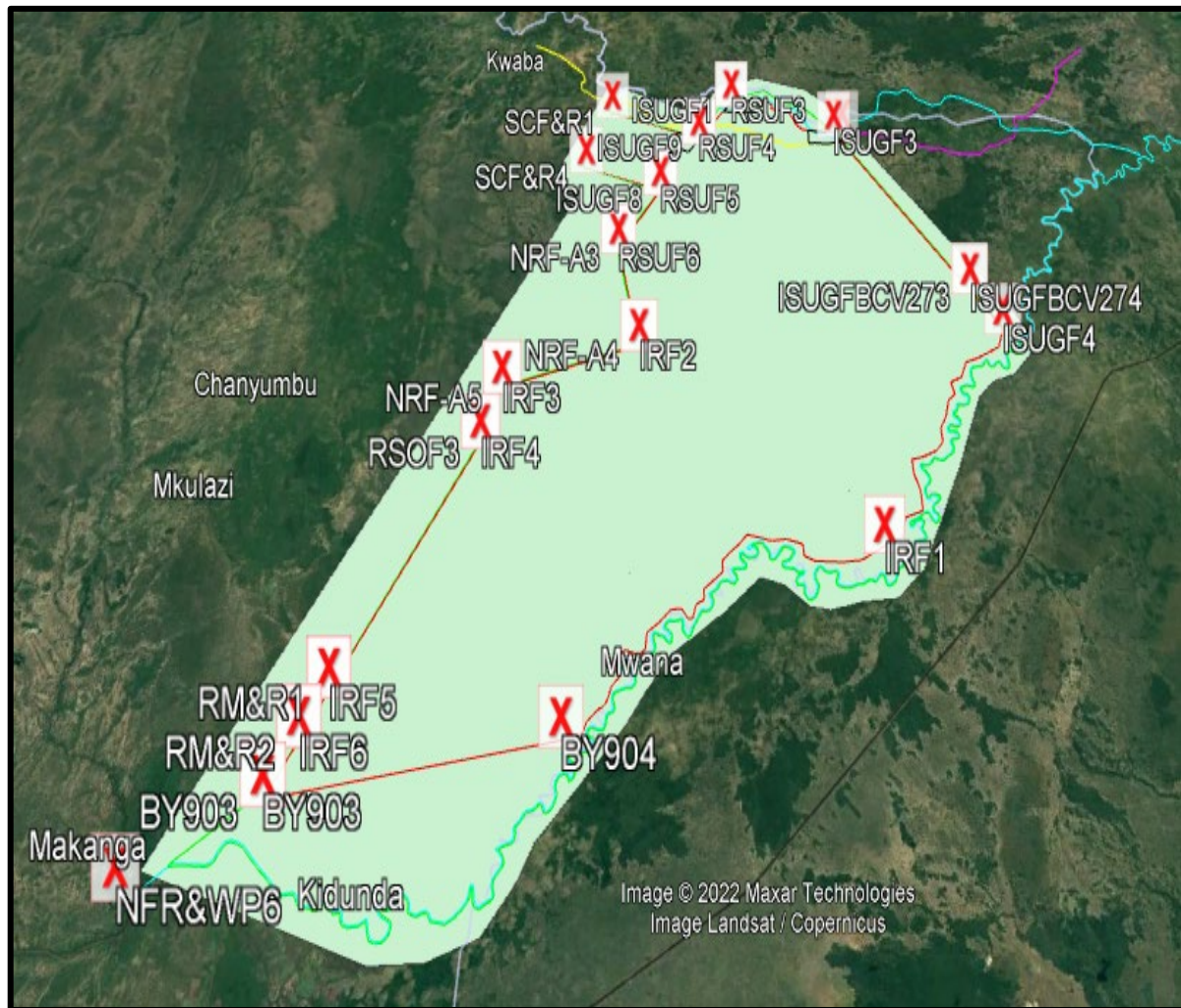


# PROJECT OBJECTIVE

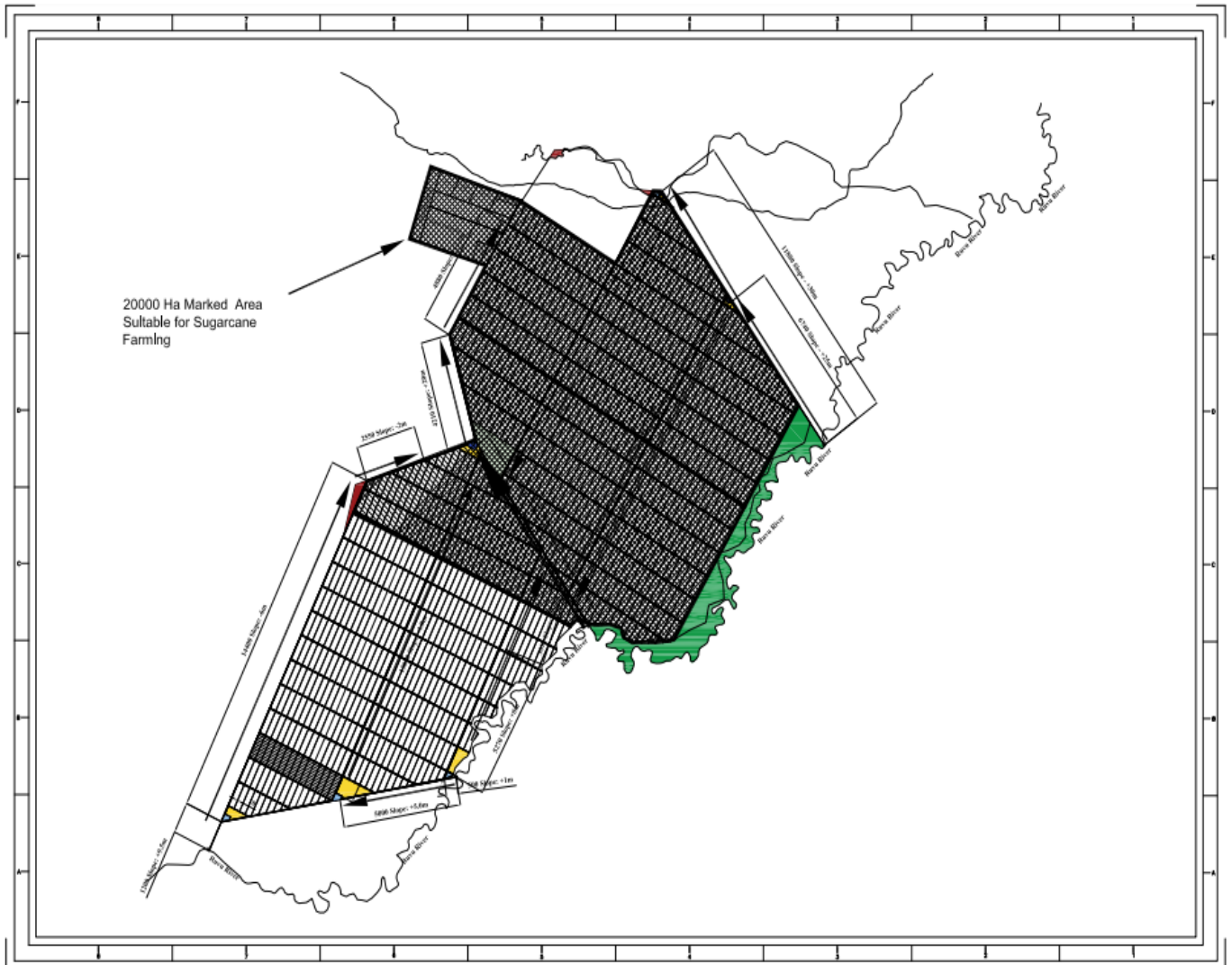
The prime objective of this project is to establish a cutting-edge sugarcane plantation spanning **20,000 hectares**, leveraging state-of-the-art technology to integrate advanced farming practices, innovative irrigation techniques, and smart agriculture methodologies. Note: The requested area is earmarked on the **Figure 2.0**.

**Figure 1: Layout of Land, Mkulazi Morogoro District, Morogoro Region**



The project adopts a holistic approach, encompassing the development of a 10,000-hectare nucleus estate and facilitating the cultivation of an additional 7,000 hectares through an out-growers scheme (remaining 3,000 hectares area will be dedicated to irrigation facility networks, roads, civil construction, farm facilities etc.). A pivotal aspect of this initiative involves the establishment of cooperative farming, targeting the development of **10,000 out-growers**.

**Figure 2: The requested area of 20,000 hectare is marked on the map**



Anticipated outcomes of this sugar project include the production of approximately 1,500,000 metric tons of sugarcane raw material from the sugarcane estate. To process this substantial raw material yield, the project envisions the implementation of state-of-the-art processing facilities at the project site, including:

1. Sugar Mill: With a daily processing capacity of 7,500 metric tons.
2. Refinery: With daily production capacity of 450 metric tons.
3. Distillery: With daily production capacity of 100 KLPD.
4. Power Plant: Generating 30 megawatts of power per hour.

Upon full operationalization, this integrated sugar complex is projected to yield impressive results, with an **estimated production output of 150,000 metric tons of sugar and a substantial 20 million litres of ethanol**. This multifaceted approach not only ensures

economic viability but also aligns with sustainability goals through the incorporation of advanced technologies and cooperative farming practices.

# METHODOLOGY

## SUGAR CANE ESTATE & OUTGROWERS DEVELOPMENT

Project Activities	Methodology
Land Development	<ul style="list-style-type: none"> <li>• Acquiring Environmental Clearance.</li> <li>• Identifying Buffer zone and Earmarking</li> <li>• Making Plot Layout based on Contour Survey</li> <li>• Bush clearing by Mechanical means</li> <li>• Ripping &amp; Land levelling</li> <li>• Removal of Rocks and Stumps</li> <li>• Forming Roads and Drainage infrastructure</li> <li>• Soil amelioration by application of Gypsum</li> <li>• Soil fertility improvement through Green Manuring</li> </ul>
Irrigation development	<ul style="list-style-type: none"> <li>• Developing water reservoir</li> <li>• Developing River Pump station</li> <li>• Developing Booster Pump station</li> <li>• Developing on-farm irrigation structures – Central Pivot, Drip and Flume Irrigation.</li> <li>• Installing Electric Sub Stations</li> <li>• Installing Pipeline, Electric lines and Transformer</li> <li>• Installing Diesel Generator at each pump station</li> </ul>
Seed Nursery Development	<ul style="list-style-type: none"> <li>• Identifying suitable sugarcane varieties for Mkulazi area</li> <li>• Identifying suitable area for nursery development</li> <li>• Identifying seed cane availability from Nearby sugar mills</li> <li>• Developing Tissue culture lab</li> <li>• Developing Seed Treatment Plant</li> <li>• Developing Green House and Poly House</li> <li>• Importing Natal Sugarcane Varieties from South Africa and Reunion.</li> <li>• Developing Foundation Nursery</li> <li>• Developing Commercial Nursery</li> </ul>

Project Activities	Methodology
Farm Mechanization	<ul style="list-style-type: none"> <li>• Establishing Central and Zonal Workshops with various bays</li> <li>• Establishing Fuel Station</li> <li>• Establishing Store House</li> <li>• Sourcing Suitable Farm Machineries and Equipment's</li> <li>• Sourcing Suitable Sugarcane Harvesters and Fleets</li> </ul>
Farm Infrastructure Development	<ul style="list-style-type: none"> <li>• Establishing Office Buildings</li> <li>• Establishing Residential area</li> <li>• Establishing Labour quarters</li> <li>• Establishing Primary Medical Centre</li> <li>• Establishing Training Centre</li> <li>• Establishing Canteen Facilities</li> <li>• Establishing Warehouses</li> <li>• Establishing Watch Tower</li> <li>• Establishing Sports Centre</li> <li>• Establishing Community Hall</li> </ul>
Crop Production in Nucleus Estate	<ul style="list-style-type: none"> <li>• Land Preparation</li> <li>• Planting</li> <li>• Gap Supply</li> <li>• Fertilization</li> <li>• Weed Management</li> <li>• Irrigation Management</li> <li>• Pest &amp; Disease Management</li> <li>• Inter-cultivation</li> <li>• Hilling Up</li> <li>• Drainage</li> </ul>
Out-Growers Scheme	<ul style="list-style-type: none"> <li>• Forming farmers Cooperatives Societies</li> <li>• Ear marking land for Out-Growers Farming</li> <li>• Capacity Building through Training &amp; Demonstration</li> </ul>

Project Activities	Methodology
	<ul style="list-style-type: none"> <li>• Providing Seed Cane, Agri. Machineries and Fertilizers on credit basis.</li> <li>• Providing Extension Services</li> </ul>
Harvest & Logistics	<ul style="list-style-type: none"> <li>• Sourcing Sugarcane Harvesters and Machineries</li> <li>• Developing Connecting Roads</li> <li>• Out-Sourcing Transport Fleet</li> <li>• Making Harvest Program</li> <li>• Harvest &amp; Logistics</li> </ul>
Digital Agriculture	<ul style="list-style-type: none"> <li>• Introduction of EMS program for Estate Management</li> <li>• Introduction of CMS program for Out-Growers Farms</li> <li>• Introduction of Smart Fleet for the Machinery Management</li> <li>• Introduction of Mobile App for the field Data collection</li> <li>• Introduction of Drone Survey and Satellite Monitoring System</li> </ul>
Capacity Building Activities	<ul style="list-style-type: none"> <li>• Training the local employees for sugarcane farming and estate management.</li> <li>• Training the operators for proper usage of heavy, medium, and light Machineries and Tractors</li> <li>• Training the local employees for Irrigation management</li> <li>• Training the farm labourers for the usage of tools and chemical spraying</li> <li>• Training for Safety, Health and Environment</li> <li>• Training the local employees for electrical and mechanical work</li> <li>• Training for Fire Fighting and Hazard management</li> </ul>

### ACTIVITIES FOR SETTING UP SUGAR COMPLEX

Activities	Methodology
Permitting and Regulatory Compliance	<ul style="list-style-type: none"> <li>• Obtain necessary permits and approvals from local authorities, environmental agencies, and regulatory bodies.</li> <li>• Ensure compliance with environmental regulations, land use laws, and safety standards.</li> </ul>

Activities	Methodology
Design and Engineering:	<ul style="list-style-type: none"> <li>• Develop a detailed engineering design for the sugar plant layout, including the mill, processing units, storage facilities, and administrative buildings.</li> <li>• Engage engineering firms or consultants specializing in sugar plant design to ensure efficient layout and optimal utilization of resources.</li> </ul>
Procurement of Equipment and Materials:	<ul style="list-style-type: none"> <li>• Identify and procure the necessary machinery, equipment, and materials required for sugar production, including sugar processing machinery, boilers, turbines, and conveyor systems.</li> <li>• Evaluate suppliers based on quality, cost, and reliability.</li> </ul>
Construction:	<ul style="list-style-type: none"> <li>• Prepare the construction site, including land clearing, leveling, and excavation as per the approved design.</li> <li>• Construct the infrastructure, including buildings, foundations, roads, and utilities.</li> <li>• Install and assemble the machinery and equipment according to the engineering specifications.</li> </ul>
Commissioning and Testing:	<ul style="list-style-type: none"> <li>• Conduct trials and tests to ensure that all equipment and systems function as intended.</li> <li>• Fine-tune the sugar processing operations and optimize the production process.</li> <li>• Train the operational staff on equipment operation, safety procedures, and maintenance practices.</li> </ul>
Start-Up and Operations:	<ul style="list-style-type: none"> <li>• Gradually ramp up production to full capacity while monitoring performance and quality parameters.</li> <li>• Implement quality control measures to ensure compliance with industry standards and product specifications.</li> <li>• Establish supply chain networks for sourcing sugarcane, transporting raw materials, and distributing finished products.</li> </ul>
Continuous Improvement and Maintenance:	<ul style="list-style-type: none"> <li>• Implement a preventive maintenance program to keep equipment and machinery in optimal condition.</li> <li>• Monitor operational efficiency and identify opportunities for process optimization and cost reduction.</li> <li>• Stay abreast of technological advancements and industry best practices to remain competitive in the market.</li> </ul>

Activities	Methodology
Environmental and Social Responsibility:	<ul style="list-style-type: none"><li>• Implement sustainable practices for waste management, water conservation, and energy efficiency.</li><li>• Engage with local communities and stakeholders to address social and environmental concerns and promote responsible business practices.</li></ul>
Marketing and Sales:	<ul style="list-style-type: none"><li>• Develop marketing strategies to promote the sugar products and expand market reach.</li><li>• Build relationships with distributors, retailers, and consumers to ensure a steady demand for the products.</li></ul>

# **PROJECT IMPLEMENTATION PLAN**

### *BASIS FOR PREPARATION OF PROPOSED PLAN:*

GCS team has visited the Mkulazi sugar project three times. Total fifteen experts have visited and spent about 1,000 man-hours to assess the possibilities of developing sugarcane estate and sugar complex. The attached project proposal has been prepared after elaborately following the below mentioned methodology:

- Field visit to survey the estate area - During the visit various data points on estate access, vegetation cover, water availability, river hydrology, irrigation water analysis, climatic factors, soil types, soil sample analysis, topography, sugarcane varieties, sugar and sugarcane production in Tanzania, agriculture implements and agro-inputs availability, etc., were collected.
- Field data analysis and collection of secondary data - Based on field data, information gathered during the visit and secondary data collected from reputable government organizations in Tanzania, GCS have prepared a detailed project which includes a complete layout of estate and year-wise development of sugarcane, farm infrastructure and irrigation facility development with complete cultivation practices on sugarcane.
- About the detailed project report (DPR) - The DPR critically examines the project feasibility and provides information on the following:
  - Information about general background of the country and Morogoro district (profile, neighbours, soils, climate, trade and investment, taxation, economy, agriculture, and water use policies, human power resources, etc.).
  - Analysis of primary and secondary data
  - Soil Investigation Study - Nutritional aspects of soils such as NPK<sup>7</sup> status and management of alkalinity and salinity have been studied.
  - Suitable drainage systems - Waterlogging and drainage during rainy season were identified. Elaborated plan for irrigation system were developed. Five locations on Ruvu River have been identified for implementation. Irrigation

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<sup>7</sup> NPK- Nitrogen, Phosphorus and Potassium

system covers transport of irrigation water from pump stations through pipeline/canal to different plots.

- Estate development plan - The estate development plan was prepared after analysing topographic data/photos obtained from satellite imagery, ortho-photo, area triangulation, Digital Terrene Model (DTM), Digital Elevated Model (DEM) and contours generated at 2, 5 and 10 M. Estate development plan and topographic studies covers total layout plan of crop by classifying them into 6 zones, 38 blocks and 28-34 plots in each complete block. The layout plan includes location of sugar complex, central workshops, zonal workshops, and residential area.
- List of machineries/ equipment required for agro-workshop were assessed - List of machineries required for mechanization of sugarcane cultivation/ crop husbandry is assessed. Harvest and transport system has been studied with list of harvesters and their operating aspects.
- Estate Management System (EMS) were identified - Activities of growing cane and harvest and management system were planned through computerization
- The manpower requirement/ management has been ascertained.
- The CAPEX<sup>8</sup> and OPEX<sup>9</sup> for entire estate development is worked out.

This DPR is available with us, and we would be obliged to discuss the findings of this DPR with you at the project award stage to cover any queries related to the project plan.

#### **LAND & IRRIGATION DEVELOPMENT PLAN: (Area – Ha)**

Table below provides the year-wise plan for land and Irrigation development over 5 years. Land development will include bush clearing, land levelling, field designing and providing the infrastructures like roads, field drainages, zonal residential complexes etc.

Activities	Unit	Year-1	Year-2	Year-3	Year-4	Year-5	Total
<b>Land Development</b>	Ha	2,500	5,000	5,000	5,000	2,500	20,000

<sup>8</sup> CAPEX- Capital Expenditure

<sup>9</sup> OPEX- Operational Expenditure

Activities	Unit	Year-1	Year-2	Year-3	Year-4	Year-5	Total
<b>Irrigation Development</b>	Ha	1,500	5,000	5,000	5,000	500	17,000

Out of the total land area of 20,000 hectares earmarked for the project, a designated portion of 17,000 hectares will be allocated for sugarcane cultivation purposes.

The remaining 3,000 hectares will be strategically utilized for the development of essential infrastructure, encompassing the establishment of the sugar complex, construction of roads, implementation of drainage systems, creation of residential zones, erection of office buildings, and the implementation of irrigation infrastructure.

This delineation ensures that a holistic approach is taken to optimize land usage, with due consideration given to both agricultural cultivation and the requisite support structures for the overall success of the project.

#### **CROP PRODUCTION PLAN FOR COMPLETE PLANTATION (In Area- Ha)**

Particulars	Year I	Year II	Year III	Year IV	Year V
<b>Seed Nursery</b>	200	1,000	1,000	800	800
<b>Plant</b>	-	200	5,000	5,200	4,000
<b>Ratoon I</b>	-	200	1,200	6,000	6,000
<b>Ratoon II</b>	-	-	160	1,000	5,300
<b>Ratoon III</b>	-	-	-	120	800
<b>Ratoon IV</b>	-	-	-	-	100
<b>Other ratoon</b>	-	-	-	-	-
<b>Total cane area</b>	200	1,400	7,360	13,120	17,000
<b>Millable cane area</b>	-	400	6,360	12,320	16,200

In the first year, the plan is to establish a 200-hectare seed nursery, with a subsequent multiplication ratio of 1:6. This means that 1,200 hectares will be planted using the seed cane produced in the nursery. In the following years, a 1,000-hectare seed nursery will be developed, producing enough seed cane to cultivate 6,000 hectares. By the fifth year, the cultivation area is projected to expand to 17,000 hectares.

#### **CROP PRODUCTION PLAN – NUCLEUS ESTATE (Area: Ha)**

Particulars	Year I	Year II	Year III	Year IV	Year V
Seed Nursery	200	1,000	1,000	800	800
Plant	-	200	2,500	2,500	2,000
Ratoon I	-	200	1,200	3,500	3,300
Ratoon II	-	-	160	1,000	3,000
Ratoon III	-	-	-	120	800
Ratoon IV	-	-	-	-	100
Other ratoon	-	-	-	-	-
<b>Total cane area</b>	<b>200</b>	<b>1,400</b>	<b>4,860</b>	<b>7,920</b>	<b>10,000</b>
<b>Millable cane area</b>	<b>-</b>	<b>400</b>	<b>3,860</b>	<b>7,120</b>	<b>9,200</b>

- The seed multiplication ratio is 1:6
- Seed cane development will be exclusively undertaken in the nucleus estate, emphasizing the paramount importance of maintaining high-quality seed cane.
- Approximately 10,000 hectares of land will be dedicated to sugarcane production in the nucleus estate, encompassing the production of seed nursery.
- By the fifth year of the project, the entire 10,000 hectares within the nucleus estate will be brought under sugarcane cultivation, marking the successful and comprehensive implementation of the planned cultivation strategy.

#### **CROP PRODUCTION PLAN – OUT GROWERS SCHEME (Area: Ha)**

Particulars	Year I	Year II	Year III	Year IV	Year V
Plant	-	-	2,500	2,700	2,000
Ratoon I	-	-		2,500	2,700
Ratoon II	-	-			2,300
Ratoon III	-	-	-		
Ratoon IV	-	-	-	-	
Other ratoon	-	-	-	-	-
<b>Total cane area</b>	<b>-</b>	<b>-</b>	<b>2,500</b>	<b>5,200</b>	<b>7,000</b>

Particulars	Year I	Year II	Year III	Year IV	Year V
Millable cane area	-	-	2,500	5,200	7,000

The development of out-growers is scheduled to commence in the third year of the project, coinciding with the attainment of a substantial area under irrigation. This strategic timeline ensures that the necessary groundwork is laid, including the establishment of irrigation infrastructure, before initiating the out-growers program.

#### PHASE WISE CANE PRODUCTION IN MT

Particulars	Yield / Ha -Mt	Year I	Year II	Year III	Year IV	Year V
Plant	100	-	20,000	500,000	520,000	400,000
Ratoon I	100	-	20,000	120,000	600,000	600,000
Ratoon II	85	-	-	13,600	85,000	450,500
Ratoon III	70	-	-	-	8,400	56,000
Ratoon IV	60	-	-	-	-	6,000
Other ratoon		-	-	-	-	-
<b>Total cane production</b>		-	<b>40,000</b>	<b>633,600</b>	<b>1,213,400</b>	<b>1,512,500</b>

By the end of the third year or the beginning of the fourth year, the project anticipates having 633 thousand tons of sugarcane available for milling. As the project progresses into the fifth year, the production is expected to significantly increase, reaching a target of 1.5 million tons of sugarcane. This trajectory reflects the planned growth and scale-up in sugarcane cultivation and processing over the specified timeline.

**SUGARCANE CROP PRODUCTION  
TECHNOLOGY**

Activities	Technology / Methods
Soil Amelioration to reduce the soil PH	Developing Good Drainage System Application of Gypsum Leaching the salts through surface irrigation
Soil Fertility Improvement	Green Manuring Application of Filter cake Trash Mulching
Preventing Soil Erosion	Cover Crops; Trash Mulching; Infield Drainage; Minimum Tillage
Sugarcane Varieties	N41, N46, N53, Co997, R579,
Seed Nursery Production	Foundation + Commercial Nursery Tissue culture seedlings Establishing HWT plant Pro Tray Method
Land Preparation	<b><u>First Planting</u></b> Ripping + Rome Plow + Harrow + Bed Forming <b><u>Second Planting</u></b> Minimum Tillage + Zonal Tillage
Planting	Mechanical Planting by using setts & Seedling
Spacing	1.8 M for Mechanical Harvesting
Irrigation Technology	<b><u>Undulating Terrain</u></b> Centre Pivot + Drip System + Hose Reel <b><u>Flat Terrain</u></b> Flume Irrigation
Fertilizer Programme	Based on Soil & Leaf Analysis
Plant Protection	Resistant Sugarcane Varieties Sett Treatment Soil Treatment with Neem cake Using Pseudomonas and Trichoderma Using Bio Control Agents Using Pheromone Trap Using Light Trap for Monitoring Usage of Eco Friendly Pesticides
Weed Management	Usage of Eco Friendly Herbicides Intercultivation Trash Mulching
Harvesting	Using Mechanical Harvester and Manual labourers.

## **7. BUDGET & RESOURCE REQUIRMENT**

## CAPEX REQUIREMENT FOR ESTATE DEVELOPMENT (Mn USD)

Section	Cost / Ha (USD)	Year-1	Year-2	Year-3	Year-4	Year-5	Total
Land Development	2,000	5.00	10.00	10.00	10.00	5.00	40.00
Irrigation Development	3,500	5.25	17.50	17.50	17.50	1.75	59.50
Agriculture Tractors and Heavy Equipment	1,000	1.50	5.00	5.00	5.00	0.50	17.00
Farm Infrastructure Development	500	1.25	2.50	2.50	2.50	1.25	10.00
Harvester & Transport Fleet	400	1.00	2.00	2.00	2.00	1.00	8.00
Agriculture Workshop	50	0.13	0.25	0.25	0.25	0.13	1.00
<b>Total</b>	<b>7,450</b>	<b>14.13</b>	<b>37.25</b>	<b>37.25</b>	<b>37.25</b>	<b>9.63</b>	<b>135.50</b>

The Capital Expenditure (CAPEX) for the project is structured as follows:

- In the first year, an initial CAPEX of USD 14.13 million is required.
- For the second, third, and fourth years, a consistent annual CAPEX of USD 37.25 million is anticipated.
- In the fifth year, a CAPEX of USD 10 million is projected.

The cumulative CAPEX requirement for the entire five-year period amounts to USD 135.5 million. This phased approach to capital investment reflects a detailed financial plan, ensuring adequate funding for each stage of the project's development.

## CAPEX REQUIREMENT FOR FACTORY

Section	Amount (Mn USD)	Remarks
<b>Sugar Mill + Power Plant</b>	88.6	7,500 TCD + 33 MW
<b>Refinery</b>	9.3	450 TPD
<b>Distillery</b>	30.6	100 KLPD (Molasses with incineration boiler)

Section	Amount (Mn USD)	Remarks
<b>Total</b>	<b>128.5</b>	

#### TOTAL CAPEX REQUIRED

Section	Amount (Mn USD)	Remarks
<b>Sugarcane Plantation Development</b>	135.5	20,000 Ha estate
<b>Sugar Complex</b>	128.5	7,500 TCD
<b>Total</b>	<b>264.0</b>	

#### RESOURCE REQUIREMENTS:

##### MAN POWER

S. No	Particulars	Type	No. of Employee	Remarks
<b>Sugarcane Plantation</b>				
1	Managers	Expat	15	
2	Managers	Local	30	
3	Supervisors	Local	60	
4	Technicians	Expat	10	
5	Technicians	Local	50	
6	Machinery Operator	Local	350	Including H & T Operators
7	Farm Labourers	Local	7,500	50 % Manual Harvesting
	<b>Total</b>		<b>8,015</b>	
<b>Sugar Complex</b>				
1	Managers	Expat	10	
2	Managers	Local	15	
3	Shift Engineer	Local	20	
4	Technicians	Expat	20	
5	Technicians	Local	20	
7	Operators	Local	120	

S. No	Particulars	Type	No. of Employee	Remarks
8	Skilled Labourers	Local	200	
9	Semi-Skilled Labourers		100	
	<b>Total</b>		<b>505</b>	
	<b>Grand Total</b>		<b>8,520</b>	

#### HEAVY EQUIPMENTS & TRACTORS FOR PLANTATION OPERATIONS

DETAILS	UNITS REQUIRED	REMARKS
D 8 Dozar	25	Bush clearing
Grader	5	
Rig Sprayer	3	
Excavator	10	
TLB	10	
Mechanical Harvester	10	
Haulage Fleet	70	7500 Cane Supply / Day
Tractors	170	1 Unit for 100 Ha

#### WATER REQUIRMENT:

Area (Ha)	Irrigation(mm/Day)	Per Day Water Req. (MCM)	Duration of Irrigation (Days)
17,000	8	1.35	200

The specified volume of irrigation water will be extracted from the Ruvu River through the establishment of a comprehensive infrastructure system. This will include the development of a pump station, reservoir, and associated irrigation structures. The pump station will be strategically designed to efficiently lift water from the Ruvu River, while the reservoir will serve as a storage facility to ensure a consistent and reliable water supply for irrigation purposes. Additionally, various irrigation structures like Drip, Pivot and Flume system will be implemented to distribute the water effectively across the designated agricultural areas, optimizing the overall irrigation process. Through the integration of these components, a robust and sustainable system will be created to support agricultural activities and enhance water resource management from the Ruvu River.

#### POWER REQUIRMENT

Section	Qty. Required / Hr	Remarks
<b>Agriculture</b>	13 MW	
<b>Sugar Complex</b>	9 MW	
<b>Total</b>	<b>22 MW</b>	

The stipulated power demand will be fulfilled through a captive power plant with a capacity of 30 MW. This power plant is specifically designed to meet the energy requirements of the project. Notably, there will be a surplus power generation of ~~8~~ 8 MW beyond the project's needs. This excess electricity will be seamlessly integrated into the National Grid, contributing to the broader energy supply infrastructure. By exporting the surplus power, the project not only ensures self-sufficiency but also makes a valuable contribution to the national energy grid, promoting sustainability and efficient resource utilization.

## 8. TARGET AUDIENCE & BENEFICIARIES

The beneficiaries of a sugar project extend across various sectors, fostering a ripple effect of positive impacts.

#### **Tanzania Government:**

- **Economic Boost:** The government can anticipate substantial revenue from taxes, levies, and export earnings. This revenue can be channelled into public services, infrastructure development, and social welfare programs, contributing to overall economic growth.
- **Employment Opportunities:** The project's extensive workforce requirements create job opportunities, addressing unemployment concerns and fostering social stability.
- **Foreign Relations:** By becoming a net exporter of sugar, Tanzania can strengthen diplomatic ties with nearby sugar-deficit countries, showcasing its capacity to contribute to regional economic stability.

#### **Nearby Sugar Deficit Countries:**

- **Regional Economic Stability:** Tanzania's large-scale sugarcane production can help meet the sugar demand of neighbouring countries facing deficits, promoting regional economic stability, and reducing the need for costly sugar imports.
- **Trade Relations:** The project opens avenues for mutually beneficial trade relationships, potentially leading to collaborative initiatives in other sectors and strengthening regional economic integration.

#### **Sugar Sector:**

- **Increased Production:** Large-scale sugarcane agriculture boosts overall sugar production, making Tanzania more self-sufficient and less dependent on imports. This reduces vulnerability to international market fluctuations and enhances the stability of the domestic sugar sector.
- **Enhanced Competitiveness:** The increased scale allows for economies of scale, making the sugar sector more competitive globally. This competitiveness can attract foreign investments and create a conducive environment for sectoral growth.

#### **General Public:**

- **Stable Sugar Supply:** The project ensures a steady and reliable supply of sugar in the domestic market, contributing to price stability and food security for the public.

#### **Local Community**

- **Community Development:** The project necessitates local labour and services, leading to improved infrastructure, education, and healthcare facilities in the surrounding communities.
- **Increased Income:** Local farmers benefit from increased income opportunities by participating in sugarcane cultivation, leading to poverty alleviation and improved living standards.

#### **Service Providers**

- **Business Growth:** Local service providers, such as transportation, logistics, and equipment suppliers, experience increased demand for their services, resulting in business growth.
- **Diversification of Services:** The project presents opportunities for service providers to diversify their offerings and collaborate with other industries within the agricultural value chain.

#### **Supporting Sectors & Allied Industries**

- **Diversification Opportunities:** Allied industries, such as packaging, research, and technology, can explore diversification opportunities and benefit from increased collaboration with the growing sugarcane sector.
- **Innovation and Technology Transfer:** The project may stimulate innovation and technology transfer, creating a ripple effect across supporting sectors and encouraging sustainable practices.

## 9. EXPECTED OUTCOMES & IMPACT

Sugar industry plays a major role for the development of rural economy of any country. An integrated sugar complex with nucleus estate and out-growers will have huge impact on socio – economic development and livelihood improvement of the local population. **The most important local benefit would be the generation of direct and indirect employment in sugarcane plantation and sugar complex.** It also accelerates the development of infrastructures like road connectivity, electricity supply, communication facilities, hospitals, schools and drinking water etc.

It also develops the supporting industries like fertilizer shop, agro-input supplier, transporters, tractor dealers, machinery suppliers, civil contractors, electric contractors, labor contractors, road contractors, restaurant's, grocery shops, etc. The following are major benefits of the sugar project.

#### **SUGAR, ETHANOL & POWER PRODUCTION:**

Sugar Production	-	150,000 Mt per annum
Ethanol Production	-	20 Million Litres
Power to National Grid	-	52,800 MW Per annum

#### **EMPLOYMENT GENERATION**

Direct Employment	-	8,500
Indirect Employment	-	10,000
Total Employment	-	18,500

#### **REVENUE GENERATION FROM THE FACTORY PER ANNUM**

Sugar	-	USD 105 Mn
Ethanol	-	USD 14 Mn
Power	-	USD 5.2 Mn
Total	-	USD 124 Mn per annum

#### **Other Social Impacts**

##### **DEVELOPMENT OF LOCAL INFRASTRUCTURE**

Development of road network, communication facilities, power connection, schools,

hospitals, and banking facilities etc.

### **Development of Supporting Industries and Local business**

Development of transport industry, civil industry, ancillary Industries, fertilizer shops, agro-inputs, spare parts suppliers, restaurants, hotels, pharmaceuticals, service providers, fuel stations, auto mobiles, vehicle service station and driving school.

### **Skill Development**

Tractor operations, heavy equipment operation, farming skills, implement fabrication, repairing of machineries, irrigation machinery operation, computer skills, communication skills, electrical work, plumbing work, sugar Mill operation, distillery operations and power plant operations etc.

### **Capacity building for out growers**

Technical knowledge, irrigation infrastructure, access to farm machineries, agro-inputs, credit facilities, etc.

### **Increased Food and Nutrition Security**

Along with sugarcane other short term agricultural crops like legumes, vegetables and cereals can be grown. It increases the availability of food crops in the local market and food & nutrition security is ensured.

### **Increased Money Circulation**

It is estimated that USD 1.0 to 1.5 million cash will be in circulation every month in the sugar mill region through employment.

### **Increased Energy Security**

Power generation and Ethanol production will increase the Energy security of the country.

10. PROJECT IMPLEMENTATION  
SCHEDULE EXPECTED OUTCOMES &  
IMPACT

## SUGARCANE ESTATE DEVELOPMENT SCHEDULE

Activities	Duration (Day)	Year I	Year II	Year III	Year IV	Year V
Preparing Tender and Inviting Bid for Land development, Irrigation development, supply of farm machineries, Agri – Inputs and Developing Farm infrastructure.	120	↔				
Finalizing The Bid	60	↔				
Land Development	1000	←	→			
Irrigation Development	1000	←	→			
Farm Infrastructure Development	1000	←	→			
Seed Nursery Production	1000	←	→			
Nucleus Estate Crop Production	800		←	→		
Out Growers Cane Development	600			←	→	
Harvest & Logistics	600				←	→

This table outlines the designated timeframes for a range of activities, shedding light on the intricate planning and execution of the agricultural project. During the initial 120 days, the focus will be on tender preparation and bid invitation, followed by a 60-day period for finalizing the bid. Moving into the seventh month, both land development and irrigation development will commence. Concurrently, a seed nursery spanning 200 hectares is planned for establishment within the first year. This structured timeline provides a clear understanding of the project's sequential progression and key milestones.

## SUGAR COMPLEX DEVELOPMENT SCHEDULE

S. No.	Task	YEAR I	YEAR II	YEAR III
1	Tender preparation and inviting bids for Plant and machinery and Finalization of Bids and placing of order	100%		
2	Civil designing and drawings	25%	75%	
3	Civil Works completion		100%	

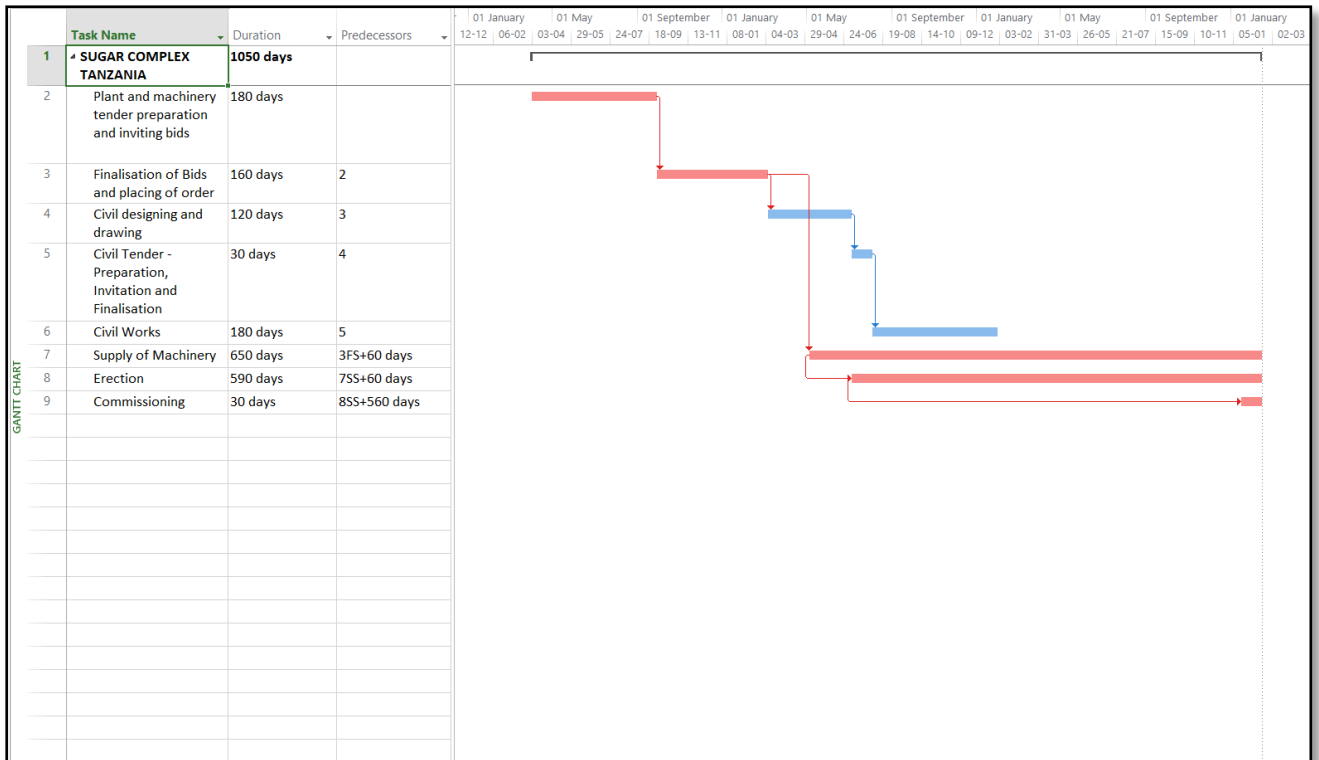
S. No.	Task	YEAR I	YEAR II	YEAR III
4	Supply of Machinery		45%	55%
5	Erection		40%	60%
6	Commissioning			100%

The initial sugar plant is designed with a capacity of 7,500 TCD, yielding a daily production of 900 TPD raw sugar. Within this, 450 TPD will be directed to the backend refinery for the production of refined sugar. The plant is scheduled to operate at the 7,500 TCD capacity for the first 200 days of each season, with an adjustment of working days based on the fluctuations in sugarcane production.

The proposed technology for the partial refinery involves phosphotation, followed by the use of Powdered Activated Carbon (PAC) to achieve the production of refined sugar. The power plant's initial capacity is set at 30 MW, featuring a 2x130 TPH boiler with an 87 ATA pressure specifically designed for the 7,500 TCD capacity.

The co-generation plant is strategically planned to fulfil the steam and power requirements for both raw sugar and refined sugar production. Excess bagasse generated during the season will be utilized for steam and power generation, with surplus output allocated for use in the distillery and for export during the off-season. The entirety of the power needed for farm operations will be supplied by the captive power plant during plant operation. This comprehensive approach ensures efficient utilization of resources for both sugar and power production throughout the operational cycles.

# GANTT CHART FOR SUGAR COMPLEX



**11.EXPERIENCE IN SUGARCANE  
DEVELOPMENT & SUGAR  
PRODUCTIONT**

**The experience of each Joint Venture (JV) member in sugarcane activities and sugar production is provided below:**

### **Egyptian Sugar and Integrated Industries Company (ESIIC)**

The Egyptian Sugar and Integrated Industries Company (ESIIC) is actively engaged in operation of sugar complexes, sugarcane plantation and distillery units across 18 locations in Egypt. The organization has made significant strides in various facets of the sugar industry, demonstrating a noteworthy commitment to sugarcane estate development, sugarcane farm management, and sugar production in key projects. The summary of ESIIC's accomplishments in these areas is outlined below:

#### **1. Quantum of Land Developed:**

ESIIC has successfully developed an expansive land area totalling **141,640 hectares**. This underscores the company's dedication to enhancing and optimizing sugarcane cultivation across its operational sites.

#### **2. Quantum of Sugarcane under Cultivation:**

In each growing season, ESIIC manages an impressive **117,359 hectares** of sugarcane cultivation. This reflects the company's proficiency in efficiently utilizing the developed land for sustained and substantial sugarcane production.

#### **3. Quantum of Sugar Produced Per Annum:**

ESIIC's major projects contribute significantly to the annual sugar production, yielding an impressive **860,000 metric tons**. This substantial output underscores the company's proficiency in the entire sugar production process, from cultivation to processing.

ESIIC's strategic presence and operational excellence in these key areas underscore its pivotal role in contributing to the thriving sugar industry in Egypt. The company's commitment to sustainable practices and effective management across its various projects position it as a key player in the region's sugarcane and sugar production landscape.

### **Global Canesugar Services Pvt. Ltd.**

Global Cane Sugar (GCS) has demonstrated commendable expertise in various aspects of the sugar industry, encompassing sugarcane estate development, sugarcane farm

management, sugar production, co-generation of power, and alcohol production in several major projects. The achievements in these domains are summarized as follows:

#### Details of major sugarcane estate development projects handled by GCS

S. No.	Particulars of Factory	Quantum of Land Developed (hectares)	Sugarcane Production per annum (MMT)
1.	SBSL, Sierra Leone	10,000	800,000
2.	GUYSUCO, Guyana	16,000	1,120,000
3.	Seprod, Jamaica	3,800	247,000
4.	Horyal, Uganda	4,400	360,800
5.	AECI, Philippines	2,000	180,000
6.	WNCS, Sudan	10,000	620,000
	<b>Total</b>	<b>46,200</b>	<b>3,327,800</b>

#### Details of major sugar projects handled by GCS

S. No.	Particulars of Factory	Cane Crushing Capacity (TCD)	Sugar production per annum (MMT)
1.	Karun Agro, Iran	24,000	403,200
2.	Kimawi Group, Vietnam Unit: Son La, Unit: Tra Vinh, Unit: Tuy Hoa & Unit: Kon Tum	14,000	252,000
3.	Warna Sugar, Maharashtra, India	10,000	180,000
4.	Baramati Agro Ltd, Unit 1 & 2, Maharashtra, India	16500	297,000
5.	Haryana Sugar Federation, Unit: Rohtak, Unit: Assandh, Unit:Palwal, Unit: Jind, Unit: Panipat, Unit: Sonipat & Unit: Shahabad	18,700	336,600
	<b>Total</b>	<b>83,200</b>	<b>1,468,800</b>

#### Details of major Sugar Refinery projects handled by GCS

S. No.	Particulars of Factory	Capacity (TPD)	Sugar Production per annum (MT)
1.	GoldStar Refinery, Zimbabwe	600	108,000

S. No.	Particulars of Factory	Capacity (TPD)	Sugar Production per annum (MT)
2.	Son La Refinery, Vietnam	500	90,000
3.	Haryana Co-operative, Rohtak	450	81,000
4.	Everest Sugar, Nepal	500	90,000
5.	Warna Refinery, Maharashtra	1,000	180,000
	<b>Total</b>	<b>3,050</b>	<b>549,000</b>

Order/ work order of above projects mentioned in **Annexure**

#### Details of major Co-generation projects handled by GCS

S. No	Factories and their location	Capacity (MWh)	Annual Power Production (MWh)
1	Naraingarh Sugar, Haryana	25	108,000
2	Mysore Sugar, Mandya	30	129,600
3	Superior Foods (IREDA), UP	33	142,560
4	EID Parry, Haliyal	18.55	80,136
5	Utech Sugar (IREDA), Maharashtra	14.90	64,368
	<b>Total</b>	<b>121.45</b>	<b>524,664</b>

#### Details of major Distillery projects handled

S. No.	Factories and their location	Capacity (KLPD)	Annual Ethanol Production (KLPD)
1	Vijaynagar Sugar	120	32,400
2	EIBPL, Purnia, Bihar	65	19,500
3	Satpuda Tapi	75	20,250
4	RSGSM, Sri Ganganagar	30	9,000
5	NSL, Koppa & Krishnaveni	135	36,450
	<b>Total</b>	<b>370</b>	<b>117,600</b>

#### 1. Quantum of Land Developed:

GCS has effectively developed 46,200 hectares of land, showcasing the company's commitment to expanding and optimizing sugarcane cultivation areas.

#### 2. Quantum of Sugarcane Produced Per Annum:

GCS consistently achieves an impressive annual sugarcane production of 3,327,800 metric tons, indicating the company's proficiency in cultivating substantial quantities of sugarcane.

### **3. Quantum of Sugar Produced Per Annum:**

The annual sugar production by GCS stands at a substantial 1,468,800 metric tons, highlighting the company's capability in efficiently processing sugarcane into high-quality sugar.

### **4. Quantum of Refined Sugar Production per Annum:**

GCS specializes in refined sugar production, contributing significantly to an annual output of 549,000 metric tons. This underscores the company's focus on producing refined sugar products.

### **5. Quantum of Co-Generation of Power per Annum:**

GCS actively engages in co-generation of power, generating an impressive 524,664 megawatt-hours annually. This demonstrates the company's commitment to sustainable practices through the efficient utilization of by-products.

### **6. Quantum of Alcohol Production per Annum:**

GCS is a key player in alcohol production, achieving an annual production volume of 117,600 KLPD. This further diversifies the company's contributions within the sugar industry.

It is important to note that the sugarcane project and sugar project undertaken by GCS involve distinct clients. This emphasizes GCS's versatility and ability to cater to the diverse needs of different clients, showcasing the company's comprehensive capabilities across various facets of the sugar and allied industries.

## **Eagle Hills - Net Worth for the Previous Six (6) Financial Years**

Please refer to the table below, the book value of equity of Eagle Hills increased from **US\$ 970.2 Mn** in 2016 to **US\$ 2.02 Bn** in 2022 (for financial year ending in December). Over the mentioned period 2016-2022 the book value of equity of Eagle Hills increased at a CAGR<sup>10</sup> of **c.13.0%**.

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<sup>10</sup> CAGR: Cumulative Average Growth Rate

Year (In Mn)	2017	2018	2019	2020	2021	2022
Current Assets	2,088.4	2,318.2	2,151.8	2,340.4	2,257.5	2,752.6
Non-Current Assets	177.6	186.8	926.4	1,351.1	1,777.4	1,856.7
Total Assets	2,266.0	2,504.9	3,078.2	3,691.5	4,034.8	4,609.4
Total Liabilities	1,028.6	1,249.2	1,120.9	1,370.8	1,388.7	2,587.7
Total Debt	124.1	202.2	415.4	734.9	773.7	809.9
Total Equity Value	<b>1,113.3</b>	<b>1,255.7</b>	<b>1,541.9</b>	<b>1,585.8</b>	<b>1,872.3</b>	<b>2,021.6</b>

The Primary Bidder of the Consortium – Eagle Hills, will lead the execution of entire project financially. As depicted in table above, Eagle Hills has the in-house capability of supporting the project financially on stand-alone basis, still to improve the returns to the equity holders' suitable level of debt financing will be arranged from international/ local banks.

Eagle Hills is fully capable of arranging such project financing for the benefit of the project.

## **12. IMPLEMENTING OUT-GROWER MODELS**

The development of out-growers is scheduled to commence in the third year of the project, coinciding with the attainment of a substantial area under irrigation. This strategic timeline ensures that the necessary groundwork is laid, including the establishment of irrigation infrastructure, before initiating the out-growers program.

**CROP PRODUCTION PLAN – OUT GROWERS SCHEME (Area: Ha)**

Particulars	Year I	Year II	Year III	Year IV	Year V
Plant	-	-	2,500	2,700	2,000
Ratoon I	-	-		2,500	2,700
Ratoon II	-	-			2,300
Ratoon III	-	-	-		
Ratoon IV	-	-	-	-	
Other ratoons	-	-	-	-	-
Total cane area	-	-	2,500	5,200	7,000
<b>Millable cane area</b>	-	-	<b>2,500</b>	<b>5,200</b>	<b>7,000</b>

Cooperative farming model for out grower schemes is proposed with the following details:

- The factory will develop the land and allocate parcels to cooperatives, which will then assign them to farmers for sugarcane cultivation.
- Resources like tractors and machinery will be centralized under cooperatives.
- Cooperatives will handle cane registration, machinery allocation, seed and agro-input loans, training, and technical support with assistance from the sugar mill and bank.
- Cooperatives will ensure loan recovery from farmers through a tripartite agreement.
- An Out Growers Cane Manager from the sugar mill will liaise with cooperatives and farmers.
- The OG Manager will provide extension services, field demonstrations, and farmer training through cooperatives.
- Regular field visits by the OG Manager will offer technical guidance to farmers.
- The OG Manager will monitor cooperatives and farmers for cane harvest and supply.
- Cooperatives will submit crop details to the OG Manager weekly.

- Cane supply tickets will be issued to cooperatives by the OG Manager based on age and variety.
- Farmer payments will be based on tonnage or quality according to Tanzanian government guidelines, issued weekly or fortnightly after loan deductions.
- Payment disbursements will be overseen by the OG Manager.

### **IMPACT OF OUT-GROWERS CANE DEVELOPMENT**

1. Improvement in standard of living
2. Improvement in Livelihood.
3. Infrastructure development – Road, Electricity, Drainage, Health care, Communication, Transport, School etc.
4. Capacity building through farmers training, infrastructure development and access to the credit facilities,
5. Employment generation
6. Development of supporting industry like fertilizer dealer, Agro-Input dealer, Transport industry, Civil industry, Ancillary Industries, Fertilizer shops, Agro-Inputs, Spare parts suppliers, Restaurants, Hotels, Pharmaceuticals, Service Providers, Fuel Stations, Auto Mobiles, Vehicle Service station and Driving school.

### **EXPERIENCE OF GSC IN OUT GROWERS MODEL:**

In India, six million farmers are cultivating sugarcane through Out Growers Scheme and Producing 380 million tons of sugarcane per annum. This Out Growers and Sugar Mill enter into the buy-back agreements with certain terms and conditions. Sugar mills arrange credit facilities through banks and providing agricultural inputs, training, and capacity-building activities. This symbiotic relationship ensures a reliable supply chain and mutually beneficial collaboration between sugar mills and farmers. GCS has vast experience in implementing Out Growers scheme.

During the GCS team's visit to Mkulazi Estate, local smallholders in mid-way areas and nearby villages expressed a strong interest in enhancing their livelihoods through farming. Some are currently cultivating small-scale sugarcane, selling it locally for modest earnings. With the favourable climate and ample water in Tanzania, smallholder participation in sugarcane cultivation appears promising.

However, these farmers face challenges due to limited capital for fertilizers and equipment, relying on rain for irrigation. To overcome this, participation in out-grower models, also known as contract farming, facilitated by private sugar factories, is a viable solution. The out-grower cane model involves local farmers supplying sugarcane to the sugar mill, differing from the estate model.

The development of sugarcane through Out Growers Model in the sugar mill extends overall regional development. This includes the livelihood development, infrastructure development, such as roads, electricity, healthcare, schools, irrigation facilities, and other supporting industry.

The revenue influx from the sugarcane estate development and sugar complex commissioning is expected to catalyse socio-economic development in the Mkulazi province. The project aims to:

This holistic approach not only elevates the livelihoods of the local population but also positions the project as a catalyst for multifaceted progress, encompassing economic, social, and infrastructural dimensions. Furthermore, it aligns with the global trend of out-grower models, emphasizing the importance of collaborative efforts in sugarcane production and supply worldwide.

#### **EXPERIENCE OF GCS TEAM WITH OUT-GROWERS CANE DEVELOPMENT**

<b>Name</b>	<b>Out-Growers Experience</b>	<b>Sugar Mills</b>	<b>No. of Out-Growers</b>
Dr.G.S.C. Rao, Managing Director	42 Years	Managing Director, GCS Former Executive Director and CEO of Three major sugar groups	150,000 (Ten Sugar Mills)
Dr. J.P. Singh, Technical Advisor	35 Years	National Cooperative Federation for Sugar Factories, India	200,000 farmers in on an average 20 sugar mills and above
A. Selvaraj, Principal Consultant	23 Years	E.I.D Parry India Ltd, India	4,500
		Ambika Sugars Ltd, India	5,000
		NIVL, Vietnam	7,500
		Golden Grove Sugars, Jamaica	650
Mr. SudhirKumar, Chief Cane Manager	35 Years	Shimbaoli Sugars Ltd, India	22,000
Mr. Yash Pal Singh, Cane Development Manager	30 Years	Riga Sugar Mills, India	14,000
		Kareli Sugars Mills Pvt Ltd	17,000
		Simbhaoli Sugars Ltd	12,000

Name	Out-Growers Experience	Sugar Mills	No. of Out-Growers
Mr. Dignpal Sirohi, Cane Development Manager	35 Years	Yadu Sugar Mills, India	16,000
		Shimbaoli Sugars Ltd, India	14,000

GCS has Scientific Associates about 10 experts for out-grower cane development programmes.

## **13. DEVELOPMENT VISION**

## **ALIGNMENT TO THE TANZANIA DEVELOPMENT VISION 2025 AND NATIONAL 5 YEAR DEVELOPMENT PLAN**

The Ministry of Agriculture in Tanzania has set an ambitious goal of achieving a sugar output of 750,000 tonnes by 2025, catering to both domestic and regional demands. Aligned with Tanzania's '3rd Five Years Development Plan' for 2021/22 to 2025/26, a pivotal aspect of this initiative is the establishment of a sugar mill with a production capacity of 200,000 tonnes per year at Mkulazi Ngerengere in the Morogoro region.

This project involves the utilization of 20,000 hectares of land to establish a sugarcane estate and a sugar processing complex, equipped with state-of-the-art facilities to produce 150,000 metric tons of sugar annually. The proposed facilities include:

- Sugarcane milling plant with a capacity of 7,500 TCD (Tons of Cane per Day)
- Raw sugar plant with a capacity of 900 TPD (Tons Per Day)
- Backend refinery with a capacity of 450 TPD
- Co-generation plant generating 30MW of power

This comprehensive project not only supports the Ministry of Agriculture's sugar production target but also aligns seamlessly with the objectives outlined in Tanzania's '3rd Five Years Development Plan.' The proposed facilities ensure efficient sugarcane processing and contribute significantly to both local and regional sugar demands.

## **15. ECONOMICS & SOCIAL BENEFITS**

**VALUE FOR MONEY IN TERMS OF BENEFITS TO THE GOVERNMENT OF TANZANIA INCLUDING ECONOMIC DEVELOPMENT STIMULATION, INCREASE OF EXPORT / IMPORT SUBSTITUTION. EMPLOYMENT AND ECONOMIC BOOST. DEVELOPMENT OF RESOURCES AND RESOURCE TRANSFER, INCREASED PRODUCTION, AND INCREASED COUNTRIES INCOME**

Sugar industry plays a major role for the development of rural economy of any country. An integrated sugar complex with nucleus estate and out-growers will have huge impact on Socio – Economic development and Livelihood improvement of the local population. **The most important local benefit would be the Generation of Direct and Indirect Employment in Sugarcane Plantation and Sugar Complex.** It also accelerates the development of infrastructures like road connectivity, electricity supply, communication facilities, hospitals, schools and drinking water etc.

It also develops the supporting industries like fertilizer shop, Agro-Input Supplier, Transporters, Tractor dealers, Machinery suppliers, Civil Contractors, Electric Contractors, Labor contractors, Road contractors, Restaurant's, Grocery shops and etc. The following are major benefits of the sugar project.

**INCREASED SUGAR, ETHANOL & POWER PRODUCTION:**

Sugar Production	-	150,000 Mt per annum
Ethanol Production	-	20 Million Litres
Power to National Grid	-	52,800 MW Per annum

The production of 150,000 metric tons of sugar will significantly diminish Tanzania Government's reliance on sugar imports, thereby saving foreign exchange amounting to 105 million USD per annum. This initiative is aligned with the goal of enhancing economic self-sufficiency and promoting financial stability.

Furthermore, the production of 20 million litres of ethanol is poised to meet the domestic needs of the pharmaceutical, fuel, and food industries, contributing to national self-reliance. Additionally, this endeavour is expected to spur the development of ancillary industries such as acetic acid and citric acid plants, fostering a diversified and robust industrial ecosystem.

Moreover, the surplus power supply to the National Grid, totalling 52,800 megawatt-hours per annum, holds the potential to fortify the energy security of the country. This surplus power enhancing the resilience of Tanzania's energy infrastructure.

### **EMPLOYMENT GENERATION**

Direct Employment	-	8500
Indirect Employment	-	10000
Total Employment	-	18500

### **REVENUE GENERATION FROM THE FACTORY PER ANNUM**

Sugar	-	105 M.USD
Ethanol	-	14 M.USD
Power	-	5.2 M.USD
Total	-	124 M.USD PER Annum

#### **Development of local infrastructure**

Development of road network, Communication facilities, Power Connection, Schools, Hospitals and Banking facilities etc.

#### **Development of Supporting Industries and Local business**

Development of Transport industry, Civil industry, Ancillary Industries, Fertilizer shops, Agro-Inputs, Spare parts suppliers, Restaurants, Hotels, Pharmaceuticals, Service Providers, Fuel Stations, Auto Mobiles, Vehicle Service station and Driving school.

#### **Skill Development**

Tractor Operations, Heavy equipment operation, farming skills, Implement Fabrication, Repairing of Machineries, Irrigation Machinery Operation, Computer skills, Communication skills, Electrical work, Plumbing work, Sugar Mill Operation, Distillery Operations and Power Plant Operations etc.

#### **Capacity building for out growers**

Technical Knowledge, Irrigation infrastructure, Access to farm machineries, Agro-Inputs, Credit facilities and etc.

#### **Increased Food and Nutrition Security**

Along with sugarcane other short term agricultural crops like legumes, vegetables and