MUFUNDI PAPER MILLS LIMITED

PROJECT

FOR

ESTABLISHMENT OF A GREENFIELD SUGAR STATE

WITH

INTEGRATED PROCESSING FACILITY

FOR

THE PRODUCTION OF SUGAR AND RELATED PRODUCTS

PREPARED BY:

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1.0 EXECUTIVE SUMMARY

1.1 Preamble:

Tanzania has been encouraging and promoting both sectors of Manufacturing and Agriculture so that it can achieve Agro- processing effect in the economy. Growing Sugarcane is an important commercial crop in Tanzania. It is the main source of table and industrial sugar produced for both export and domestic consumption. Currently, most sugarcane is grown in estates, owned by the sugar processing factories (SPF) as well as contract growers (CG). Hence the establishment of Agro-Proccessing Facility will be an impetus to the agricultural sector which is the mainstay of Tanzania's economy, providing a livelihood for about 85 percent of the economically active rural population.

With the country maintaining its political stability, foreign investors are guaranteed of continuity of economic policies adopted by the government and this is to be viewed as an added advantage for the growth of the economy. Sugar and its related products are currently used in as domestic consumption and also in beverages and food products.

The Promoters intends to utilize its strong product quality, production capabilities, service delivery, market knowledge to become one of major sugar producer in Tanzania.

1.2 THE PROJECT

Mufindi Paper Mills Limited (**MPM) among its various activities intends to** develop a large-scale sugar cane development and sugar manufacturing facility in Tanzania. The promoters having seen the immerse opportunities in the area of Agro -Processing subsector especially in sugar production, they have decided to venture on the establishment of a greenfield sugar estate with integrated processing facility for the production of sugar and related products. The aim is to produce sugar to meet the existing local demand and any excess to be exported in various country of the world products. The total investment of the whole sugar integrated facility will be the sum of **USD 201,859,900 to** be funded by the promoters' retained earnings .**USD 60 million**, foreign loan/supplier's credit **USD 110 million** and local loan **USD 32 million**. The manufacturing facility, with an installed capacity to produce **3,000 TCD (Tons of cane per day) in full capacity and will further increase to 7000 TCD in following**

two phases. It is with regard Mufindi Paper Mills Limited have decided to apply for the registration of integrated sugar project so that we can obtain certificate of incentive in order to enjoy necessary incentives as per TIA 1997.

1.3 PROMOTERS/ SPONSORS;

The project is sponsored by The Rai Group which is the largest sugar producer in East Africa with operations in Kenya and Uganda: In Kenya – through West Kenya Sugar Company Limited and Sukari Industries Limited, The Group is the largest sugar producer in the country (constituting approximately 30% of the country's entire sugar production) through three (3) existing operating factories and a fourth is in pipeline. in Uganda through Kinyara Sugar Limited, the country's second largest sugar manufacturing company. With the aim of the group to establish the same in Tanzania, the Rai Group's development objective is to set up a large agricultural industry in Kigoma region with a vast sugarcane plantation and integrated sugar complex. The investment will be undertaken through M/S Mufindi Paper Mills Limited Industries Limited. The main project sponsors are the shareholders of Mufindi Paper Mills Industries Limited.

The shareholders of Mufindi Paper Mills Limited who are also the shareholders of RAI own the largest integrated pulp and paper manufacturer in Tanzania having factory located at Mgololo, Iringa region. The intended integrated sugar Industry under their leadership and guidance will be a grand success. This business plan is intended to establish the technical feasibility, utility and economic viability of the project.

1.4 LOCATION

Mufindi Paper Mills Limited has identified land in Tanzania in the North of Kasulu District, adjoining River Malagarasi, this piece of land is considered as being ideal for the establishment of a greenfield sugarcane development and a sugar manufacturing factory. The integrated Agro-processing facility will be located in several Farms **210,211,212,213,214,215 in Kitanga & Kiyugwe, Nyarugusu, Kigadye, Herushingo, Nyamidaho and Kumtundu** respectively in kasulu district Kigoma region.

1.5 The company

M/S Mufindi Paper Mills Limited is limited liability company, incorporated in Tanzania under the COMPANY ORDINANCE (CAP212) under Certificate of Incorporation no: 47435 dated 12th November 2003. All the shareholders and directors of the company are given below and are well experienced businessmen with a strong financial back up and sound financial track record.

SHAREHOLDER	NATIONALITY	SHARES in %
Angle Hurst Industries Limited	British Virgin Island	85.45
Jaswant S. Rai	Kenyan	14.55

1.6 Capital Investment Plan and Sourcing of Funds

M/S Mufindi Paper Mills Limited proposes to invest **USD 201,859,900 for** this project. The breakdown of the relevant costs is as shown below:

Item	Amount	Total
Land/Building (***land development, irrigation and factory building***)	**111,748,000**	**111,748,000**
Plant	**63,000,000**	**63,000,000**
Vehicles	**12,223,000**	**12,223,000**
Furniture & Fittings	**888,900**	**888,900**
Pre-expenses	**2,000,000**	**2,000,000**
Others	**2,000,000**	**2,000,000**
Working Capital	**10,000,000**	**10,000,000**
TOTAL	**201,859,900**	**201,859,900**

Breakdown of Investments in 3 Phases

Particulars		Amt in USD
Phase-1	1-3 years	66,698,924.00
Phase-2	4-5 years	76,798,976.00
Phase-3	6-7 years	44,362,000.00
Other and Pre-Expenses		4,000,000.00
Working Capital		10,000,000.00
Total		**201,859,900.00**

1.7 Financing

The total investment cost of the project is planned to be financed by the shareholders retained earnings and shareholders contribution equity. The shareholders will seek for the loan if the need arises.

USD 000

	Amount	Total
Owners' Equity/ Internal accruals	**60,000**	**60,000**
Foreign loan/Supplier's credit	**110,000**	**110,000**
Local Loan	**32,000**	**32,000**
Grand Total	**202,000**	**202,000**

1.8 Financial Profitability:

Based on a set of assumptions given here in the project, it demonstrates a profitable trend in its future operations. The project's Income Statement and Cash flow indicate that M/S Mufindi Paper Mills Limited sugar project would be able to recoup the planned investment funds for its investment programme. This indicates that the project is financially and economically viable.

1.9 The Implementation Plan:

It is planned that the project will be implemented in phases and it will take up to seven years to be fully completed. The overall project is divided into 3 phases as follows: three development years (Year 1, 2 & 3) as Phase 1, Sugar Factory establishment in Phase 2 (Years 4 and 5) and Sugar Factory Expansion to 7,000 TCD and set-up and operationalization of the Ethanol Plan and related investments in Phase 3 (Years 6 to 7). Mufindi Paper Mills Limited shall appoint a team comprising of a competent building contractors, mechanical, process engineers, agronomist and chemical engineers in order to achieve the set implementation time.

1.10 Developmental Linkages:

Upon completion of the Implementation programme of the sugar manufacturing plant the project will be capable of creating the following:

- The project would aim at improving the livelihood of the communities of Kasulu and surrounding Districts of Kigoma region and would include modern farming technologies and best agricultural practices.
- Generating foreign exchange through exports
- Create employment for the local indigenous people;
- Promote inter-regional trade through exports to neighboring Democratic Republic of Congo; Uganda and Burundi just to mention a few.
- Enable the creation of forward linkages between production and distribution sector.
- Building of genuine and efficient import substitution industries so as to reduce the import bill, especially in the importing of industrial sugar.
- Create self – sufficiency in sugar
- Lay the foundation for the development of other industries.

2.0 THE SPONSORS

The project is promoted by M/S Mufindi Paper Mills Limited of Iringa with head office in Dar-es salaam. This is a limited liability company that was incorporated and registered in Tanzania under the Cap210 with a Certificate of incorporation **No 47435** dated **12th November 2003.** The company is owned by the following shareholders:

Shareholder	**No of shares**	**Shares%**
Anglehurst Industries Limited	333,110	85.45
Jaswant Singh Rai	56,698	14.55

The shareholders have proven performance and extensive in managing a range of commercially projects in Tanzania, Kenya and Uganda. M/S Mufindi Paper Mills Limited mission is to operate its dedicated assets and capabilities as a moving pipeline and to offer a safe, reliable and cost-efficient source of quality integrated sugar factory in Tanzania.

3.0 THE PROJECT

3.1 Project Description

M/S Mufindi Paper Mills Limited (**MPM) among its various activities intends to** develop a large-scale sugar cane development and sugar manufacturing facility in Tanzania.

The project's main purpose is to establish and integrated greenfield project based on large scale commercial sugarcane farming and simultaneously setting up an integrated sugar manufacturing facility to address the huge demand versus supply gap that exists in Tanzania.

The integrated sugar manufacturing plant will also result in the development of the following additional complimentary business / industries:

- Power Generation - The bagasse (by-product of sugar cane crushing) will be used for cogeneration of power.
- Ethanol - Molasses, a by-product from the sugar manufacturing process will be converted into ethanol tor industrial use.
- Bagasse-based pulping to manufacture wood-free paper – The surplus bagasse following power generation will be converted into bagasse pulp, which is a very valuable substitute for wood-based paper industry. This would enable production of wood-free paper (reducing the need for wood-based pulp) to manufacture products including writing and printing paper through environmentally friendly manufacturing processes.

3.2 The Phases of the project

The integrated sugar factory will be carried in Phases

Phase 1 – (Years 1-3)

This will constitute investments in land development, irrigation facilities and related infrastructure and development of land in cultivatable area into sugarcane farming. We propose to employ the sub-surface drip irrigation technology to effectively irrigate the land after development. This would be followed by planting good varieties of sugarcane into a commercial crop. The total investment expected for Phase 1 is estimated at **USD**

67 million, over a period of 3 years (Year 1 to Year 3). Subsequent to year 3, further investments in irrigation and infrastructure would continue, in line with the progress of sugar factory operations.

Phase 2 – (Years 4-5)

This will feature the development of a state-of-the-art sugar factory with an installed capacity of 3,000 tonnes of cane crushed per day (TCD), with an expandable capacity to 5,000 TCD to coincide with the cane development and availability.

The Sugar Factory is expected to be commissioned and operational from Year 4 and estimated to cost **USD 40 million** for the initial installed capacity of 3,000 TCD.

The development of the factory will also result in co-generation of power, by using bagasse (generated out of sugarcane crushing operation) as fuel in the boiler. The power generated, after internal consumption at the sugar factory, would have excess power that can be exported to the state grid on a commercial basis. Additional investment in cane development shall require an additional **USD 37 million** in years 4 and 5, bringing the total investment in Phase 2 to **USD 77 million.**

Phase 3 (Year 6 - 7)

Investments in Phase 3 comprise of further cane development, the expansion of the sugar processing plant to 7,000 TCD and the setting up of an Ethanol Plant with installed capacity of 60 Kilo litres per Day (KLPD) Capacity. The cane development cost in Phase 3 is estimated **at USD 12 million.**

i)Expansion of Sugar Capacity to 7,000 TCD

Further expansion to 7,000 TCD would involve addition of further plant and machinery. The total cost of the expansion from 3,000 TCD to 7,000 TCD is estimated to cost **USD 12 million.** The expansion would be undertaken in years 6 and 7, increasing the overall installed crushing capacity to 7,000 TCD capacity in year 7.

ii) Ethanol Plant

This also will be carried in phase three. The proposed investment involves setting up of a 60 kilo litres per Day (KLPD) Ethanol Plant, which can entirely consume the captively available molasses. The factory would adopt world class technology for molasses-processing, besides zero effluent discharge configuration. The total investment in the Ethanol Plant is estimated at **USD 20 million**, which would be incurred over a 2-year implementation period once the sugar factory commences its operation. The ethanol plant would be integrated into the sugar factory operations, as a forward integration to go up in the value chain. The entire ethanol produced, would be sold to the oil companies, who can blend the same with gasoline/diesel for automobile fuel requirements.

Furthermore, the ethanol can be substituted with gasoline/diesel to the extent of up to 10%, thereby reducing the overall cost of fuel while remaining an environmentally friendly alternative. Given the substantial demand for fuel in the country, the ethanol substitution would significantly save foreign currency to the exchequer and at the same time, while aligning with the country's climate change initiatives as an environmental-friendly initiative.

iii) Further investments in Bagasse Pulping

The excess bagasse that gets generated during the sugarcane crushing operations (after meeting the steam and power requirements of the sugar factory), can be further processed in a Bagasse Pulping Plant, to produce commercial bagasse pulp, an environmentally friendly replacement for wood pulp. The proposed project of converting excess bagasse to bagasse pulp would be undertaken after a successful implementation of the Ethanol project complete the value cycle of sugarcane farming.

4.0 Location

Mufindi paper mills limited has identified land in Tanzania in the North of Kasulu District, adjoining River Malagarasi. This piece of land is considered as being ideal for the establishment of a greenfield sugarcane development and a sugar manufacturing factory. The integrated Agro-processing facility will be located in several **Farms 210,211,212,213,214,215 in Kitanga & Kiyugwe, Nyarugusu, Kigadye, Herushingo, Nyamidaho and Kumtundu** respectively in kasulu district Kigoma region. The reason and rationale for choosing this area is that .

- As per Kigoma Investment Document Government published in 2019; There is no available sugar manufacturing facility in the north-western part of Tanzania at present hence this facility has come at the opportune time.
- The proposed project is supported by the current Government industrialisation drive aiming at becoming a middle-income country by year 2025.
- Kigoma Region is suitable for growing sugarcane based on availability of vast river valleys and vast plain land, and conducive climatic conditions for cultivation of sugarcane
- Kigoma Region grows sugarcane in all of its districts.
- The leading sugarcane producers are Kasulu District, with an average of 20,894 tonnes and Kibondo District, with an average of 7,040 tonnes per year.
- There is a growing demand for sugar in the region and in the neighbouring countries of DRC, Rwanda, Burundi, Uganda and South Sudan.
- The factory will reduce sugar shortages in the region and in the neighbouring regions where the demand is growing over time.

The region has set aside land for large-scale irrigation sugarcane farming. In Kibondo District, the sugar cane plantation at Malagarasi River Basin has been allocated 12,595 hectares of land, and in Kakonko District some 12,243 hectares has been allocated for sugar cane production at Lumpungu River Basin. In Kasulu District, the agricultural area at Kigadye has been allocated some 200,000 hectares for sugarcane plantations. The

Mufindi paper mill limited will work hand in hand with Kigoma region and the Government of Tanzania to make sure the site will be served with electricity, water and other communication facility The area is large enough to accommodate the factory and other buildings and also it can allow extensive future expansion of factory buildings.

4.1 Integrated facility Production Capacity

The machinery/ equipment to be opted for will be of modern status, with appropriate technological set up, fully provided with all the necessary accessories. The plant will have an envisaged installed processing capacity at an installed capacity to produce **7,000 TCD (Tons of cane per day) in full capacity**. The attainable the overall project is divided into 3 phases as follows: three development years (Year 1, 2 & 3) as Phase 1, Sugar Factory establishment in Phase 2 (Years 4 and 5) and Sugar Factory Expansion to 7,000 TCD and set-up and operationalization of the Ethanol Plan and related investments in Phase 3 (Years 6 to 7)

4.2 Source of Raw Materials:

The Raw material such as sugar cane will be sourced from the intended sugar plantations and from out growers. Other inputs will be. Other inputs will be imported within 4-5 days reach the port of Dar es Salaam. Some of the raw materials is also readily available from sources in Kenya, Europe, the Middle East and South Africa.

4.3 PRODUCTION PROCESS:

4.3.1 Sugarcane development and production planning

The development and production plans for the Kasulu Sugarcane Project is provided in the sections below. The overall project is divided into 3 phases as follows: three development years (Year 1, 2 & 3) as Phase 1, Sugar Factory establishment in Phase 2 (Years 4 and 5) and Sugar Factory Expansion to 7,000 TCD and set-up and operationalization of the Ethanol Plan and related investments in Phase 3 (Years 6 to 7)

4.3.2 Nucleus Area developed under Drip Irrigation

The development plan includes the establishment of Nurseries A and B and commercial cane planting thereafter. Due to the sub surface drip irrigation technology being employed for the sugarcane cultivation, the cane plants are estimated to have up to 6 ratoon cycles.

- The Production-Plan table computes the annual hectarage increase from cane establishment and eventually to sugar production.
- As per the year-wise Land Development, Irrigation, Cane Nursery Development, Plantation, crop management, harvesting and transportation plan, it is projected that at the end of 3 years, there would be standing crop of about 225,000 tonnes of cane, which can be harvested and transported to the Sugar Factory.
- The sugarcane yields under drip irrigation is about 100 Tons / Ha for the first harvest and 90 Tons/Ha for the subsequent ratoon crops.
- The sugarcane supply to the Sugar factory out of the drip irrigated area (nucleus) in the Year 7 is estimated at 851,758 Tons.

4.3.3 Rainfed Area Plantation

- Cane development under rainfed conditions would be done using the additional seedlings supplied by the nurseries and cane development would be done in rainfed conditions, after the land preparation.
- The sugarcane yields under rainfed conditions are at around 60 Tons/Ha for plant crop and 50 Tons/ha for ratoon crop.
- On the above basis, there would be a standing crop of 24,000 Tons at the end of 3rd year for the nucleus area under rainfed condition.
- The sugarcane supply to the Sugar Factory out of the rainfed area (nucleus) in the Year 7 is estimated at 375,000 Tons

4.3.4 Out grower Area

- It is proposed to have an elaborate out grower development program for developing sugarcane under out grower model.
- The company would supply the sugarcane seedlings developed under the nursery and cane development would be done for the out growers, including land preparation and other assistances from the Sugar Factory.
- The Sugarcane Yields for Out growers is assumed around 60 Tons/Ha for Plant crop and 50 Tons/ha for ratoon crop.
- On the above basis, there would be a standing crop of 30,000 Tons at the end of 3rd year for the nucleus area under Out growers.
- The sugarcane supply to the Sugar factory out of the out-grower area in the Year 7 is estimated at 309,983 Tons

4.3.4 Total Cane Supply to Sugar Factory

- After one year from Day Zero, all the activities regarding the Sugar project would also commence so that when the sugarcane crop is ready for harvesting, the 3,000 TCD Sugar factory would be in operation (Phase 2), which would eventually be expanded to 7000 TCD Sugar factory by the 7th year (Phase 3)
- Based on the Cane development and harvesting plan, the cane availability for the Sugar factory would gradually improve to 1,536,740 Tonnes by the year 7 by which time, the Sugar factory would have the crushing capacity of 7000 TCD to synchronise with Cane Supply.
- As the by-products, molasses and bagasse generation increases in line with cane crushing. There would be separate investments for processing of molasses into ethanol, which would be set up in Year 7 (Phase 3). The bagasse generated would initially be used for cogeneration of power in the Sugar Factory and eventually, the excess bagasse would be depicted. The bagasse pulping facilities would be set up at a later date.

KIGOMA - KASULU DISTRICT - SUGARCANE DEVELOPMENT AND SUGAR PRODUCTION PLAN								
PROJECT YEARS	**YEAR**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
PHASING		**PHASE 1**	**PHASE 1**	**PHASE 1**	**PHASE 2**	**PHASE 2**	**PHASE 3**	**PHASE 3**
CANE DEVELOPMENT PLAN - AREA UNDER NUCLEUS								
TOTAL ALLOTTED AREA	Ha	37,662	37,662	37,662	37,662	37,662	37,662	37,662
LESS : Forest Reserve, Swamp areas, road reserves	Ha	5,300	5,300	5,300	5,300	5,300	5,300	5,300
Area for Cultivation	Ha	32,362	32,362	32,362	32,362	32,362	32,362	32,362
Land Development	Ha	1,500	4,000	4,500	5,000	5,000	5,000	7,362
NUCLEUS DEVELOPED AREA - CUMULATIVE	**Ha**	**1,500**	**5,500**	**10,000**	**15,000**	**20,000**	**25,000**	**32,362**
AREA UNDER DRIP IRRIGATION PER YEAR	**Ha PA**	**1,500**	**3,500**	**3,500**	**3,000**	**3,088**		
CUMULATIVE AREA UNDER DRIP IRRIGATION	**Ha**	**1,500**	**5,000**	**8,500**	**11,500**	**14,588**	**14,588**	**14,588**
RAINFED CROP	Ha			**400**	**1,060**	**1,830**	**4,080**	**6,700**
AREA FOR CROP ROTATION	Ha		1,500	2,550	3,450	4,376	4,376	4,376
AREA FOR FACTORY, HOUSING, ROADS, OTHER INFRA	Ha		2,500	2,500	2,500	2,500	2,500	2,500
GREEN BELT DEVELOPMENT	Ha				500	1,000	2,000	2,000
AREA FOR EXPANSION					2,198	2,198	2,198	2,198
TOTAL	**Ha**				**21,208**	**26,492**	**29,742**	**32,362**
PRODUCTION PLAN								
NUCLEUS - UNDER IRRIGATION								
Plant Cane area	Ha p.a.			2,250	2,250	2,250	2,250	2,250
Cumulative Plant Cane Area developed	**Ha**			**2,250**	**4,500**	**6,750**	**9,000**	**11,250**
Yield	Tons /Ha			100	100	100	100	100
Plant Cane- First Harvest	Tons			225,000	225,000	225,000	225,000	225,000
Ratoon I area	Ha			-	2,025	2,025	2,025	2,025
Yield	Tons /Ha				90	90	90	90
Cane - Ratoon I	Tons			-	182,250	182,250	182,250	182,250
Ratoon II area	Ha			-	-	1,823	1,823	1,823
Yield	Tons /Ha					90	90	90
Cane - Ratoon II	Tons			-	-	164,025	164,025	164,025
Ratoon III to Ratoon VI area	Ha			-	-	-	1,640	3,116
Yield	Tons /Ha						90	90
Cane - Ratoon III-VI	Tons			-	-	-	147,623	280,483
TOTAL CANE SUPPLY - IRRIGATED LAND (NUCLUES)				**225,000**	**407,250**	**571,275**	**718,898**	**851,758**
RAINFED CROP								
Plant Crop - First Harvest	Ha p.a.			400	700	1,200	3,000	4,000
Yield	Tons /Ha			60	60	60	60	60
Cane available out of Rainfed Crop (First crop)	Tons			24,000	42,000	72,000	180,000	240,000
Ratoon Crop Area	Ha				360	630	1,080	2,700
Yield	Tons/Ha				50	50	50	50
Cane available out of Ratoon Crop (Rainfed)	Tons				18,000	31,500	54,000	135,000
CANE SUPPLY - RAINFED (NUCLEUS)	**Tons**			**24,000**	**60,000**	**103,500**	**234,000**	**375,000**
CANE SUPPLY - IRRIGATED + RAINFED (NUCLEUS)	**Tons**	-	-	**249,000**	**467,250**	**674,775**	**952,898**	**1,226,758**
CANE DEVELOPMENT PLAN - AREA UNDER OUTGROWER CANE								
Plant Cane - Area under cane development	Ha p.a			500	900	1,200	1,500	1,500
Cumulative Plant Cane Area developed	**Ha**			**500**	**1,400**	**2,600**	**4,100**	**5,600**
Yield	Tons /Ha			60	60	60	60	60
Plant Cane- First Harvest	Tons			30,000	54,000	72,000	90,000	90,000
Ratoon I area	Ha p.a			-	450	810	1,080	1,350
Yield	Tons /Ha				50	50	50	50
Cane - Ratoon I	Tons			-	22,500	40,500	54,000	67,500
Ratoon II area	Ha p.a			-	-	405	729	972
Yield	Tons /Ha					50	50	50
Cane - Ratoon II	Tons			-	-	20,250	36,450	48,600
Ratoon III to Ratoon VI area	Ha p.a						1,094	2,078
Yield	Tons /Ha						50	50
Cane - Ratoon III-VI	Tons						54,675	103,883
CANE AVAILABILITY OUTGROWERS	**Tons**			**30,000**	**76,500**	**132,750**	**235,125**	**309,983**
AREA UNDER CANE DEVELOPMENT - OUTGROWERS	**Ha**	-	-	**500**	**1,350**	**2,415**	**4,403**	**5,900**
TOTAL CANE AVAILABILITY - NUCLEUS + OUTGROWERS	**Tons**			**279,000**	**543,750**	**807,525**	**1,188,023**	**1,536,740**
SUGAR FACTORY OPERATIONS	**YEAR**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Cane Crushing	Tons/yr				822,750	807,525	1,188,023	1,536,740
Sugar Recovery	%				10%	10%	10%	10%
Sugar Production	**Tons/yr**				**82,275**	**80,753**	**118,802**	**153,674**
Installed Plant Capacity	**TCD**				**3,000**	**3,000**	**5,000**	**7,000**

On the above basis, it is estimated that cane availability in a normalised year of operations (Year 7) after full sugarcane development, would be about 1,536,740 tonnes/year.

Sugarcane Farming (Phase 1)

4.4 Project Development

The Mufindi Paper Mills Ltd proposes to undertake a large-scale sugarcane plantation as part of Phase 1. This development and cultivation of cane would be located within the overall arable land area of the proposed 37,662 ha.

The aforesaid area of 37,662 Ha is comprised in Survey Numbers 210,211,212,213,214 & 215 contains certain portion which are in a hilly terrain / stony terrain. Hence, the preliminary planning for the sugarcane farming is based on the feasibility to maximise irrigation and supplemented by rainfed irrigation. The details of proposed irrigation and development is given in the following table:

Survey Numbers	Name of the Village	Area requested by Rai Group (Ha)
210	Kitanga Kiyunge	8,199
211	Nyarugusu	16,124
212	Kigadye	3,507
213	Heru-Shingo	2,885
214	Nyamidaho	3,196
215	Kumtundu	3,751
Total		**37,662***

The total land area available is subject to verification of extent in each of the survey numbers

Some parts of Nyarugusu Area (Survey No.211) where there are significant rocky terrain portions and elevation of 50 metres or more, it would be difficult to do drip irrigation in a viable manner due to higher costs of water pumping. in such areas, we propose to do

rainfed plantation and green belt development, besides areas needed for factory construction, colonies and other facilities.

The following is the plan for utilising the area of 37,662 Ha.

	Hectares
Total Area allotment requested	**37,662**
Less : Forest reserve, Swamp, road reserve etc.	5,300
Area for Cultivation	**32,362**
Area under Drip Irrigation	14,588
Area under Rainfed Crop	6,700
Area for Crop rotation	4,376
Area for Factory, Colony, Roads, other infrastructure	2,500
Green belt development	2,000
Area for expansion	2,198
Total	**32,362**

The following are the activities and operations that must be undertaken during the planning and pre-implementation phases of the project:

a. Block layout design including irrigation, drainage and infrastructure positioning.
b. Land development programme.
c. Crop development schedule.
d. Irrigation requirements and specifications.
e. Agriculture system recommendations.
f. Phased machinery requirements (contractor and in-house);
g. Manpower requirements.
h. Offices, workshop and stores requirements; and
i. Capital and operating budget estimates

4.5 Sugarcane Production Summary (Phase 2)

- The Sugar Factory would come into operation in Year 4 with finalisation of orders for supply of Plant and machinery and other project activities shall begin in Phase 1.
- Cane deliveries to the factory are estimated to be at 822,750 Tons in Year 4 when the Sugar factory starts full year operations.

- This is based on an assumption of 12-month crop and would be tuned based on the actual crop days, which would be clear at the next stage once detailed analysis gets completed.
- Delivered cane is estimated to average 10% sucrose and 15% fibre during harvest.
- Cane is to be harvested un-burnt with a chopper-harvester into rolling-bin trailers.
- The Sugar Factory capacity shall be from factor net crushing capacity at the ramped-up capacities during normal year would be 5,000 tonnes cane /day (over 22 hours of operations), the capacity of which can be further ramped up when required.

4.6 Sugar Factory Expansion and Establishment of Ethanol Project– Phase 3

Sugar Factory Expansion up to 7,000 TCD

- Increased Sugarcane availability from the nucleus farm as well the out-grower cane development shall result in an increased supply of cane to the Sugar Factory year-on-year.
- With a view to process the supplied sugarcane, the sugar factory crushing capacity shall need to be suitably expanded.
- The Sugar Factory installed in Phase 2 has an installed capacity to crush 3,000 TCD, expandable to 5000 TCD with marginal investment required.
- Further expansion would be undertaken to increase the capacity to 7,000 TCD in Year 7.
- The total investment required for the subsequent mill capacity expansion is USD 12 million.

4.7 Ethanol Production

- Sugarcane processing produces by-product molasses at about 4% of the sugarcane crushed. This by-product molasses is rich in fermentable sugar content, which cannot be converted into sugar crystals.

- This fermentable sugar content of molasses, is processed in a distillery, using yeast as agent, to convert into alcohol.
- After a series of processing, including re-distillation, molecular sieve adsorption etc., the final output of the distillery would be "Ethyl Alcohol", also known as ethanol, which is an environmentally friendly fuel.
- The ethanol project would adopt world class technology for molasses processing, besides zero effluent discharge configuration. The total investment in the ethanol plant is estimated **at USD 20 million**, which would be incurred over a 2-year implementation period once the Sugar Factory commences its operation.

Ethanol Production		
YEAR		**7**
Sugar Factory Capacity	TCD	**7,000**
Cane Crushed	Tons/Yr	1,536,740
Molasses Production @3.75% per Ton	Tons/Yr	57,628
Ethanol production @240 Litres/Ton of Molasses	**KL/Yr**	**13,831**
Ethanol Production per Day	KLPD	46
Capacity utilisation of Ethanol Plant	%	77%

- As can be seen from the above table, the molasses from the Sugar Factory as by product would be 57,628 tons in Year 7 as per the production plan.

- This quantity of molasses would be processed in the Ethanol plant of 60 KLPD Capacity.

- The Capacity utilisation of the Ethanol Plant in its first year of operations (Year 7-Phase 3) would be about 77%.

Future Project: Bagasse Pulping

- Sugarcane contains fibre content of between 15%-16% for a 12-month crop and the moisture content in sugarcane is about 50%. On this basis, the average bagasse generation out of 1 ton of sugarcane would be 30% of bagasse.

- This bagasse by-product is a fibrous material containing short and long fibres and also pith, a powdery material.
- The bagasse is primarily used as fuel in the boiler for generating steam for processing of sugarcane juice.
- The saved, depicted bagasse (which is about 12% of the total bagasse generation in the Sugar factory), can be used as a raw material in the paper mill for converting the bagasse into bagasse pulp.
- The bagasse pulp, suitably mixed with wood pulp, can result in various products including writing and printing paper and other grades.
- The key benefit of bagasse pulp is:
    - This is wood-free
    - Renewable source of fibre (as sugarcane is a renewable crop, with as much as 6 ratoons)
    - Use of bagasse pulp as a raw material would result in many products which are presently being imported into Tanzania
    - The above would result in saving precious foreign exchange, benefiting the country
    - This project would be taken up after successful implementation of Phase 3.

4.8 PROPOSED SUGARCANE DEVELOPMENT, SUGAR MILL INSTALLATION AND EXPANSION AND Ethanol Project (Phases 1-3)

The following table gives a yearly development plan, component wise to give a broad idea of the timelines involved.

OVERALL PROJECT TIMELINES		YEARS						
YEAR	ZERO DT	1	2	3	4	5	6	7
PHASE 1 - SUGARCANE DEVELOPMENT								
Zero Date; Handing over of land, confirm water rights, verify Government approvals								
Land Development, Orders for Capital Assets, Primary Nursery, Irrigation Design, Order placement								
Irrigation Structure completion, Secondary Nursery								
Commercial Cane Plantation, Arrangement for Transport etc								
Harvesting, Transport and Supply to Sugar Plant								
Detailed Investment proposal for Phase 1								
Financial closure (in the interim, Sponsor's capital would be used)								
PHASE 2 - SUGAR FACTORY								
Delivery, Erection of Sugar Factory of 3,000 TCD capacity, expandable to 5,000 TCD								
Commencement of Commercial Production of Sugar								
Sugar Factory Capacity Expansion - Delivery, Erection and commisioning of expansion to 5,000 TCD								
Sugar Factory Capacity Expansion - Delivery, Erection and commisioning of expansion to 7,000 TCD								
PHASE 3 - ETHANOL PLANT								
Project Reporting/ Environment Assessment/ Funding arrangement								
Delivery, Erection/Commissioning of Ethanol Plant 60 KLPD								

4.9 Setting Up of a Grass-root Sugar Factory – Phase 2

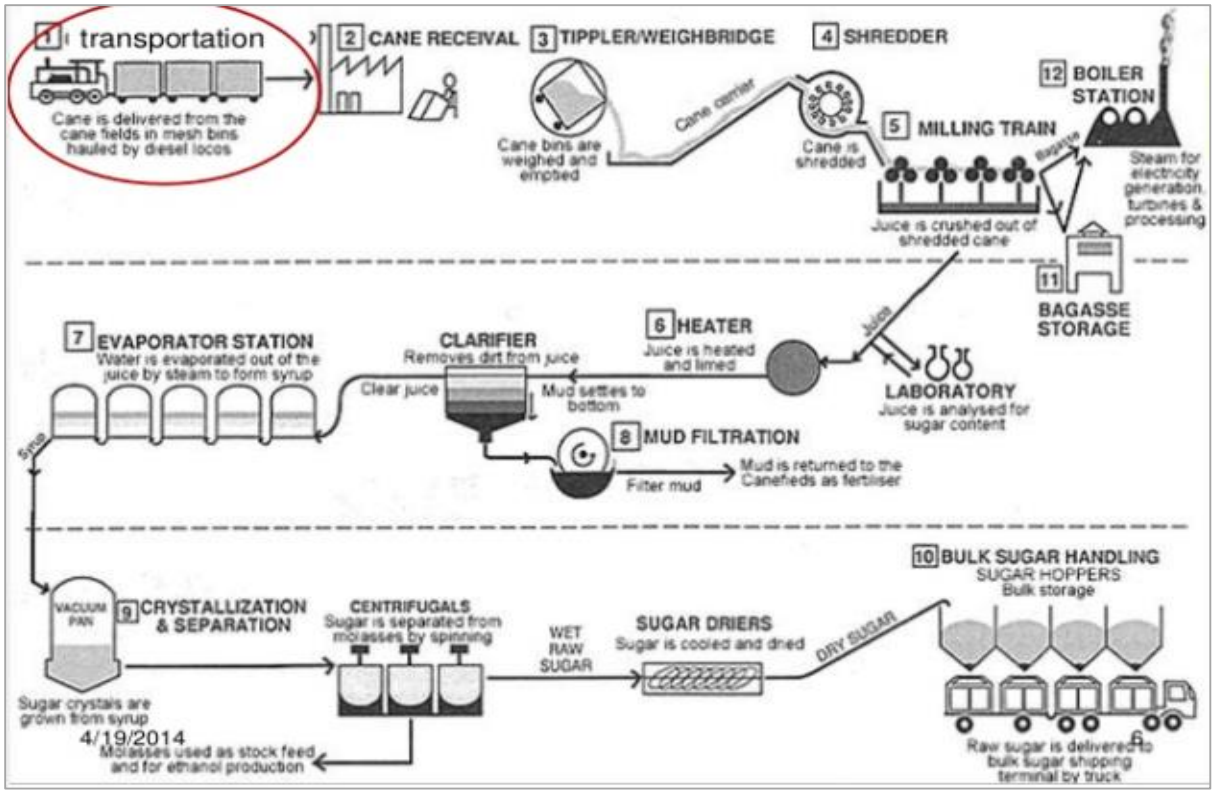
With implementation various cane development programs mentioned in Phase 1, the estimated sugarcane availability during the year 4 from date zero is estimated to be about 822,750 Tonnes per year. This is further expected to increase from year to year.

With a view to effectively crush the sugarcane developed under Phase 1, it is proposed to set up a state of the art, 3,000 TCD Sugar Factory, expandable to 5,000 TCD with further balancing equipment. This factory would have its operations starting from Year 4.

The Sugar factory would have the following main sections:

- Cane Milling Plant
- Juice Boiling House
- Sugar Syrup Processing area
- Sugar Drying and handling area
- Boiler and Turbine House
- Auxiliary sections

The following is the schematic representation of a Sugar Factory operation:



The Proposed Sugar Factory would process the following quantities of sugarcane each year from Year 4:

SUGAR FACTORY OPERATIONS	YEAR	4	5	6	7
Cane Crushing	Tons/yr	822,750	807,525	1,188,023	1,536,740
Sugar Recovery	%	10%	10%	10%	10%
Sugar Production	**Tons/yr**	**82,275**	**80,753**	**118,802**	**153,674**
Installed Plant Capacity	**TCD**	**3,000**	**3,000**	**5,000**	**7,000**
Molasses Production	Tons.yr	30,853	30,282	44,551	57,628
Bagasse Net Savings	Tons.yr	97,946	96,134	141,431	182,945

The total estimated cost of setting up the 3,000 TCD expandable to 5000 TCD Sugar factory is as follows:

Activity	Investment (USD)
Site Development	2,000,000
Civil Works	7,000,000
Plant and machinery supply	28,000,000
Erection and Commissioning	3,000,000
TOTAL	**40,000,000**

The above is an indicative estimate for a 3,000 TCD Sugar Factory expandable to 5,000 TCD sugar factory. The cost of expanding the mill capacity to 5,000 TCD is expected to be marginal and would thus be funded through internally generated cash flows in year 6 in Phase 3. This Sugar Factory would be expanded to 7,000 TCD in Phase 3 (Year 7) at a cost of USD 12 million, which would handle the total sugarcane supply of 1,536,740 Tons in Year 7.

5.0 MARKETING ASPECTS

5.1 Sugar Production in Tanzania

Growing Sugarcane is an important commercial crop in Tanzania. It is the main source of table and industrial sugar produced for both export and domestic consumption. Currently, most sugarcane is grown in estates, owned by the sugar processing factories (SPF) as well as contract growers. Due to seasonal rainfall shortages, sugarcane farms in Tanzania are situated along river valleys to facilitate supplementary irrigation during the season. To date, only three regions are considered suitable under the above criteria for sugarcane production, i.e., Morogoro (Kilombero & Mtibwa Valleys), Kilimanjaro (under Irrigation Scheme) and Kagera (River Kagera Basin). There are two major sugarcane estates in Morogoro, Kilombero Sugar Company and Mtibwa Sugar Estates. These together produce over 80,000 tons of processed sugar. Over 35,000 tons of processed sugar are produced annually.

The Kagera Sugarcane Estates are fairly small, producing only about 2,000 tons of processed sugar annually. The total current sugarcane production in Tanzania is below the country's annual demand for the commodity. The sugar industry in Tanzania provides direct employment to about 30,000 people. Sugar production is concentrated mainly in 3 regions: Morogoro, Kagera, and Kilimanjaro. At present, there are 4 sugar estates in Tanzania: The Kilombero Sugar Company with 40% market share, the Tanganyika Planting Company (34%), Kagera Sugar (17%), and Mtibwa Sugar Estates (9%).

5.2 Sugar production in Africa

In Africa, South Africa and Egypt are the major sugar producing countries with more than 15 million MT and about 12 million MT respectively. Mauritius, Sudan, Zimbabwe and Kenya also produce sugar but less than half of the foregoing countries (Table 2). In Tanzania, sugarcane production per year is 1.5 million MT, that is almost the same as in Zambia, Côte d'Ivoire, Gabon, Cameroon and Zaire in Tropical Western Africa. According to the statistics, the average yield of sugarcane in Tanzania is extremely high as in Egypt and Zimbabwe, 1.5 times larger than the world average yield. However, research carried

out in the country during the past ten years shows that the country has the potential to become a net exporter of the commodity if the current constraints limiting production at the farm level were removed. (Source internet)

5.3 Mufindi Paper Mill Sugar Project

M/S Mufindi Paper Mills Limited by considering to start sugar production facility in Kigoma **considers** itself to be in a unique position in that it could service a sizeable proportion of Tanzania's main economic sectors and that of neighbouring countries. The company relies on growth in both agro-processing and large industrial sectors for its markets. The Tanzania's economic political and social environment is thus of crucial importance to the company.

5.4 Sugar Industry in Tanzania

As of 2019, Tanzania was producing on average 359,000 tonnes of sugar per annum with an annual demand of 670,000 tonnes (increased from 610,000 Tonnes in 2018), 515,000 tonnes were for direct domestic consumption and the remaining 155,000 tonnes for industrial use. This demand supply gap has further widened with the current estimates of 710,000 Tonnes of demand whereas there has been no significant increase in the production declared so far.

5.5 Sugar Supply in Tanzania

The following table indicates the Production and Import-Export position year on year:

YEAR	PRODUCTION (Tonnes)	IMPORT (Tonnes)	EXPORT (Tonnes)	DIRECT CONSUMPTION (Tonnes)
2009/10	263,461	129,076	9,100	383,437
2010/11	304,135	104,979	30,500	378,614
2011/12	262,879	279,492	22,100	520,271
2012/13	299,698	163,440	60,450	402,688
2013/14	294,300	143,282	2,800	434,782
2014/15	304,007	207,673	-	511,680
2015/16	293,075	240,205	-	533,280
2016/17	330,843	254,952	-	585,795
2017/18	307,431	259,514	-	566,946
2018/19	359,219	169,919	-	529,138

5.6 DEMAND FOR SUGAR IN TANZANIA

DEMAND (In tonnes)	2020/21	2019/20	2018/19	2017/18	2016/17
Demand for Industrial Use	175,000	165,000	155,000	145,000	135,000
Demand for Direct Consumption	580,000	545,000	515,000	485,000	455,000
Total Demand	**755,000**	**710,000**	**670,000**	**630,000**	**590,000**
Domestic Production	350,000*	350,000*	359,219	307,431	330,843
Demand Gap	**405,000**	360,000	310,781	322,569	259,157

4 *Assuming the production figures at 350,000 in 2020 & 2021; as of now, no additional capacities till (2021)

5.4 As can be seen from the above table, the demand-supply gap is expected to increase to over 400,000 tons in 2021 and the gap would increase considerably in future

5.5 Distribution

Production will be sold at the factory, where both wholesale and retail customers would be served. The company will also have distribution trucks, which would carry the product to various depots, especially in Dar es Salaam where the market is concentrated. This would be a strategy to increase sales.

5.6 Marketing Strategies:

M/S Mufindi Paper Mills Limited Management team shall take proactive marketing and promotional strategy to ensure that the company achieves high turnover of sales through sales made to corporate customers. In order to achieve optimal business turnover management shall design and implement the following strategies;

5.7 Advertisement

These would include the local media namely local television, social medias, Radio commercials and Newspaper advertisements etc.

6.0 MANAGEMENT

6.1 Staff Recruitment Strategy

The strategy shall be to fill in key managerial positions with people who have extensive experience and sound qualifications in managing companies those who have experience in sugar industry. The staff would include a General Manager who will be assisted by departmental managers namely as shown in the organisation structure.

6.2 Organisation Structure

The organisation structure of the project is proposal to be as follows:

Annexure -1 attached.

6.3 Manpower Requirement

The company intends to employ 40 expatriates and **860 (permanent local staff)**.Total employment will be **900** people including forty expatriates' persons.

7.0 CAPITAL INVESTMENT COSTS

M/S Mufindi Paper Mills. proposes to invest **USD 201,859,900** for developing this project. It is planned that some investment cost will be financed by personal shareholders' contribution and other funds will be sought from Banks. Furthermore, the sister company's Self-Generated Funds shall be utilized at a later stage for working capital funds. Following is the projects investment plan and sources of financing:

The breakdown of the relevant costs is as shown below:

Item	**Amount in USD**	**Total in USD**
Land/Building (***land development, irrigation and factory building***)	**111,748,000**	**111,748,000**
Plant	**63,000,000**	**63,000,000**
Vehicles	**12,223,000**	**12,223,000**
Furniture & Fittings	**888,900**	**888,900**
Pre-expenses	**2,000,000**	**2,000,000**
Others	**2,000,000**	**2,000,000**
Working Capital	**10,000,000**	**10,000,000**
TOTAL	**201,859,900**	**201,859,900**

7.1 Financing

The total investment cost of the project is planned to be financed by the shareholders retained earnings and shareholders contribution equity. The shareholders will seek for the loan if the need arises.

USD 000

	Amount	**Total**
Owners' Equity /Internal accrual	**60,000**	**60,000**
Foreign loan/Suppliers credit	**110,000**	**110,000**
Local Loans	**32000**	**32,000**
Grand Total	**202,000**	**202,000**

7.2 Machinery and equipment's costs are based on quotation from supplier. It should be noted that duty and VAT tax have not been included, meanwhile the allowance on corporate tax will be determined in the course of the project approval.

8.0 PROJECT FINANCIALS

8.1 PROJECT FINANCIAL VIABILITY

The financial analysis indicates that the proposed project would be a profitable venture.

8.2 Projected Profit and Loss Accounts

The project is expected to make a post-tax profit during its first year of commercial operation.

8.3 Projected Cash flows

The projected cash flows show that the project would be able to honour its financial obligations as they fall due throughout the project's economic life and still remain with reserve of cumulative cash that could be re-invested in the project.

9.0 CONCLUSION

The investment and development of this sugar integrated industries undertaking is in line with the Government objective of encouraging proper development industries in the country. In addition, it will have a positive impact on the development of the region, as it would generate a number of benefits and more positive impact on the economy of the area. As noted above, this undertaking will bring about a generation of a number of benefits and reliable incomes for the employees of the project and providers of the services and goods demanded by the project's workforce /their families.

In the context of the immense useful potential of this project, the Management of M/S Mufindi Paper Mills Limited anticipates that all interested parties in the region/ and the Government of Tanzania will give their full support so as to ensure timely implementation of the project and apprehension of successful operation.