Pollinators

Economic value

Exploratory Inventory (EI) was conducted in the entire production zone during the period from November 2005 to March 2006, however, the report is not yet out. Data used was collected in Sept 2004 under ISSMI in MU3 & MU4 (formally NK5). The sample space was 100Ha and the sample size was 4.89% equivalent to 5ha.

Results of ISSMI inventory sample carried out 25-August to 3rd September 2004 September 2004 Number of two (N) per Ha by diameter class (cm).

Class (cm)	10-30	30-50	50-70	70-90	90+	Total
Timber High value	24.76	5.11	3.91	1.8	0.44	36.02

Timber Medium value	22.91	5.52	3.65	1.64	0.67	34.40
Timber low value	105.16	21.48	9.75	3.67	1.47	141.53
NTFP High value	2.05	0.61	0.04	0.01	-	2.71
NTFP medium value	18.82	0.20	0.03	0.01	0.02	19.09
NTFP Low value	43.78	3.48	0.14	0.02	-	47.42
Rare / Threatened species (total)	1.64	0.61	0.57	0.13	0.04	2.99
Key stone species (total)	19.64	2.66	0.38	0.15	0.11	22.94
Unclassified spp.	14.32	0.61	0.25	0.11	0.14	15.44
Cynometra alexandrii	3.27	1.64	0.35	0.33	0.32	5.91
Total for all species (M^3)	**256.35**	**41.94**	**19.07**	**7.89**	**3.21**	**328.44**

The forest is also rich in Rattan canes (*Calamus deeratus*) as per Fyffe's enumeration of 1937 with the estimated number of canes, 65,000 of which 40% were estimated to be mature.

Forest yields

The reliable source of data in Bugoma CFR is the report on Exploratory Inventory (EI) conducted from November 2005 to March 2006. For purposes of getting a picture of the yield in Bugoma, data of ISSMI report conducted in September 2004 has been used (Details are in Appendix 3.)

Bole volume (m^3) per hectare by diameter class (cm)

Class	**50-60**	**60-70**	**70-80**	**80-90**	**90+**	**Total**
Timber High value	2.98	5.08	4.20	2.85	3.65	18.76
Medium timber value	2.91	4.02	3.26	2.83	5.05	17.77
Low Timber value	8.07	10.90	8.01	5.89	13.29	46.16
High value NTFP	0.05	0.03	0.04			0.12
Medium value NTFP	0.03	0.03	0.03		0.14	0.23
Low value NTFP	0.11	0.13		0.07		0.31
Rare/ Threatened species	0.59	0.56	0.35	0.15	0.51	2.15
Key stone species	0.31	0.22	0.23	0.19	0.70	1.66
Un classified spp	0.12	0.54	0.17	0.32	1.57	2.71
Cynometra	0.20	0.37	0.41	0.56	1.97	3.51
Total for all species	**15.37**	**21.86**	**16.69**	**12.58**	**26.87**	**93.38**

other

Population

2014 Census Population by sex and sub county County	Sub county	Total Male	Total Females	Total Population
Buhaguzi	Bugambe	15,284	14,831	30,115
Buhimba		19,635	19,404	39,039
Kabwooya		32,239	30,879	63,118

Kiziranfumbi	17,832	17,758	35,590
Kyangwali	49,598	47,768	97,366
Kikuube District Total	134,588	130,640	265,228

Economic activities

Kikuube district is predominantly an agricultural district. The main economic activities for communities surrounding the site area are subsistence agriculture especially growing of maize cassava and beans. A number of trading Centres and towns have sprung up along Kabwoya-Kyangwali road, attracting people for business and employment opportunities. With several investors taking up available land for industrial development due to oil, the impact of the Industrialisation in the area is likely to accelerate urbanisation, improvement of social services and infrastructure.