AfricaOrama Limited

Business Plan

Agriculture Development Project
Lindi Region, Kilwa, Tanzania

30 November 2020

OVERVIEW

AfricaOrama Limited (hereinafter, "AfricaOrama"), a company registered in Tanzania (Certificate of Incorporation Nº 142017687) (APPENDIX I) and having as its address Plot Nº 403/1, Msasani Peninsula, Kinondoni, Dar Es Salaam, Tanzania was organized to develop sustainable, large-scale, mechanized agriculture projects, initially, in the Lindi region of Kilwa. Its first project is to clear and plant 13.644 (thirteen thousand six hundred forty-four) hectares over a period of 4 (four) years. Crops grown will include soybean, sesame, sunflower, sorghum, maize, corn, and beans.

The project site is located 286 km south of Dar Es Salaam, bordered on the east by TA main highway and approximately 28 km west of an accessible port on the Indian Ocean. The projected cost for Phase I is USD 8,399,329.00 (Eight million three hundred ninety-nine thousand, three hundred twenty-nine dollars) to be financed by private, foreign investors.

AfricaOrama's project is expected comply with certain United Nations social and environmental objectives by providing additional food security to combat hunger in local and regional economies, delivering education through on-the-job skills training and, importantly, achieving sustainable agricultural development on a large scale.

Investors based in the U.S. will provide up to USD 9,700,000.00 to develop Phases I and II of the project or 5,000 of the 12,000 hectares to be planted. The balance of funds needed to complete the project will be derived from a combination of internally generated sources and additional investment from shareholders.

AfricaOrama expects to import new, state-of-the-art tractors and farm implements including disc plows, planters, sprayers, and harvesters. To minimize downtime and maximize productivity, the company will purchase a full complement of spare parts, tools and equipment for maintaining and repairing its equipment at the site. Seeds, fertilizers, pesticides and herbicides are expected to be sourced within Tanzania or, if necessary, imported. The company plans to sell its production to large, domestic consumers as well as in foreign markets. The project also intends to sponsor projects that advance education, health and infrastructure development in local and regional communities.

The project site is native land, characterized by tall, thick grasses and trees and is part of approximately 890,000 hectares of contiguous open space (APPENDIX II). The area is largely undeveloped with agriculture being conducted only on small, family owned and operated farms. As such, AfricaOrama's project will be the first, large-scale, agricultural development in Kilwa.

Generally, the project enjoys the support of regional and federal government agencies and elected officials and is expected to receive all necessary environmental approvals from the National Environmental Management Council and Occupational Safety and Health Authority. The 13,644-hectare project site for AfricaOrama's project is currently controlled by the Migeregere and Kikole Villages. The project has been approved by both the Councils of both Villages and, once the company complies with the remaining government and Tanzania Investment Centre (TIC) requirements, it hopes to secure a 98-year land lease title issued by TIC.

The project will benefit from the expected increase in near and medium-term demand for additional food supplies both within Tanzania and within regional economies. Due to relatively strong and steady economic growth, healthy annual population growth and the development of consumer staples industry, demand for AfricaOrama's production is expected to be strong in Tanzania.

Tanzania's location within the region and access to seaborne transport provides access to foreign consumer staple markets including other countries within Africa, middle eastern countries, and India. The project site is located 28 km from a dormant port facility which, with capital investment to improve access, and for loading equipment and storage facilities, could offer a significant logistical advantage for transporting agricultural products within the region. Until that port becomes operational, the company expects to import equipment and materials to and export agricultural products from the port in Dar Es Salaam.

AfricaOrama's long-term business objective is to scale-up the project by acquiring additional 98-year, land lease titles on up to 50,000 hectares, hire and train a stable, competent, local work force, and vertically integrate its operations to include grain storage facilities, truck transport loading and port facilities. At the same time, the company will strive to integrate operations and business practices to conform with the values and ethos within local and regional communities.

ABOUT

AfricaOrama (organized June 30, 2020) is a newly formed company founded by a group mostly, young, talented farmers, knowledgeable and passionate about agriculture, crop management, equipment and equipment maintenance and repair. The team is highly motivated and possesses the requisite skills and experience to develop and sustain a successful, long-term business. Operationally, the team has more than a decade of experience in soil preparation, seed varietal selection, pest/disease control, equipment and equipment maintenance to achieve overall project goals and timely, production targets. The team's Tanzanian staff brings know-how in soil management, agronomy, government and community relations and production off-take. A dedicated, experienced financial team will oversee budgeting, purchasing, cost control and administration. The company will be led by a seasoned, experienced manager of large-scale agriculture projects.

The core of the team is worldly, having actively managed and participated in the development of large agriculture and land conversion projects including: 2,500 hectares of corn, wheat, soybean, mustard and sorghum in Italy; multiple large-scale, land conversion projects in Australia and Brazil; grape farming in Switzerland; and as chief technical advisor to global clients of a U.S. based Agroforestry equipment manufacturer on land-conversion projects.

Day to day operations will be managed by the company's officers while a separate Board of Directors will establish policy, set objectives, provide guidance, and identify and implement strong governance and anti-corruption practices. The Board shall be comprised of shareholders as well as independent directors having experience in management, African business, agriculture, commodities, and trade.

LAND RESOURCES

The Tanzanian government supported by the Tanzanian Investment Centre (TIC) has developed programs designed to spur agricultural development, create jobs, and boost economic development. Land in Tanzania is owned exclusively by the government and is controlled by the Land Acts of 1999 and 2002 and the Village Land Act of 2002. Government programs are rendering some land available in the form of long-term, land leases to qualifying agricultural development projects. Leases, referred to as Certificates of Title of Right of Occupancy" are granted by the Ministry of Lands, Housing and Human Settlements Development to foreigners (local citizens, as well), who meet the requirements, as a derivative title having a maximum lease term of 98 years.

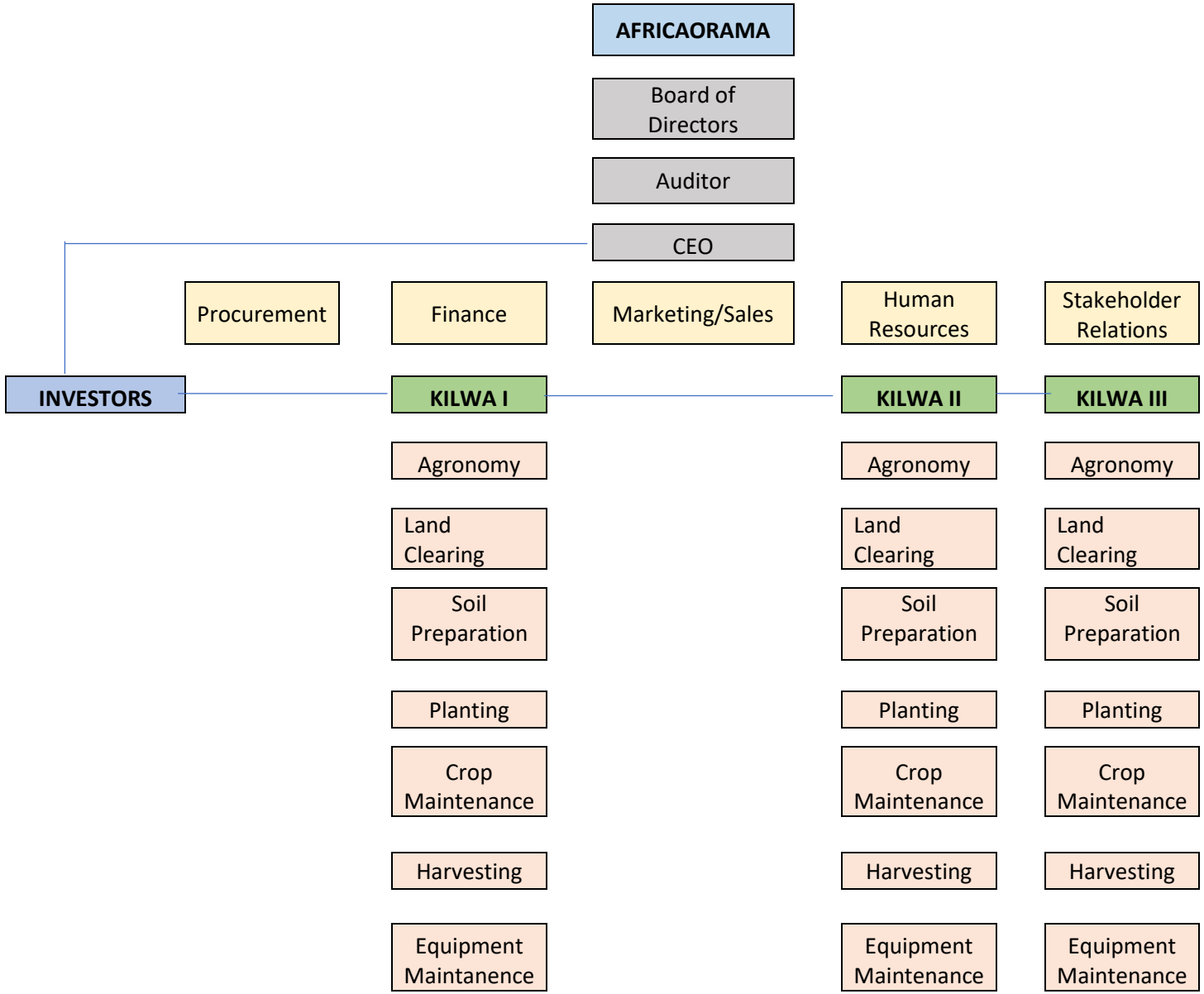
In late 2019, AfricaOrama began the application process to receive land for a large-scale, mechanized agriculture project in the Kilwa region. After reviewing three separate land parcels, AfricaOrama selected a parcel of 13,644 hectares controlled by the Migeregere and Kikole Villages. In the past month, the Councils of both Villages approved AfricaOrama's proposal to pursue a large scale, agricultural development on 13,644 hectares (APPENDIX III & IV).

PROJECT ORGANIZATION

Organizationally, AfricaOrama is the holding company for all agriculture operations. Once issued, the land titles will remain with AfricaOrama.

Agriculture operations, including investor funds, assets and liabilities shall held at the operating company levels. Individual operating companies will be organized to pursue specific projects which shall be based on a specific number of hectares as well as composition of the investor base. Kilwa I is the operating company for the initial project of 13, 644 hectares of land. Once Kilwa I is fully planted and operational, AfricaOrama intends to legally open a second company, Kilwa II, to carry on operations on a second block of land with the same or new investors. Ultimately, AfricaOrama hopes to develop enough projects to reach its 50,000 hectares objective.

The following page shows the organizational chart for AfricaOrama and its operating companies (Kilwa I, II and III).


AFRICAORAMA
Board of Directors
Auditor
CEO
Procurement
Finance
Marketing/Sales
Human Resources
Stakeholder Relations
INVESTORS
KILWA I
KILWA II
KILWA III
Agronomy
Land Clearing
Soil Preparation
Planting
Crop Maintenance
Harvesting
Equipment Maintanence
Agronomy
Land Clearing
Soil Preparation
Planting
Crop Maintenance
Harvesting
Equipment Maintenance
Agronomy
Land Clearing
Soil Preparation
Planting
Crop Maintenance
Harvesting
Equipment Maintenance

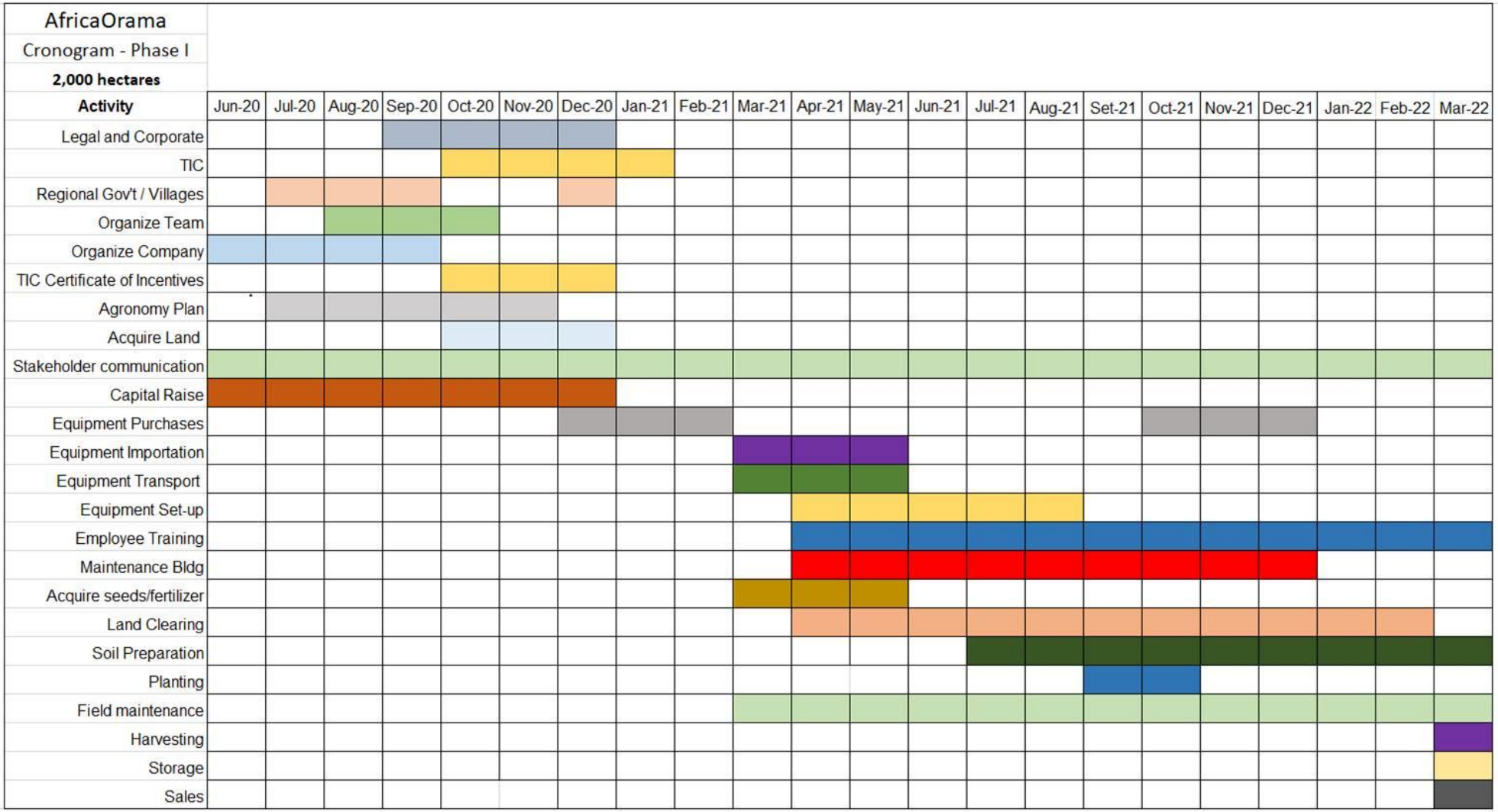
PROJECT ROLL-OUT

AfricaOrama's team possesses many years of practical experience in land clearing, soil preparation planting and harvesting. The project will benefit from two, annual crop rotations – October – February and March - June. Phase I of the project will convert and plant 2,000 hectares on or before September 2021 with a nitrogen fixing crop and a second rotation of 5,000 hectares in February 2022. Crop rotations will include sesame, sorghum, soybean, corn, maize, sunflower, and beans. Following a time sheet overview with the ideal periods and goals to be achieved from AfricaOrama team

AfricaOrama

Cronogram - Phase I

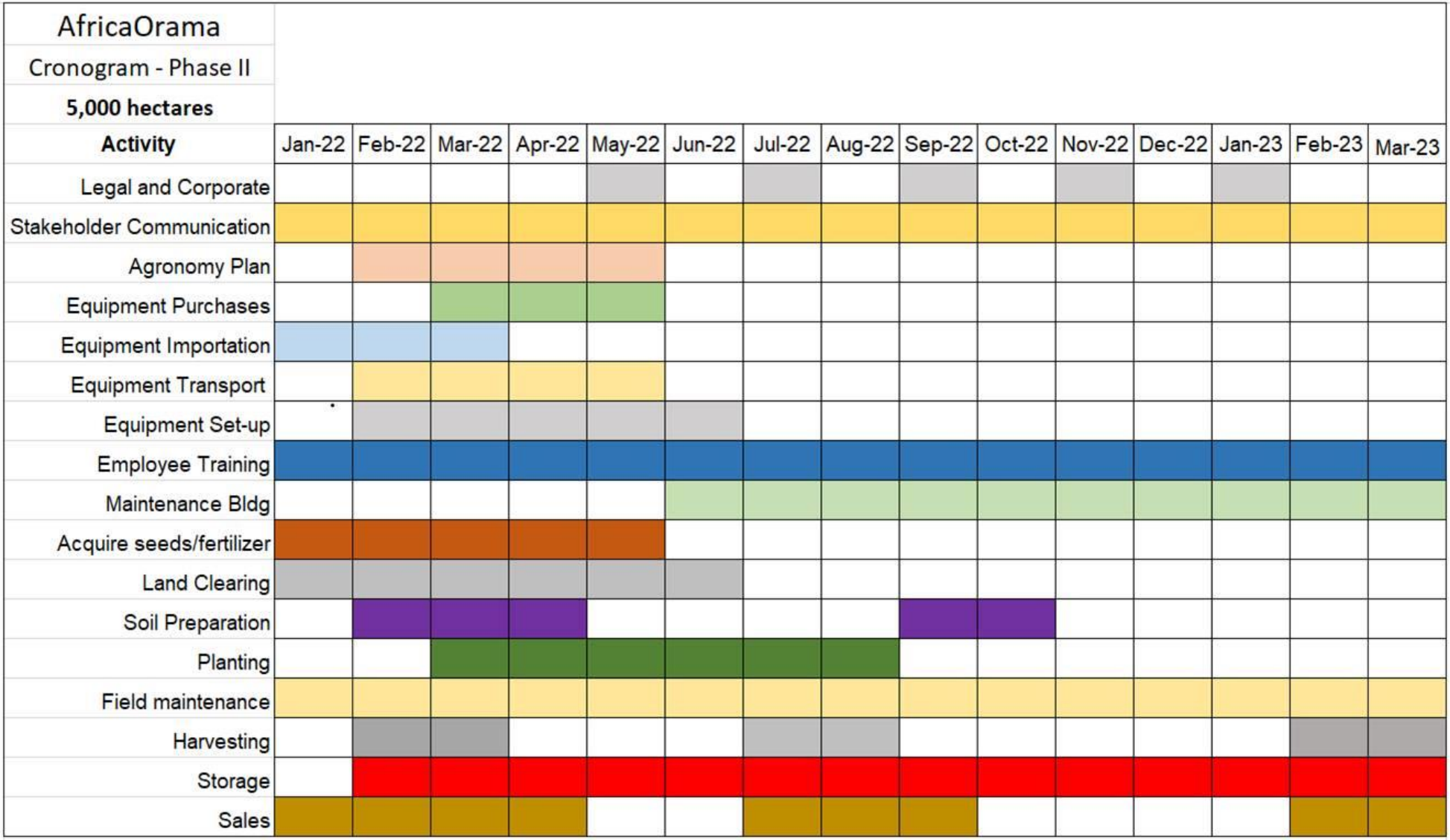
2,000 hectares



AfricaOrama

Cronogram - Phase II

5,000 hectares



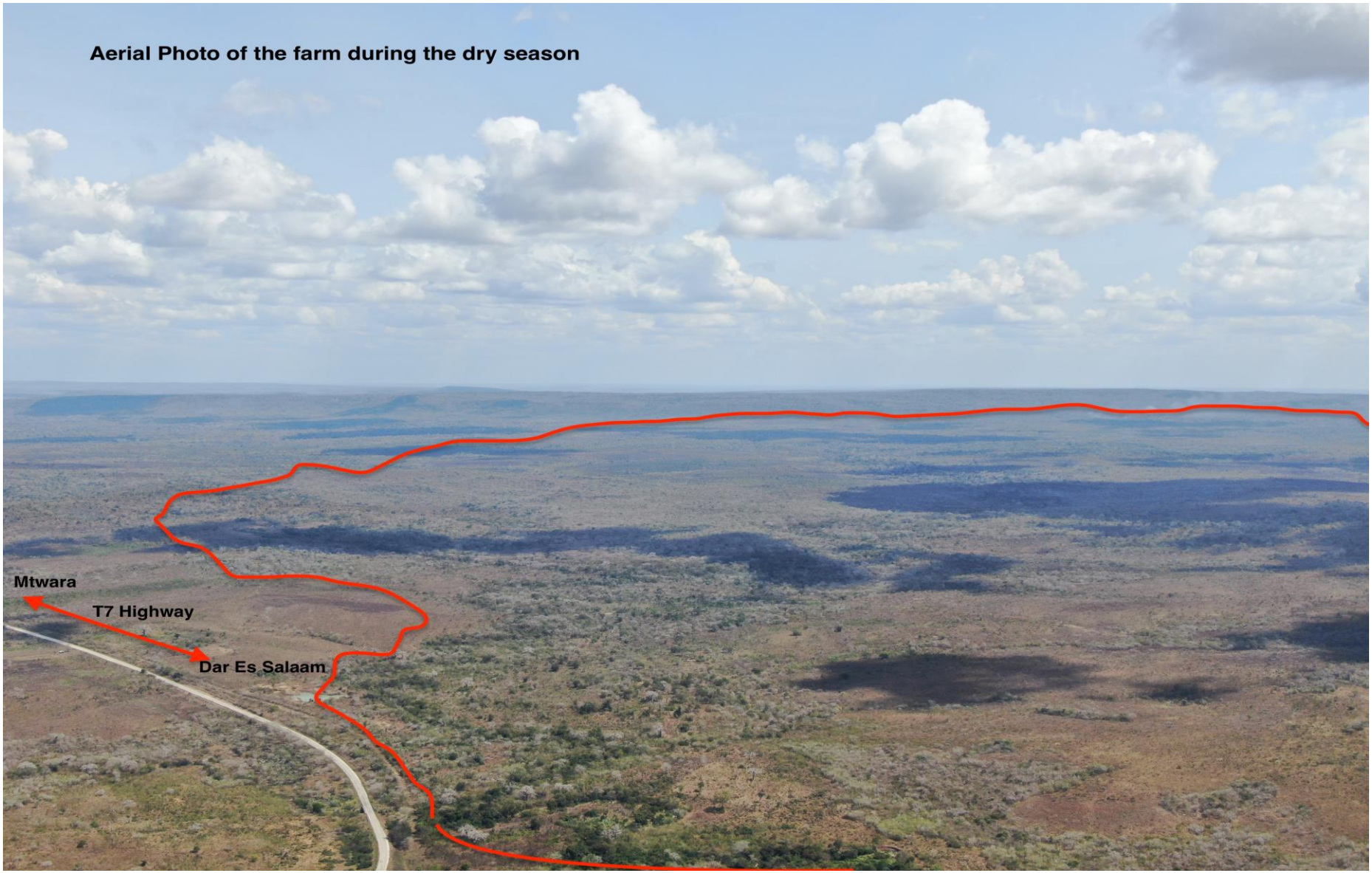
PRODUCT SALES

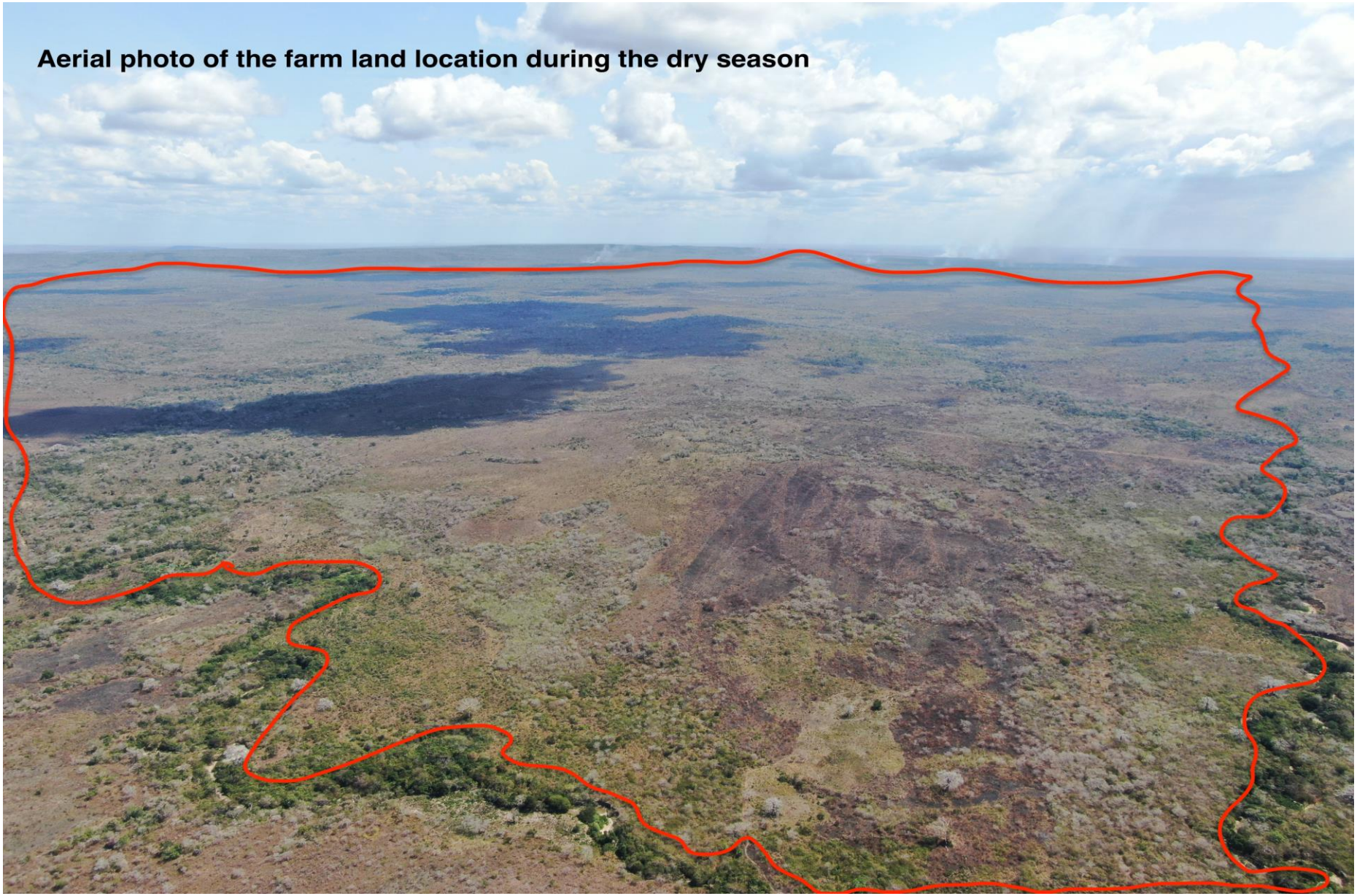
Marketing and sales will be an ongoing process and AfricaOrama expects to develop a diversified customer base to include domestic and foreign buyers. As timing and production quantities become better defined, AfricaOrama expects to hold serious conversations about offtake agreements with potential buyers. As of now, shareholders and directors have held direct conversations with the following groups who have expressed interest in buying from AfricaOrama:

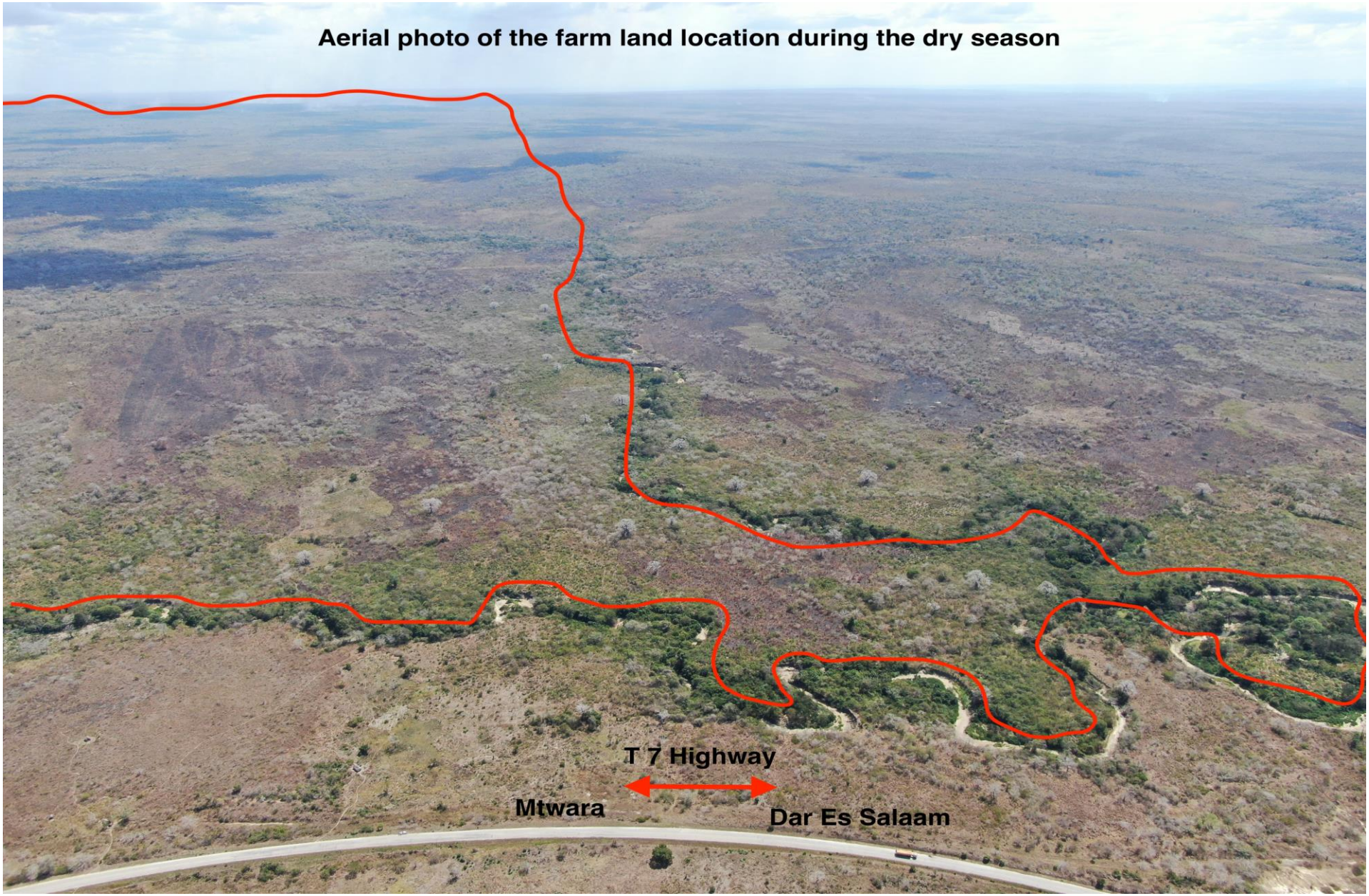
- **World Food Programme Tanzania**, Dar Es Salaam - cereals, sorghum, soyabean, maize, sesame
- **Azam Bakhresa**, Dar Es Salaam - maize, sunflower, soybean, sesame and wheat if we can produce it. Khalid has good connections
- **Tanzania Breweries LTD**, Buguruni - sorghum
- **Feed the Future TZ**, Dar Es Salaam - maize, soybean, sorghum and wheat
- **Farmlive Africa LTD**, Mtwara - sorghum and sesame
- **OBRI Tanzania Ltd**, Dar es Salaam - sunflower
- **Tridge, Seoul**, South Korea, managers of a global grain ecosystem – cereals for large customers such as Carrefour, Kellogs, Nestle
- **Menengai Ltd**, Nakuru, Kenya - sunflower (Kenya), wheat (Egypt) and soybean (South Africa)

PROJECT SITE

The project site is characterized as native land covered primarily by small bushes, Elephant grass and Acacia, Baobab, and Mahogany trees. Most trees are relatively small having diameters of 25 – 30 cm. An environmental impact assessment will be prepared in accordance with the requirements for agriculture projects in Tanzania. The land is home to a variety of animal and bird species. As this project is a small part of a very large undeveloped land area, it is expected that these animals will migrate to other areas. The land is primarily flat and there is a water reservoir located at the southwest corner of the project site. AfricaOrama plans to preserve this reservoir for wildlife habitat and protect it with a buffer zone of natural vegetation.


Aerial Photo of the farm during the dry season
Mtwara
T7 Highway
Dar Es Salaam


Aerial photo of the farm land location during the dry season


Aerial photo of the farm land location during the dry season
T 7 Highway
Mtwara
Dar Es Salaam

FINANCIAL RESOURCES

Pending receipt of the land in Tanzania and final documentation, U.S. based institutional and private investors based have agreed to invest USD 9,700,000.00 to develop Phases I and II of the project. The lead investor, a top 20 college endowment, will invest 50% of the capital to be raised. The balance will be invested by up to six wealthy individuals and one family office.

Officers will receive a modest base salary to manage the project, and for basic living and travel expenses. They may also receive incentive payments based on: (i) a timely and successful project roll-out; (ii) productivity of the agriculture crops measured in tons per planted hectare; and (iii) accomplishing certain Environmental Social and Governance objectives to be agreed upon jointly by the Board of Directors and stakeholders.

The financial budget of USD 9,700,000.00 is projected to cover fixed and operating costs for planting a first rotation of 2,000 hectares (Phase I) and a second rotation of 5,000 hectares (Phase II). Below is a summary of the sources and uses of cash resources for Phases I and II. Capital to complete the 13,644 hectares (12,000 planted) project will be derived from internally generated funds and shareholder investment. A 5-year financial model appears as APPENDIX V.

Sources:		
Equity investors	9,700,000	100.00%
Uses:		
Fixed costs (tractors, implements, other equipment)	4,617,321	47.60%
Operating costs (fuel, parts, maintenance)	1,107,763	11.42%
Soil amendments / fertilizers	1,241,907	12.80%
Seeds	125,000	1.29%
Chemicals	800,100	8.25%
Labor	500,237	5.16%
Office/residential	12,100	0.12%
Maintenance facilities	436,350	4.50%
Support equipment	127,772	1.32%
Insurance	210,000	2.16%
Working capital	521,450	5,38%
Projected 18-month fixed + operating costs less working capital	USD 9,178,550	100.00%
Projected 18-month pre-tax revenue *	USD 6,725,099	
Cash on cash return	USD (2,453,451	

**Based on current market prices less 30% for losses.*

HUMAN RESOURCES

Over the short, medium, and long term, the Company expects to hire most of its employees from within the surrounding region. Candidates for work may include residents from local villages as well as recent graduates in engineering and agriculture from universities and trade schools. In Years 1 and 2, the Company expects to hire up to 25 local employees for training on equipment use, maintenance and operation, as well as best agricultural practices. Others will participate in the construction and maintenance of necessary infrastructure such as water, energy, roads, fencing and construction. Over the medium to long term, the Company expects to hire and train approximately 25 Tanzanian citizens/residents for every 10,000 hectares under agricultural development. Should the Company successfully develop its planned 50,000-hectare agriculture project, it expects to hire approximately 125 local employees.

To help kick-start the project, AfricaOrama expects to hire 6 (six) foreign workers with experience in operating and maintaining farm equipment. The Company also expects that the manufacturer of this equipment will be available periodically to provide training to local employees.

AfricaOrama does not expect that every candidate for employment will demonstrate the necessary aptitude and skillset required for the job. Employees will be selected during company-sponsored interviews and training programs. Those employees exhibiting the qualities we seek, will be offered employment opportunities and the potential for career advancement within AfricaOrama. Successful employees will develop transferable skills to enhance their career and shall earn a salary that is above prevailing wages in Tanzania's agriculture sector. At all times, the Company shall maintain a designated HR person to oversee training and respond to employee concerns. The Company shall adhere to conditions set forth in the Labour Relations Act, 2004 and The Employment and Labour Relations (General) Regulations, 2017.

PROJECT DEVELOPMENT

AfricaOrama intends to purchase new agricultural equipment, including tractors and implements. Although initial financial costs are higher, the Company wants to avoid downtime typically found at agriculture projects using older equipment. Through experience, AfricaOrama has learned that lower productivity is frequently due to unscheduled mechanical breakdowns, irregular or poor maintenance routines, and a lack of available spare parts for repairs. New equipment, on the other hand, combined with regular maintenance and a full inventory of spare parts will avoid many of these problems with the result being more hours worked and better productivity. Due to favorable exchange rates and the quality of the new equipment available, AfricaOrama expects to purchase a majority of the new equipment in Brazil. The Company also expects to purchase some slightly used equipment in Europe or Canada.

The Company intends to purchase its tractors and implements from one or two large manufacturers. Each tractor will include state-of-the-art technology with automation control and capable of monitoring location, productivity, fuel consumption, operational precision, and maintenance alerts. As part of its equipment purchase contract, the manufacturer will provide on and off-site training to AfricaOrama's employees in maintenance, repairs and operation.

Initially the company may rent a large empty building near the port in Kilwa located 28 km east of the project site for equipment maintenance and storage. During Year 2, the Company plans to construct at least one large building at the project site primarily for storage, maintenance and repairs. The building will be located near the main highway and have access to energy. At all times, AfricaOrama expects to maintain at least one year of spare parts inventory, as well as the tools and equipment necessary to perform maintenance and repairs. The Company also plans to construct residential units at the site for some workers and security personnel.

AGRICULTURE PROCESS

The following is a step by step process of the development planned for AfricaOrama's agriculture project:

Step 1 - Clearing the land of native vegetation, constructing internal roads, natural fence and drainage systems.

Step 2 - Integrating native vegetation into the soil to increase organic matter and prepare the soil for amendments.

Step 3 - Amending the soil with nitrogen, phosphorous, potassium and calcium to correct deficiencies discovered during soil analysis by the company's agronomist: Apply NPK 15 – 15 – 15 granular and disc into the ground. Apply 100kg when seeding cover crops and the next 100kg prior to seeding the cash crop. NPK is absorbed slowly.
Light disc while seeding. Seed cover crop to prevent unwanted vegetation growth. Cover crop takes 45 days to grow. The day before seeding, light disc to incorporate the cover crop into the soil.
Two seeders for use when there is no cover crop: one with ripper and one with discs. The small ripper opens line into ground and the disc that opens the ground for seeding.
Seed with fertilizer: NPK with different scaling: 6-6-12, depending on the soil composition.
Germination - when minimum of 15 cm in height, perform mechanical weed control, dropping 15 kg of granular nitrogen (urea). Plants elevate, when 55 – 65 cm, another mechanical weed control pass to avoid chemical weed control. Prior to flowering, apply one pass of liquid nitrogen or spray if there is contamination such as mildew or fungus due to humidity.

Step 4 – Controlling weeds using laborers as well as herbicides applied by sprayers or crop dusters.

Step 5 - Planting following the initial rains. The Company intends to rotate crops between soy, sesame, sorghum, sunflower, corn and beans to maintain healthy nitrogen levels and reduce the chances for recurring mildews and pest infestation. Demand for certain crops as well as commodity pricing forecasts will also be factored into the planting decision. The Company will use non-GMO seeds, which, depending on availability, will be sourced within Tanzania or abroad.

Step 6 – Controlling weeds and pests using chemicals as well as constructing natural barriers such as eucalyptus trees and internal roads which provide a structural break. The Company will maintain an inventory of chemical products to combat weeds and pests, such as armyworms and insects, as well to deter swarming Locusts.

Step 7 - Fertilization using products purchased within Tanzania or, if unavailable, from abroad.

Step 8 - Harvesting crops.

Step 9 – Selling its agricultural output. The Company intends to sell the most of its agricultural products immediately following the harvest. However, depending upon market prices and price forecasts, it may conduct forward sales on a small percentage of its projected harvest. Initially, sales will be directed to domestic buyers, brokers and buyers in neighboring countries. As AfricaOrama increases its land area under cultivation, it expects to expand its marketing efforts to include foreign buyers.

SUPPLY INPUTS

The Company has held preliminary conversations with the following purveyors of supply inputs as to availability, source, quality, and preliminary pricing. As the need to make actual purchases becomes more relevant, the Company shall delve more deeply into the subject. For now, the Company is comfortable that supplies of fertilizers, herbicides, pesticides, chemicals, and seeds are available in Tanzania at prices within the financial projections for this project.

Fertilizers
Tanzania Fertilizer Company, Dar Es Salaam
Yara Fertilizer – Dar Es Salaam

Seeds
ASA, Morogoro
Seed & Co., Dar Es Salaam
East-West Seeds Tanzania, Dar Es Salaam

Chemicals (including herbicides and pesticides)
Tria Chem Tanzania, Dar Es Salaam
Monsanto Bayer Crop Science, Mbeya

Tractors and Equipment
John Deere, Campinas, SP - Brasil
Mantrac Tanzania Caterpillar, Dar Es Salaam
Sumo, UK
Horsh, Germany

Automobiles and Light Trucks
Toyota Tanzania, Dar Es Salaam
FAW Tanzania Ltd., Dar Es Salaam

Diesel, Oil and Hydraulic Fluids
Total Tanzania, Dar Es Salaam
Shell Tanzania, Dar Es Salaam

AGRONOMY

The Company's agronomy program is led by Daniel Msumbuko Nhunda, instructor and head of the soil analysis department at the Sokoine University of Agriculture. After spending considerable time at the project site to investigate the terrain and soil properties, Mr. Nhunda prepared a crop specific report (SEE APPENDIX VII) for sesame and sorghum (reports for corn, soybean and sunflower are under development) based on soil conditions at the site as well as recommendations to manage risks posed by mildews and pests. His report also includes rainfall, temperature, humidity and windspeed data for the past ten years. Although rainfall levels show variability from year to year, Mr. Nhunda believes that rainfall in the region is adequate to fulfill project goals and the water table at the project site is relatively shallow, which as he observes in his report, explains the year-round greenery of grasses and shrubs.

Below is a summary of the soil conditions observed by Mr. Nhunda at the project site which are favorable for agricultural development.

MIGEREGERE VILLAGE LAND

Topograghy *- The land is nearly homogenous and fertile. Water is not a big problem because trees covering the land are green throughout the dry season. This shows that trees are able to extract water from soils with little difficulty. The water table was observed to be near the surface of the soils as evidenced by the health of shallow rooted bushes and grasses in the middle of dry season. The land also contains hills and rivers which are good water collectors and watershed features. Presences of hills and rivers are potential sources of water for smooth running of the agricultural industry in this land.*

Soil characteristics *- Generally, soils at the Migeregere Village farm are clay in nature. These are some of the properties of clayey textured soils.*

Particle size - *Clay has the smallest particle size of any soil type, with individual particles being so small that they can only be viewed by an electron microscope. This allows a large quantity of clay particles to exist in a relatively small space, without the gaps that would normally be present between larger soil particles. This feature plays a large part in clay's smooth texture, because the individual particles are too small to create a rough surface.*

Soil Structure - *Because of the small particle size of clay soils, the structure of clay-heavy soil tend to be very dense. The particles typically bond together, creating a mass of clay that can be hard for plant roots to penetrate. This density is responsible for clay-heavy soil being thicker and heavier than other soil types, and clay soil takes longer to warm up after periods of cold weather. This density also makes clay soils more resistant to erosion than sand or loam-based soils.*

Organic Content - *Clay contains very little organic material; you often need to add amendments if you wish to grow plants in clay-heavy soil. Without added organic material, clay-heavy soil typically lacks the nutrients and micronutrients essential for plant growth and photosynthesis. Mineral-heavy clay soils may be alkaline in nature, resulting in the need for additional amendments to balance the soil's pH before planting anything that prefers a neutral pH. It will be necessary to test the clay-heavy soils before planting to gauge both the soil's pH and nutrient levels of nitrogen, phosphorus and potassium. These chemical parameters have already been analyzed and therefore well known.*

Permeability and Water-Holding Capacity *- One of the problems with clay soil is its slow permeability resulting in a very large water-holding capacity. Because the soil particles are small and close together, it takes water much longer to move through clay soil than it does with other soil types. Clay particles then absorb this water, expanding as they do so and further slowing the flow of water through the soil. This not only prevents water from penetrating deep into the soil but can also damage plant roots as the soil particles expand.*

Identifying Clay - *There are several tests you can use to identify clay soils. When in the field, I rubbed between fingers, a sample of clay soil and I often felt slicking and sticking to my fingers but also streaks were left on my skin. All these indicate that the soils were clayey.*

Other identifying properties of clay soils *- Rubbed clay soil often takes on a shiny appearance as well, as opposed to the rough texture you would see with other soils. Clay soils do not crumble well, and a sample of clay can typically be stretched slightly without breaking. When wet, clay soils become slick and sticky; the soil may also allow water to pool briefly before absorption due to the slow permeation. Visually, clay soils seem solid with no clear particles, and may have a distinct red or brown color when compared to the surrounding soil.*

Improve clay soil for proper crop production *- The first precaution is to "baby" clay textured soil and avoid soil compaction. Clay soil is particularly susceptible to compaction. Compaction will lead to poor drainage and clodding that gums up tillers and makes working clay soil difficult. In order to avoid compacting the soil, avoid work while it is wet. Until the clay soil is sufficiently corrected, avoid excessive tillage.*

Add Organic Material *- Adding organic material to clay soil will go a long way towards improving it. While there are a great many organic soil amendments, for improving clay soil, stick to compost or materials that compost quickly. Materials that compost quickly include well-rotted manure, leaf mold and green plants which can be obtained locally.*

Grow a Cover Crop *- A cover crop is anything that is planted in order to literally "cover" a piece of land that is not in use. Cover crops are used for a wide variety of reasons, from green manure to soil improvement to weed control. Cover crops are most often planted as green manure. Nitrogen fixing cover crops are much like sponges that soak up nitrogen as well as other nutrients that might otherwise be lost to weeds or washed away by rain and snow melt. Even non-nitrogen fixing plants will help to ensure that many of the nutrients in the soil can be returned to the soil when the plants are tilled under in the spring. Cover crops are a useful way to maintain and even improve soil conditions. While planted, cover crops prevent erosion by holding the top soil in place. They also help reduce soil compaction and help the beneficial organisms in the soil, like worms and bacteria, to flourish. When the cover crops are integrated into the soil, the organic material increases the soils retention capacity for water and nutrients. Lastly, cover crops compete with weeds and other undesirable plants that would like to take up up residence. Cover crops help to prevent this.*

KIKOLE VILLAGE LAND

The land here is more heterogeneous and hence more soil samples were required for proper characterization of soils. Generally, the land is very fertile and will support a variety of crops including maize, sesame, sunflower, soy, pady, legume family crops, cassava and fruit crops. It was observed that the soil texture ranges from clay to clay-loam.

Texture – *The soils found at the site are primarily loams and clay-loams. Loams consist of three textural components: clay, silt and sand. These elements combine with organic matter, water and air to form loam soils. Technically, a loam consists of clay (7 - 27%), silt (28 – 50%) and sand (</= 52%).*

Compaction Resistance - *Loams with higher levels of sand tend to resist compaction. Sandy loams provide a preferred surface for areas that tend to compact because of traffic or other conditions. As soils at the site are more clay like, steps should be taken to avoid excessive compaction.*

Drainage - *The amount of sand in loam gives it its drainage characteristics. Loam soils are free draining, especially when there is a low organic content. Clays and clay loam soils holds water better than sandy soil types because of the level of clay particles.*

Aeration - *In addition to draining well, loam soils feature good aeration levels. Loams having high amounts of clay offer slightly less aeration for plants, insects and soil organism. Proper levels of tillage, to enhance aeration, should be incorporated into any successful agricultural development at the site.*

Nutrients - *Loam soils are in the middle of the range in terms of their ability to maintain nutrient levels. Clay loams will hold nutrient levels better.*

RISKS AND RISK MITIGATION

Agricultural development is a high-risk business for the principal reason that many significant risks are outside of the farmer's control. Below are some common risks associated with agriculture and possible risk mitigation measures.

1. Crop Failure caused by below average rainfall, pest infestations, or poor crop management resulting in a complete loss of production and investment.

   Mitigation measures include irrigation, using seeds that require less water, crop insurance and maintaining resources to combat mildews and pests which threaten crops.

2. Low productivity caused by mechanical failures and poorly maintained equipment.

   Mitigation measures include regularly scheduled maintenance, adequate inventories of spare parts and competent mechanics to maintain and repair equipment.

3. Low crop prices due to excess supplies.

   Mitigation measures include constructing storage facilities to hold product off the market until prices firm.

4. Truck transport delays or strikes during the harvest which prevent delivery of production for sale.

   Mitigation measures include having strong contracts with transporters and/or purchasing trucks to control transport.

5. Fire and flooding.

   Mitigation measures include constructing fire breaks such as internal roads and planting natural barriers such as hedges or trees more resistant to fire. The site is located well above sea level and far enough inland to avoid significant damage from storm surge and typhoons.

TANZANIA INVESTMENT CENTRE

The Tanzania Investment Centre (TIC) was established in 1997 to be the Primary Agency of the Government to coordinate, encourage, promote and facilitate investment in Tanzaniaand to advise the Government on investment policy and related matters. As part of the Tanzania Investment Act of 1997, TIC grants Certificates of Incentives to qualifying entities to encourage and support the development of certain industries within the country. Agriculture is one industry which TIC bestows certain benefits including zero percent import duties on capital goods and replacement parts, 100% capital expenditure for agricultural sectors, 100% depreciation for plant and machinery used in agriculture and zero VAT on imports of agricultural implements, inputs (pesticides, fertilizers, and insecticides) exports, and use of loss carry forwards (SEE APPENDIX VI).

CURRICULUM VITAE

Davide Porzio
Chief Executive Officer
Age - 30

Skills and Experience

Forestry Sector

Equipment & Process

Ten years of experience in land conversion for large scale projects in the U.S., Australia, Brazil, Indonesia, Germany and Africa. Knowledgeable about equipment use, maintenance and practical application for specific projects. Comprehensive understanding of the use and maintenance of: Savannah disc plows, chopper-rollers, V-Shears, Stump pullers and rotary rakes; Pezzolato, Peterson, and Erjo wood-chippers; Caterpillar, Hyundai and Komatsu excavators and forwarders and, Caterpillar, Komatsu and John Deere prime movers.

Management

Two years of experience managing field operations for large scale projects and teams numbering from 15 to 200 employees and as many as 75 prime movers and other mechanized equipment at one time. Licenses include: Specialized Forestry Supervisor in Europe and Australia; Level F5 (Europe) Work and Safe use of equipment in tree harvesting operations; Chain Sawing (Europe and Australia); Worker Safety certification (Brazil).

Agricultural Sector

Founder and Owner, AgriALL, an agricultural services provider. Hands on experience farming 2,500 hectares in Italy: responsible for crop rotation, soil preparation, seeding, weed and pest control, harvesting, employee management, and equipment selection and operation. Fundamental and practical knowledge in the use, maintenance and repair of John Deere, Fendt and Case tractors and a variety of agricultural implements. During the winter season, AgriALL cleared snow and debris from the streets in municipalities and on runways and tarmac at Malpensa Airport (Milan).

Management

Overall responsibility for project bidding, purchasing, inventory, payroll and operations. Oversaw record and bookkeeping and financial management.

Maintenance

Hands-on, practical knowledge and experience maintaining and repairing prime movers and implements. Licensed welder – MIG, electrode and oxy acetylene. Experience in building and organizing a functional workspace equipped with small and medium sized hand tools necessary for keeping equipment operating. Also, skilled at modifying equipment to adjust to certain field conditions. As an example, in the forestry sector, designed and built a header for a silage chopper to simultaneously cut trees and transform into wood chips. In the agriculture sector, modified disc plow angles and structure maximize subsoil rotation and minimize disturbance to surface soils.

Work Experience

Farm Manager | Mpala Ranch Ltd | Masindi, Uganda | September 2020 - present
Direct and manage land conversion process for 4.700ha property in East Africa. Duties include managing day to day financial needs, organize team of 6-10 workers and supervise land clearing operations. Constant update with the investors through weekly reports.

CTO & International Product Manager | Savannah Global Solutions | Pembroke, GA – USA I February 2018 - present
Savannah has a reputation for building heavy duty forestry equipment capable of working in challenging environments throughout the world. I opened markets and sold, assembled and demonstrated equipment to large scale projects operated by the largest forestry companies in the world in Indonesia, Borneo, Malaysia, Brazil, Chile, Germany, France, Ukraine, Poland, Hungary, Latvia, Czech Republic and East and South Africa. Competent working with engineering sobware for equipment repairs.

Forest Production Manager | Croxley pti | Boyup Brook Western Australia | June 2016 -February 2018

Managed a team of 18 employees and operated forestry machinery such as skidders, feller bunchers, and wood- chippers. Managed daily routines of the fleet of service vehicles as well as welded and fabricated new equipment.

Production Manager | Stridem pti | Boyup Brook Western Australia |January 2017 - September 2017

As a forester, operated forestry equipment, including land conversion implements, and managed multiple teams of three foresters. Organized and started the land conversion department at Stridem with the acquisition of the first continuous, forward motion stump pulling device manufactured by Savannah Global Solutions.

Crop Manager | Anthony Witham Farm | Broomehill Western Australia| March 2016 - May 2016

Repaired and maintained seeders and fertilizer spreaders. Planned crop rotation.

Owner and founder | AgriAll di Porzio Davide and AgriALL SRL | Briona, Italy — 2010 - 2018

Founder of this agricultural service provider for projects throughout Europe. Projects included soil preparation, seeding, irrigation, fertilizing, spraying and harvesting. Responsible for the health and productivity for wheat, soybean and corn crops. During the winter season, cleared snow and ice from streets in municipalities and at Malpensa Airport and operated wood-chippers to produce wood chips for bioenergy.

Davide speaks Italian, English, Spanish and Portuguese

Peter Anthony Buttarello
Chief Operations Officer
Age 26
Education – European Level III, Agricultural Technician, Province of Varese (2013)

Agriculture and Forestry Experience

Cascina Poscalla Dairy Farm and Breeding, Lombardy, Italy – Welding (TIG, MIG), maintaining and repairing tractors and diary equipment. Designed and installed irrigation system and controls.

Agriall s.r.l, Piedmont, Italy – soil preparation, seeding and silage chopping. Managed field operations and performed repairs and maintenance on tractors and implements.

Giorgio Riva Contractors, SA, Ticino Canton, Mendrisio, Switzerland – maintained and repaired machinery for road and highway maintenance, earth moving and forestry equipment. Operated excavators and a variety of tractors.

Agroelite s.r.l Contractors, Veneto, Italy – Tractor operator for harrows, trenchers and plows. Equipment maintenance and repairs.

Anthony & Coreena Witham Farms, Broomehill West, Western Australia- planted and harvest wheat, canola and barley. Operated, maintained and repaired tractors, designed cropping management plan, operated sprayers for weed control and fertilization. Organized logistical support systems during harvest.

Priebbenow Silage Contracting, Greenmount, Queensland, Australia – One of Australia's largest silage contractors. Operated, maintained and repaired silage choppers, managed workshop, sandblasting, painting, welding, and overall equipment maintenance.

E.J. Cox and K.M Cox BLC Trust T/A Waterhatch Dairy Company, Busselton, Western Australia – 5,000 head of caele. Developed plans for soil tillage, planting, fertilization and harvesting using modern tractors and equipment. Crop rotation and sowing density, managed fertilization programs, developed techniques for silage chopping, oversaw milking cow milking machines, daily feed preparation, promoted dairy contracting services based on techniques utilized at Waterhatch Diary Company.

May Brothers Contracting, Ashburton, New Zealand – agricultural contractors for soil preparation, seeding and harvesting maize, canola and barely.

Zanini Vina_eri, S.A., Comi Lignornetto, Switzerland – The country's largest winery by area. Managed the winery's field operations. Oversaw pruning, chemical compound applications, harvesting and operated tractors.

Mpala Ranch Ltd, Masindi, Uganda – Farm, owned by an African investment fund, 4.700ha of virgin land to be converted to pasture. Managed the infield operations, daily machinery maintenance and service. Training of operators to use bulldozers, excavators and skidders and improving operating strategies to achieve the best productivity possible.

Peter is a skilled tractor operator and qualified mechanic for large agriculture and forestry tractors and equipment.

Peter operates remote control aircrab, shoots drone footage professionally and shoots and produces videos for a variety of European agriculture and forestry magazines.

Peter speaks Italian and English

Silvia Piredda
Humanitarian Project Manager
Age 26
Education: Languages degree (English, French, German), Galileo Galilei, 2013 - Master in Storytelling & Performing Arts, Scuola Holden, 2016 - Currently enrolled in BA (Hons) in Early Childhood
Occupation: Student, Humanitarian Project Manager and Co-Founder of AfricaOrama
Languages: Italian, English, French, German

Skills and Experience

Office management skills

Office managing

Working as an office manager gave me the opportunity to achieve some good managing skills as I had to schedule and co-ordinate meetings, appointments and events as well organise administrative work.
I see myself as a fast learner with the ability to adapt to new situations. I work well in a team as well as autonomously.

Computer skills

I've gained excellent computer skills with softwares such as word, excel, power point. I also have experience with e-mails and internet since I had to handle all incoming correspondence and prepare a wide range of communications, reports and documents.

Childcare skills - Early Childhood

Well versed in providing affection and safety to children. After High School, worked as an au pair and looked after two toddlers in the US. In Australia, worked as an Early Childhood Educator in a daycare center. These jobs helped increase experience with children. Adept at directing children in eating, resting and personal cleanliness as well as supervising and interacting with children positively. Learned about setting proper limits and boundaries with children and their families.

Work Experience

Early Childhood Educator / Early Learning Center YMCA / Western Australia / 2017-2018

Worked in different age group classes: babies (5 months-2 years old), toddlers (2-3 years old), pre- schoolers (3-5 years). Applied play-based strategies, including crafts and games, to provide diverse approaches to learning. Worked with teaching staff to evaluate individual progress and recommend appropriate learning plans. Maintained and fostered positive and constructive interactions with staff, families and children. Used classroom observations to create written assessments of children's performance.

Owner / The Smokey Stone / Boyup Brook, Western Australia /2017-2018

Opened a restaurant in the local pub of a very small community, with the intent to bring people together. Designed the menu with own recipes, managed the weekly grocery supply and handled all the public relations. During opening hours, I managed the clients by taking orders and supervising the kitchen staff. I also catered numerous events for up to 100 people.

Waitress / Emporium Bistrot / Western Australia / 2016-2017

Performed complete opening, closing and shift change duties to keep restaurant working efficiently and teams ready to meet customer needs. Greeted new customers, discussed specials, took drink orders and built immediate positive connections with guests. Prepared hot and cold beverages to highest standard while providing guests with optimal customer service. Displayed enthusiasm and promoted happy hour service to customers, successfully increasing referrals and walk-in business. Resolved guest and employee complaints to maintain complete customer satisfaction and workforce effectiveness.

Office Manager / AgriAll SRL / Italy / 2015-2016

Worked as an office manager for AgriAll srl, an agricultural company. Responsible of much administrative work and developed an effective organizational skill in addition to willingness to work above and beyond the call of duty. This experience has allowed me to develop a predisposition to interpersonal relationships and the ability to organize work autonomously.

Au Pair / Cultural Care Au Pair / United States of America / 2013-2014

Offered top-notch care to two children at once, ranging in age from 3 to 4. Kept notes of behavior issues, food served and medications administered to children. Prepared healthy foods and beverages for children based on optimal dietary guidelines and individual restrictions. Enforced rules and managed behavior through developmentally appropriate discipline. Taught children to organize toys, wash hands and cleaning up after themselves leading by example. Instructed children in crafts and other activities to promote gross and fine motor skills, including creating paintings, drawings, paper crafts and decorations.

David Jeffrey de Wind
Administration Manager

EDUCATION

University of California, Santa Barbara, Santa Barbara, California – 1977
Degree: Bachelor of Arts: Political Science
Degree: Bachelor of Science: Environmental Studies

BUSINESS EXPERIENCE

1977 – The Honorable Glenn M. Anderson, U.S. House of Representatives, Washington D.C. Staff intern. Assisted in formulation and coordination of policy decisions and dissemination of the Congressman's positions to other House member staff and constituents in the Port of Long Beach, California. Advised the Congressman during meetings in his capacity as Chairman of the Merchant Marine & Fisheries Committee.

1978 – 1980 EFS, Inc. Project Coordinator, for this environmental and economic consulting company. A special emphasis on industrial development projects including for: A bulk terminal carrier project transporting clinker from Asia to the Port of Long Beach, California; Standard Oil of Ohio's proposed pipeline from Long Beach, California to Midland, Texas; and, U.S. Borax, for reforming its waste water treatment facilities in Lancaster, California.

1981 – 1982 Dean Witter Reynolds, Inc., Los Angeles & San Francisco, California. Licensed as a registered representative with the National Association of Securities Dealers.

1982 – 1984 Oppenheimer & Co, Inc., New York City, NY. Vice President and Manager for institutional customers. Specialized in merger and acquisition risk arbitrage and distressed debt securities. Also, originated and coordinated a Safe Harbor Leasing Program between metropolitan transit authorities and corporate investors seeking tax advantaged, infrastructure investments.

1985 – 1993 Kayne, Anderson Investment Management. Partner and Portfolio Manager for firm clients and Opportunity Associates, an investment partnership focused on mispriced securities as well as arbitrage and distressed debt.

1993 – 1999 Strome Susskind Investment Management, Fund Manager. Focused on foreign and emerging market debt, equity and derivative securities. By early 1994, the firm had USD 1 billion of AUM.

2000 – 2001 Domodevedo International Airport, Moscow, Russia. Advisor to the Finance Director and sole owner of the airport and its wholly owned support facilities. Assisted to coordinate equity financing and participated in the structuring of a loan with the International Finance Corporation for two new runways. Also, in partnership with Deutsche Bank, London, UK, assisted in the origination and placement of structured loans for two Russian banks.

2001 – 2005 La Loma Roses, Somas, California. Co-owner, responsible for operations, sales and shipping. At the time, La Loma Roses was one of the largest growers of specialty garden roses in the U.S. and a significant supplier of specialty cut flowers, herbs and hydrangea. The Company was sold to an investor in 2005.

2006 – Present AEP Agricola and AEP, S.A., Bom Jesus, PI, Brazil. Founder, investor and board member. A land company, holding two parcels totaling about 96,000 hectares.

2013 - Present Alliance Quimica Industria e Comercio Ltda., Pacatuba, CE, Brazil. Investor in this small-scale chlorine plant developed by AVS Technology, Switzerland. Alliance was awarded a license to design, construct and operate a ten-ton chlorine production plant adjacent to CAGECE's water treatment facility near Fortaleza, CE. AllianceQuimica, owner and operator of the plant, operates under a renewable, multi-year chlorine and derivative products supply contract with CAGECE and local and regional businesses.

2015 – 2017 - Delta Energia Capital Partners, Partner. This newly organized asset management company raised R$1 billion from investors to buy and sell electric power from large, hydro-generation companies under medium and long-term contracts.

2018 – Savannah Brasil Serviços Agro-Florestais, Ltda. Founder & Partner. Relevant for large scale project, Savannah's equipment converts land from forest to agriculture use or reforestation, 8 – 10 x faster than traditional methods at an equivalent price.

RELEVANT COMPETENCIES

Investment Structure and Administration
Financial Accounting
Operations Management and Supply Chain
Investment Policy and Governance
Asset Allocation

CONTACTS

Please contact the following individuals for more information about AfricaOrama's project in the Kilwa region, Tanzania.

Davide Porzio davidep@africaorama.com celullar +1 (912) 704.1472
Silvia Piredda silviap@africaorama.com cellular +39 349 219.7988

APPENDICES

I. Brela Certificate of Incorporation

C.1

TANZANIA

BRELA
BUSINESS REGISTRATIONS AND LICENSING AGENCY

Certificate of Incorporation of a Company

Section 15

No: 142017687

I HEREBY CERTIFY THAT

AFRICAORAMA LIMITED

is this day incorporated under the Companies Act, 2002 and that the Company is Limited.

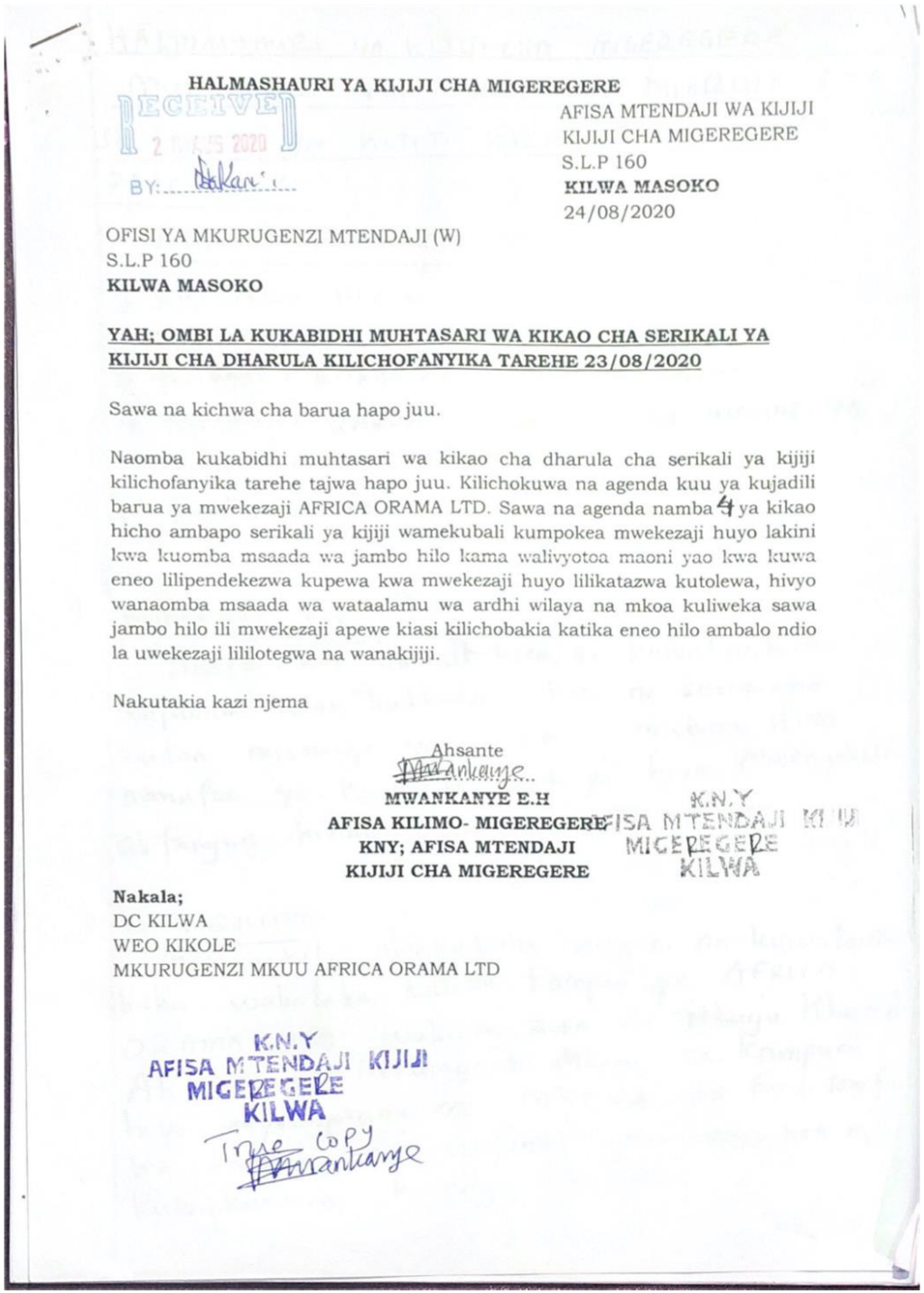
GIVEN under my hand at Dar es Salaam this **30th** day of **JUNE TWO THOUSAND AND TWENTY**.

REGISTRAR OF COMPANIES TANZANIA

PRINC ASST. REGISTRAR OF COMPANIES

II. Photos - Overview of existing project Site

III. Migeregere and Kikole Village Council Approvals



HALMASHAURI YA KIJIJI CHA MIGEREGERE

RECEIVED 2020
BY:

AFISA MTENDAJI WA KIJIJI
KIJIJI CHA MIGEREGERE
S.L.P 160
KILWA MASOKO
24/08/2020

OFISI YA MKURUGENZI MTENDAJI (W)
S.L.P 160
KILWA MASOKO

YAH; OMBI LA KUKABIDHI MUHTASARI WA KIKAO CHA SERIKALI YA KIJIJI CHA DHARULA KILICHOFANYIKA TAREHE 23/08/2020

Sawa na kichwa cha barua hapo juu.

Naomba kukabidhi muhtasari wa kikao cha dharula cha serikali ya kijiji kilichofanyika tarehe tajwa hapo juu. Kilichokuwa na agenda kuu ya kujadili barua ya mwekezaji AFRICA ORAMA LTD. Sawa na agenda namba 4 ya kikao hicho ambapo serikali ya kijiji wamekubali kumpokea mwekezaji huyo lakini kwa kuomba msaada wa jambo hilo kama walivyotoa maoni yao kwa kuwa eneo lilipendekezwa kupewa kwa mwekezaji huyo lilikatazwa kutolewa, hivyo wanaomba msaada wa wataalamu wa ardhi wilaya na mkoa kuliweka sawa jambo hilo ili mwekezaji apewe kiasi kilichobakia katika eneo hilo ambalo ndio la uwekezaji lililotegwa na wanakijiji.

Nakutakia kazi njema

Ahsante
Mwankanye..
MWANKANYE E.H
AFISA KILIMO- MIGEREGERE
KNY; AFISA MTENDAJI
KIJIJI CHA MIGEREGERE

K.N.Y
AFISA MTENDAJI KIJIJI
MIGEREGERE
KILWA

Nakala;
DC KILWA
WEO KIKOLE
MKURUGENZI MKUU AFRICA ORAMA LTD

K.N.Y
AFISA MTENDAJI KIJIJI
MIGEREGERE
KILWA

True copy
Mwankanye

HALMASHAURI YA KIJIJI CHA KIKOLE

RECEIVED
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BY: .....

Afisa Mtendaji Kijiji
Kijiji cha Kikole
SLP 160
KILWA MASOKO
27/08/2020

KUMB. NO KCH/IF/KK/F.01/101

MKURUGENZI MTENDAJI (W)
SLP 160
KILWA MASOKO

Y/ATH: KUFIKISHA MUHTASARI WA MKUTANO MKUU MAALUMU WA KIJIJI CHA KIKOLE KUMJADILI MWEKEZAJI MWEKEZAJI ~~AFRICA~~ ORAMA KWA KILIMO

Sawa na somo hilo hapo juu Kijiji cha Kikole wamefanya Mkutano tarehe 26/08/2020 kumjadili mwekezaji wakilimo cha Mchanganyiko Malindi ufuta Mahaage na Alfaabfa. Wanachi wa Kijiji cha Kikole Kupitia Mkutano Mkuu wa Kijiji wamekubali kumpatia ardhi ya Kilimo Mwekezaji Africa Orama. maombiya ekari Elfu kumi tu.
Naambatanisha na Muhtasali wa Mkutano wa tarehe 26/08/2020

Ahsante

O. Kamtamdi
V/O-Kikole

AFISA MTENDAJI WA KIJIJI
KIKOLE
HALMASHAURI YA WILAYA
KILWA

HALMASHAURI YA ICIJIJI CHA KIKOLE

RECEIVED
2 AUG 2020
BY: Hakari

AFISA MTENDAJI ICIJIJI
KIJIJI CHA ICIKOLE
SLP 160
27/08/2020

KUMB. NA KCU/TP/ICK/F.01/102

MKURUGENZI MTENDAJI (W)
SLP 160
KILWA MASOKO

YAH: KUFIKISHA MUHTASARI WA ~~MKKA~~O CHA HALMASHAURI YA ICIJIJI KUJADILI MAOMBI YA MWEKEZAJI AFRICA ORAMA KULIMA KIKOLE EKA ELFU KUMI (10,000).

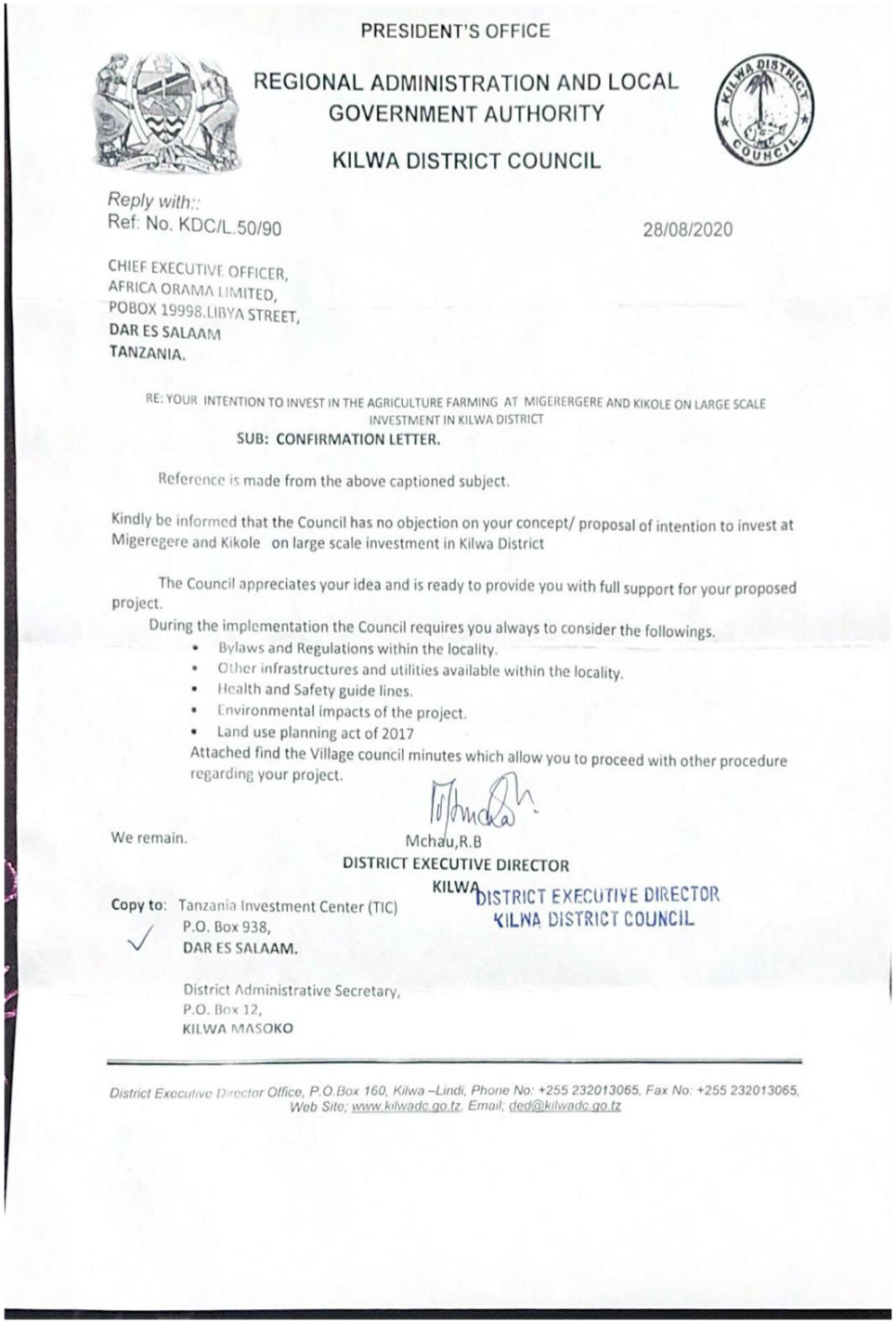
Sawa na somo hilo hapo juu Halmashauri ya kijiji imekaa kikao tarehe 24/08/2020 kujadili maombi wajumbe wamekubali kuyakuli na kijiji cha Icikole kwa Eka alizoziitaji. Halmashauli ya kijiji imeitaji kufuata taratibu zote za nchi. Maombi yamepelekwa kwa wananchi kujadili tarehe 26/08/2020.

Ahsante

O. Icamtanda
VEO-KIKOLE

AFISA MTENDAJI WA KIJIJI
KIKOLE
HALMASHAURI YA WILAYA
KILWA

IV. Kilwa District Confirmation Letter



PRESIDENT'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT AUTHORITY

KILWA DISTRICT COUNCIL

Reply with::
Ref: No. KDC/L.50/90

28/08/2020

CHIEF EXECUTIVE OFFICER,
AFRICA ORAMA LIMITED,
POBOX 19998.LIBYA STREET,
DAR ES SALAAM
TANZANIA.

RE: YOUR INTENTION TO INVEST IN THE AGRICULTURE FARMING AT MIGERERGERE AND KIKOLE ON LARGE SCALE INVESTMENT IN KILWA DISTRICT

SUB: CONFIRMATION LETTER.

Reference is made from the above captioned subject.

Kindly be informed that the Council has no objection on your concept/ proposal of intention to invest at Migeregere and Kikole on large scale investment in Kilwa District

The Council appreciates your idea and is ready to provide you with full support for your proposed project.

During the implementation the Council requires you always to consider the followings.

- Bylaws and Regulations within the locality.
- Other infrastructures and utilities available within the locality.
- Health and Safety guide lines.
- Environmental impacts of the project.
- Land use planning act of 2017

Attached find the Village council minutes which allow you to proceed with other procedure regarding your project.

We remain.

Mchau,R.B
DISTRICT EXECUTIVE DIRECTOR
KILWA

DISTRICT EXECUTIVE DIRECTOR
KILWA DISTRICT COUNCIL

Copy to: Tanzania Investment Center (TIC)
P.O. Box 938,
DAR ES SALAAM.

District Administrative Secretary,
P.O. Box 12,
KILWA MASOKO

District Executive Director Office, P.O.Box 160, Kilwa –Lindi, Phone No: +255 232013065, Fax No: +255 232013065, Web Site; www.kilwadc.go.tz, Email; ded@kilwadc.go.tz

V. 5-Year Financial Model

AFRICAORAMA		
Summary		
	USD	TZS
Currency Converter	1	2,317.00

YEAR	2021/2022	2022	2022/23	2023	2023/24	2024	2024/25	2025	2025/26	2026
Operational										
Crop Rotation	1	2	3	4	5	6	7	8	9	10
# Hectares Planted	2,000	5,000	6,750	8,500	8,000	12,000	9,000	12,000	9,000	12,000
Estimated Productivity (%)	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Hectares Planted										
Sorghum	1,400		3,000		3,500		4,000		4,000	
Sunflower	600		3,750		4,500		5,000		5,000	
Corn		2,250		3,000		3,000		3,000		3,000
Soybean		1,500		3,750		6,000		6,000		6,000
Sesame		1,250		1,750		3,000		3,000		3,000
Production / Hectare (Kg/Há)										
Sorghum	2,700		2,700		3,000		3,500		3,700	
Sunflower	5,000		5,500		7,500		8,000		8,000	
Corn		5,000		5,000		7,000		7,500		7,500
Soybean		2,700		2,700		3,500		4,000		4,500
Sesame		1,100		1,100		1,200		1,300		1,400
Net Production	7,700	8,800	8,200	8,800	10,500	11,700	11,500	12,800	11,700	13,400

Revenue / Hectare (USD/Kg)											
Sorghum	0.47	1,776,600		3,807,000		4,935,000		6,580,000		6,956,000	
Sunflower	0.35	1,050,000		7,218,750		11,812,500		14,000,000		14,000,000	
Corn	0.27		3,037,500		4,050,000		5,670,000		6,075,000		6,075,000
Soybean	0.43		1,741,500		4,353,750		9,030,000		10,320,000		11,610,000
Sesame	1.08		1,485,000		2,079,000		3,888,000		4,212,000		4,536,000
Net Revenue		2,826,600	6,264,000	11,025,750	10,482,750	16,747,500	18,588,000	20,580,000	20,607,000	20,956,000	22,221,000
Net Revenue @ productivity (%)	0.70	1,978,620	4,384,800	7,718,025	7,337,925	11,723,250	13,011,600	14,406,000	14,424,900	14,669,200	15,554,700

COGS & SG&A (USD)											
Total COGS		-	-	-	-	-					
Land Rental		10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Facilities Construction		453,850		225,800		115,000		350,000		625,000	
Equipment		5,495,421		2,991,157		2,468,177		2,848,940		1,480,325	
Soil Preparation		967,331		1,462,609		1,485,900		1,485,900		1,485,900	
Fuel		86,605		90,000		95,000		100,000		105,000	
Fertilizers		1,433,373		1,564,388		1,690,430		1,980,400		2,004,590	
Seeds		355,351		559,538		572,040		628,900		649,300	
Pesticides/Fungicides		800,100		1,743,075		2,543,175		3,005,090		3,100,490	
Licenses & Fees		15,000		25,000		35,000		45,000		55,000	
Total SG&A											
Residences/Food		32,900		18,400		18,400		16,000		16,000	
Utilities		71,859		74,700		82,050		85,300		87,470	
Insurance		84,798	187,920	330,773	314,483	502,425	557,640	617,400	618,210	628,680	666,630
Labor		612,866		540,000		525,000		498,700		498,700	
Social		19,786.2	43,848.0	77,180.3	73,379.3	117,232.5	130,116.0	144,060.0	144,249.0	146,692.0	155,547.0
Total COGS & SGA		10,439,240.2	241,768.0	9,712,619.8	397,861.8	10,259,829.5	697,756.0	11,815,690.0	772,459.0	10,893,147.0	832,177.0

Depreciation											

Pre-Tax Income (USD)		(8,460,620)	4,143,032	(1,994,595)	6,940,063	1,463,421	12,313,844	2,590,310	13,652,441	3,776,053	14,722,523
Provision for Income Tax	20%	-	-	-	125,576	292,684	2,462,769	518,062	2,730,488	755,211	2,944,505
Cash on Cash Return		(8,460,620)	4,143,032	(1,994,595)	6,814,487	1,170,736	9,851,075	3,108,372	10,921,953	3,020,842	11,778,018
Cumulative Cash on Cash		(8,460,620)	(4,317,588)	(6,312,183)	502,304	1,673,041	11,524,116	14,632,488	25,554,441	28,575,283	40,353,301

VI. TIC Procedure for Obtaining Certificate of Incentives

(d) **THE INCENTIVES PACKAGE AVAILABLE TO HOLDERS OF TIC CERTIFICATES OF INCENTIVES ARE:**

(i) Access to various services related to permits, licenses and approvals in the ***TIC One Stop Facilitation Centre***. The following services are currently available;

- Immigration services
- Labour Services
- Tanzania Revenue Authority (TRA)
- Ministry of Lands and Human Settlements services
- Tanzania Bureau of Standards (TBS)
- Business Registration and Licensing Authority (BRELA)
- National Environment Management Council (NEMC)
- Occupational, Safety and Health Authority (OSHA)
- Tanzania Food and Drugs Authority (TFDA)
- Tanzania Electric Supply Company Limited (TANESCO)

(ii) The recognition of private property and protection against any non-commercial risks. Tanzania is an active member of the World Bank Foreign Investment Insurance wing, MIGA (Multilateral Investment Guarantees Agency). Likewise Tanzania is a member of The International Centre for Settlement of Investment Disputes (ICSID) also a body affiliated to the World Bank.

(iii) Zero percent (0%) Import Duty on Project Capital Goods, Computers and Computer Accessories, Raw Materials and Replacement Parts for Agriculture, Animal Husbandry and Fishing, Human and Livestock Pharmaceuticals and Medicaments, Motor Vehicle in Completely Knocked Down (CKD) form and inputs for Manufacturing Pharmaceutical Products.

(iv) Ten percent (10%) - Import Duty for Semi-processed/semi finished goods).

(v) Twenty five percent (25%) - Import Duty for final consumer goods.

(vi) VAT on taxable goods and services are eighteen percent (18%).

NOTE: Destination Inspection on commercial imports with FOB Value of **US$5,000** and above is mandatory.

VII. Agronomist Report

Introduction.

AfricaOrama is the project that is to be established soon in Kilwa Masoko. The main crops to be grown are Sesame and Sorghum. The soils of the land were tested and the climatic conditions of the area were gathered. To know the suitability of this land to these crops, Land suitability assessment has to conducted. The vision for this project is one of combining Tanzania's human and land resources with modern and environmentally sustainable agricultural practices to create opportunities and transform lives.

AfricaOrama's philosophy is that development can only thrive with the cooperation and participation of the local community. We value honesty, fairness and a strong work ethic. We bring passion, knowledge and organization to build a successful agriculture project. Using modern, growing techniques and teaching those techniques to the local communities, we expect to succeed. Working alongside local Tanzanians, we intend to convert under-utilized land into a livelihood for families and the country.

Wayforwad to setup and establishment of the project.

All the following questions and answers are the principles and guideline on how the project will be established, maintained and ran in the smooth way that is beneficial to both the community and the owner.

QN1. Base on the soil samples taken at the Project Site, what crops are best suited for our soil
and weather conditions? Also, please take into consideration: soil analysis, rainfall, temperature,

humidity, and the short and long growing seasons and the length of those growing seasons.

ANSWER. To answer this question, Land Suitability assessment for the crops has to be done. Calculation of Annual rainfall, Annual Mean temperature, Relative humidity and Annual Mean Wind speed. It is done as follows

1.1 Land suitability assessment for SESAME and Sorghum.

What is land suitability?

Land suitability is the fitness of a given type of land for a defined use. The land may be considered in its present condition or after improvements. The process of land suitability classification is the appraisal and grouping of specific areas of land in terms of their suitability for defined uses.

Land may be classed as Not Suitable for a given use for a number of reasons. It may be that the proposed use is technically impracticable, such as the irrigation of rocky steep land, or that it would cause severe environmental degradation, such as the cultivation of steep slopes.

Class S1 Highly Suitable:	Land having no significant limitations to sustained application of a given use, or only minor limitations that will not significantly reduce productivity or benefits and will not raise inputs above an acceptable level.
Class S2 Moderately Suitable:	Land having limitations which in aggregate are moderately severe for sustained application of a given use; the limitations will reduce productivity or benefits and increase required inputs to the extent that the overall advantage to be gained from the use, although still attractive, will be appreciably inferior to that expected on Class S1 land.
Order N Not Suitable:	Land which has qualities that appear to preclude sustained use of the kind under consideration.
Class S3 Marginally Suitable:	Land having limitations which in aggregate are severe for sustained application of a given use and will so reduce productivity or benefits, or increase required inputs, that this expenditure will be only marginally justified.

Land suitability assessment for Sesame.

Land suitability classification involves the comparison of the land qualities of a land mapping unit (LMU) with the requirements of a land utilization type/crop requirements (LUT). Land qualities and characteristics are properties of land mapping units, in this case Kilwa project area.

Here below are the crop requirements for SESAME which will be compared with land qualities from Kilwa.

The tusk here is to summarize the standard Sesame crop requirements which then will be compared with the given land qualities/characteristics from Kilwa Masoko. This is done here below and this is known as partial suitability assessment.

Summary of climatic conditions.

This is summarized from the DATA Extracted at TMA at Kilwa Masoko

Table 01.

Year.	Annual Rainfall(mm)	Max. Mean Annual Temp(C)	Min. Mean Annual Temp(C)	Relative Humidity (%)At 12.00 GMT	Relative Humidity (%) At 06.00 GMT	Annual Mean Wind Speed AT 12.00GMT	Annual Mean Wind Speed AT 06.00GMT
2010	1055.7	30.5	23.7	69.6	77.0	10.2	6.0
2011	1026.8	30.3	23.6	72.2	78.3	9.6	5.7
2012	1089.8	30.3	23.4	59.3	80.8	9.5	6.1
2013	706.2	30.4	23.9	70.9	66.9	9.7	6.3
2014	905.2	27.8	23.6	63.8	79.0	9.3	5.7
2015	958.1	30.5	23.7	68.9	72.4	9.6	6.4
2016	755.3	30.6	23.7	67.3	77.9	10.2	7.3
2017	1291.9	30.4	24.0	69.3	76.3	10.9	6.8
2018	923.4	23.1	21.3	70.8	78.0	14.4	10.3
2019	1454.5	31.0	23.5	62.2	80.3	11.7	7.7

Table 2. Showing Sesame Crop Requirements.

LAND CHARACTERISTICS	Crop requirements
Soil Depth (cm)	
Soil pH (in H_2O)	5.5 to 8.0
Annual Rainfall (mm)	500 to 700
Annual mean Temperature ^0C	About 30 C
Annual Mean Humidity	About 40%
Soil texture	sandy clay loams
EC (uS/cm)	1.0–2.5
Textural Class	clay loam
Cu (mg/kg)	0.8 – 3
Zn (mg/kg)	3 – 5
Mn (mg/kg)	3.5 – 6
Fe (mg/kg)	6 – 10
TN (%)	0.2 – 0.5
OC (%)	15- 25
Ext.P (mg/kg) OLSEN	15–50
Ext.P (mg/kg) Bray-1	40–100

CEC (CmolKg-1)	25.0- 40.0
Ca^{2+} (CmolKg-1)	4.1-6.0
Mg^{2+} (CmolKg-1)	2.1-4.0
Na^{+} (CmolKg-1)	0.15 – 0.4
K^{+} (CmolKg-1)	0.4–0.6

Source. Landon (1991) and FAO (1976)

Partial Land suitability easement.

Matching of the Land qualities/characteristics and the Sesame crop requirements for each Land parameter given.

Table no.3

LAND QUALITY UNIT	VALUE OF THE LAND QUALITY	SESAME CROP REQUIREMENTS	SUITABILITY RATING
Soil Depth (cm)			
Soil pH (in H_2O)	7.44	5.5 to 8.0	S1
Annual Rainfall (mm)	700 -1454.5	500 to 1450	S1
Annual mean Temperature ^0C	31.0	About 30 C	S1
Annual Mean Humidity(%)	78.0	About 60%	S2
Soil texture Class	Clay	sandy clay loams	S2
EC (uS/cm)	209.91	<640	S1
Cu (mg/kg)	0.74	0.8 – 3	S2
Zn (mg/kg)	0.34	3 – 5	n

Mn (mg/kg)	7.05	3.5 – 6	S1
Fe (mg/kg)	1.57	6 – 10	n
TN (%)	0.14	0.2 – 0.5	n
OC (%)	1.53	15- 25	n
Ext.P (mg/kg) OLSEN	2.99	15–50	n
CEC (CmolKg-1)	48.47	25.0- 40.0	S1
Ca^{2+} (CmolKg-1)	43.29	10–100	S1
Mg^{2+} (CmolKg-1)	2.54	2.1-4.0	S1
Na^{+} (CmolKg-1)	0.35	0.15 – 0.4	S2
K^{+} (CmolKg-1)	1.09	0.4–0.6	S1

KEY.

S1, S2, S3 and n are highly suitable, moderate suitable, marginally suitable and not suitable scales of ranking suitability, respectively.

Overall suitability rating for sesame

By using subjective combination, the overall Land Suitability is obtained by using experience by ranking the partial suitability ratings.

Table no 4

Mapping Unit	Kilwa Masoko	
LUT	Sesame production	
Method	Approach	Overall suitability
Subjective combination	s1, s1,s1,s2,s2,s1,s2,n, s1,n,n,n,n,s1,s1,s1,s2,s1	S2

Since all the partial suitability ratings are temporary not suitable and suitable, then the overall Land ranking is **Moderate Suitable** (S2). In order for this land to be suitable for Sesame production then modification of all the not suitable parameters (n) should be made, and here are the solutions.

From **table No.2**, the parameters which are not suitable are Zn, Fe, TN, OC and P

Crop available N.

Nitrogen deficiency can be prevented in the short term by using grass mowing as a mulch, or foliar feeding with N fertilizer, and in the longer term by building up levels of organic matter in the soil. Sowing green manure crops such as grazing rye to cover soil over the winter will help to prevent nitrogen leaching, while leguminous green manures such as Soybean will fix additional nitrogen from the atmosphere. The use of Nitrogenous fertilizers like CAN and Urea are also important to bring up the recommended amount for Sesame production.

Low Phosphorus (P) content.

Correction and prevention of phosphorus deficiency typically involves increasing the levels of available phosphorus into the soil. The best way to introduce more phosphorus into the soil is with bone meal, rock phosphate, manure, and phosphate-fertilizers. The introduction of these compounds into the soil however does not ensure the alleviation of phosphorus deficiency. There must be phosphorus in the soil, but the phosphorus must also be absorbed by the plant. The uptake of phosphorus is limited by the chemical form in which the phosphorus is available in the soil. A large percentage of phosphorus in soil is present in chemical compounds that plants are incapable of absorbing. Phosphorus must be present in soil in specific chemical arrangements to be usable as plant nutrients. Facilitation of usable phosphorus in soil can be optimized by maintaining soil within a specified pH range. Soil acidity, measured on the pH scale, partially dictates what chemical arrangements that phosphorus forms. Between pH 6 and 7, phosphorus makes the fewest bonds which render the nutrient unusable to plants. At this range of acidity the likeliness of phosphorus uptake is increased and the likeliness of phosphorus deficiency is decreased. The soils at Kilwa have Ph greater than7, therefore acidic fertilizers like CAN and Urea have to be preferred in the long run to bring down the soil ph.

Organic carbon (OC)

The solutions for this are,

- Maintain soil fertility with inorganic and organic fertilizers to maximize production.
- If available locally, import manure/compost or other organic amendments.
- Incorporation of plant residues in the during cultivation. Also this will be achieved during

farm preparation since most of the shrubs and tender parts of trees will be mixed with soils.

Low Zn, Al and Fe.

These ions will be added to the soil by inorganic fertilizers containing Zn and Fe such the Yaramila product.

3.SORGHUM.

Sorghum can grow in a wide range of ecological conditions and can still yield well even under unfavorable conditions of drought stress and high temperatures. It is generally grown between in warm and hot regions characteristic of the semi-arid environment.

Sorghum requires warm conditions but it can be grown under a wide range of conditions. It can tolerate high temperature throughout its life cycle better than any other crop. Sorghum requires about 26-30^{o}C temperature for good growth. The minimum temperature for the germination of sorghum seed is 10^{o}C. Grain sorghum does not germinate and grow well under cool soil conditions. Poor emergence and seedling growth may result if planted before soil temperatures reach 35^{o}C. Sorghum is best adapted to areas having an average annual rainfall between 450 to 700 mm (17 to 26 inches). Although sorghum can respond to good moisture supplies, it is nevertheless one of the toughest, drought tolerant crops available and this tends to maintain its popularity in the regions where the weather is very unpredictable.

Land qualities for Sorghum

Table no.5, Sorghum Crop Requirements.

LAND CHARACTERISTICS	Crop requirements
Soil Depth (cm)	
Soil pH (in H_2O)	5.5 to 6.8
Annual Rainfall (mm)	500 to 700
Annual mean Temperature ^0C	276- 30 C
Annual Mean Humidity	About 40%
EC (uS/cm)	1.0–2.5
Textural Class	clay loam, sandy clay loams
Cu (mg/kg)	0.8 – 3
Zn (mg/kg)	3 – 5

Mn (mg/kg) tel:40-100%2025.0-%2040.0	3.5 – 6
Fe (mg/kg)	6 – 10
TN (%)	0.2 – 0.5
OC (%)	15- 25
Ext.P (mg/kg) OLSEN	15–50
Ext.P (mg/kg) Bray-1	40–100
CEC (CmolKg-1)	25.0- 40.0
Ca^{2+} (CmolKg-1)	4.1-6.0
Mg^{2+} (CmolKg-1)	2.1-4.0
Na^{+} (CmolKg-1)	0.15 – 0.4
K^{+} (CmolKg-1)	0.4–0.6

Source. Landon (1991) and FAO (1976)

Partial Land suitability assessment for Sorghum.

Matching of the Land qualities/characteristics and the Sorghum crop requirements for each Land parameter given.

Table 06

LAND CHARACTERISTICS& UNITS	VALUE OF LAND QUALITY	Sorghum Crop requirements	SUITABILITY RATING
Soil Depth (cm)			
Soil pH (in H_2O)	7.44	5.5 to 6.8	S2
Annual Rainfall (mm)	700 -1454.5	500 to 700	S1
Annual mean Temperature ^0C	23 - 31.0	26- 30 C	S1
Annual Mean Humidity	63- 78.0	Above 90%	S2

EC (uS/cm)	209.91	<600	S1
Textural Class	Clay	clay loam, sandy clay loams	S3
Cu (mg/kg)	0.74	0.8 – 3	S3
Zn (mg/kg)	0.34	3 – 5	n
Mn (mg/kg)	7.05	3.5 – 6	S1
Fe (mg/kg)	1.57	6 – 10	n
TN (%)	0.14	0.2 – 0.5	n
OC (%)	1.53	15- 25	n
Ext.P (mg/kg) OLSEN	2.99	15–50	n
CEC (CmolKg-1)	48.47	25.0- 40.0	S2
Ca^{2+} (CmolKg-1)	43.29	10–100	S1
Mg^{2+} (CmolKg-1)	2.54	2.1-4.0	S1
Na^{+} (CmolKg-1)	0.35	0.15 – 0.4	S1
K^{+} (CmolKg-1)	1.09	0.4–0.6	S1

Since all the partial suitability ratings are temporary not suitable and suitable, then the overall Land ranking is Moderate Suitable (S2). In order for this land to be suitable for Sesame production then modification of all the not suitable parameters (n) should be made, and are the same as in Sesame above.

Additionally, with this climatic conditions and the nature of soil properties obtained from Kilwa, the following crops can be grown though their Land suitability assessment is not done here, Maize, Millet, Groundnuts, sunflower, Cowpeas, Soybeans, Pigeon peas, Barley, Wheat, Sesame, Sorghum and Beans. With soil texture modification and water conservation practices, crops like rice, cassava, Potatoes and fruit trees can also be grown on this land.

Qn 2. Based on the soil samples, which macro and micro nutrients in the soil are in “deficit”?

Table 07.

LAB NO.S/2375			
FIELD REFERENCE-	15-18cm very deep humidity		
Parameter analysed	units	Value	Comment
Soil pH (1:2.5)	(in H_2O)	6.97	suitable
Electrical conductivity (EC) (kipimo cha chumvichumvi)	S/cm	212.01	suitable
Cu	mg kg^{-1}	1.79	high
Zn	mg kg^{-1}	0.46	low
Mn	mg kg^{-1}	13.89	high but non toxic
.Fe	mg/kg	2.68	low
TN-Kjeld	(%)	0.16	low
Organic C-BlkW	(%)	1.54	very low
AVN	mg/gm	19.14	low

Ext.P (olsen)	mg kg^{-1}	1.90	very low
Cation exchange capacity (CEC)	cmol kg^{-1}	54	medium
Ca^{2+}	cmol kg^{-1}	46.45	high
Mg^{2+}	cmol kg^{-1}	5.73	high
Na^{+}	cmol kg^{-1}	0.66	low but not limiting
K^{+}	cmol kg^{-1}	0.93	high
P.S.D. -Clay	%	54.48	
'-Silt	%	10	
'-Sand	%	35.52	
Texture slass		clay	Clay texture and therefore water conservation techniques are not required

From the Table above which represents one of the Soil Sampling Unit in Kilwa, it can be observed that some of the plant nutrients are in deficit. This sampling Unit has almost the same behavior with the other two rest Sampling Units.

Macronutrients are essential elements used in large quantities by plants. When essential elements are used in smaller amounts, they are called micronutrients. Macronutrients include carbon, hydrogen, nitrogen, oxygen, phosphorous, potassium, calcium, sulfur, and magnesium.

Macronutrients in deficit include Nitrogn(N), sulpher (S), Carbon© and Phosphorus(P)

Micronutrient are essential elements required by plants in small quantities. They include Zn, Cu, B, Mn, Mg, Na, Al and Fe ect.

Micronutrients in deficit at Kilwa project area include Zn, Al and Fe

Qn3. In order to correct and optimize the soil conditions at the Project Site, what recommend dations would you make to in terms of soil preparation and soil amendments (fertilizers)?

Answer. To improve deficiencies of the Macro and Micronutrients in the Kilwa Project area, the following should be done.

Crop available N.

Nitrogen deficiency can be prevented in the short term by using grass mowing as a mulch, or foliar feeding with N fertilizer, and in the longer term by building up levels of organic matter in the soil. Sowing green manure crops such as grazing rye to cover soil over the winter will help to prevent nitrogen leaching, while leguminous green manures such as Soybean will fix additional nitrogen from the atmosphere. The use of Nitrogenous fertilizers like CAN and Urea are also important to bring up the recommended amount for Sesame production.

Low Phosphorus (P) content.

Correction and prevention of phosphorus deficiency typically involves increasing the levels of available phosphorus into the soil. The best way to introduce more phosphorus into the soil is with bone meal, rock phosphate, manure, and phosphate-fertilizers. The introduction of these compounds into the soil however does not ensure the alleviation of phosphorus deficiency. There must be phosphorus in the soil, but the

phosphorus must also be absorbed by the plant. The uptake of phosphorus is limited by the chemical form in which the phosphorus is available in the soil. A large percentage of phosphorus in soil is present in chemical compounds that plants are incapable of absorbing. Phosphorus must be present in soil in specific chemical arrangements to

Macronutrients are essential elements used in large quantities by plants. When essential

elements are used in smaller amounts, they are called micronutrients. Macronutrients include

carbon, hydrogen, nitrogen, oxygen, phosphorous, potassium, calcium, sulfur, and magnesium.

Micronutrients are essential elements required by plants in small quantities. They include Zn, Cu,

B, Mn, Mg, Na,

be usable as plant nutrients. Facilitation of usable phosphorus in soil can be optimized by maintaining soil within a specified pH range. Soil acidity, measured on the pH scale, partially dictates what chemical arrangements that phosphorus forms. Between pH 6 and 7, phosphorus makes the fewest bonds which render the nutrient unusable to plants. At this range of acidity the likeliness of phosphorus uptake is increased and the likeliness of phosphorus deficiency is decreased. The soils at Kilwa have Ph greater than7, this causes most of the P to be fixed by Ca-compounds, therefore acidic fertilizers like CAN and Urea have to be preferred in the long run to bring down the soil ph.

Organic carbon (OC)
The solutions for this are,

- Maintain soil fertility with inorganic and organic fertilizers to maximize production.
- If available locally, import manure/compost or other organic amendments.
- Incorporation of plant residues in the during cultivation. Also this will be achieved during

farm preparation since most of the shrubs and tender parts of trees will be mixed with soils.

Low Zn, Al and Fe.

These ions will be added to the soil by inorganic fertilizers containing Zn, Al and Fe such the Yaramila product. The Yara Company has a good inorganic fertilizer product that contains most of the Micronutrients in their best proportion. It can be applied during seeding or as Forial application since the liquid Fertilizer of the same composition is also availabe

Qn4. Prepare a five-year soil preparation and planting (crop rotation) program.

There are numerous factors that must be taken into consideration when planning a crop rotation. Planning an effective rotation requires weighing fixed and fluctuating production circumstances:

market, farm size, labor supply, climate, soil type, growing practices, etc. Moreover, a crop rotation must consider in what condition one crop will leave the soil for the succeeding crop and how one crop can be seeded with another crop. For example, a nitrogen-fixing crop, like a legume, should always precede a nitrogen depleting one; similarly, a low residue crop (i.e. a crop with low biomass) should be offset with a high biomass cover crop, like a mixture of grasses and legumes.

The following table shows a crop rotation plan for five years regarding the crop properties grown/to be grown in a Project area.

Table no 08

Field name	Soil operation	1st year 2020		2nd year		3rd year		4th year		5th year	
		1st season	2nd season	1st season	2nd season	1st season	2nd season	1st season	2nd season	1st season	2nd season
A	Land converted and organic materials incorporated.		Sesame &soybean	sorghum	Corn & soybean	sunflower	Sesame &soybean	sorghum	Corn & soybean	sunflower	Sesame &soybean

NB. 1st season begins on September of each year and 2nd season on January. This is according to the climatic conditions extracted by TMA for Kilwa Masoko.

In the first year, land will totally have converted and much of the organic materials will be incorporated in soils. This year is in which heavy machines will be used. If the slope of the land is less than 3% then ridging is not necessary.

For the second, third, fourth year onwards, re hallowing and ridging if necessary will be performed. Seeding and fertilization during this period are to be taken up seriously to maintain production because most of the organic matter incorporated previously will by this time be almost exhausted.

Qn5. What are the major risks in our geographical area and what risk mitigation measures do you recommend?

Answer. The risks may be grouped in various categories depending on Climatic conditions, edaphic factors and social factors.

Drought.

A period of dryness especially when prolonged specifically when rains are expected, and that causes extensive damage to crops or prevents their successful growth resistant to **drought**. Sometimes in Tanzania we do experience changes in rainfall pattern and have drought period long than expected. This when happens during growing season may affect crops.

Crop diseases.

Diseases for Sorghum

Table 09.a

Disease	Description	Treatment
Leaf Blight	This is common in southern Africa, and is favoured by moderate air temperatures and wet conditions or heavy dews. Dry weather retards the disease.	Rotation with non-susceptible crops (non-grasses) aids in destruction of infected residue thereby reducing the level of primary infection.
Downey mildew:	Infested seedling leaves are chlorotic, stunted and pre-mature death may result.	Use of Seed Co resistant varieties is the smartest control method
Smut	head becomes swollen and turn grey.	Ear Use of Seed Co resistant varieties is the smartest control method

Disease for Sesame.

Table 09.b

Disease	Chemical	Mode of application	Reference
Alternaria leaf spot	Carbindazim 50wp (0.1%); Mancozeb (0.25%) Carbindazim 50wp+mancozeb	3 sprays as and when disease appear at 15 days interval	Abraham et al., 1976; Swain et al., 1989 Anonymous, 1997;
Corynespora blight	Zineb (0.25%)	3 sprays as and when disease appear at 15 days interval	Anonymous 1993
Bacterial leaf spot	Agrimycin 100 (250 ppm) Cupervit 50 (0.5%) or Difolatan 80 (0.16%)	3 sprays as and when disease appear at 15 days interval	Verma and Daftari, 1976; Urdaneta and Mazzani, 1976

Powdery mildew	Sulfex (0.2%) Karathane (0.2%)	2 sprays starting from the imitation of disease at 10 days interval 2 spray at the beginning of flowering and fruiting	Sharan et al.,1985; Anonymous, 1992 Castellani and Jama, 1984
Phyllody and leaf curl	) Phorate 10 g (10 kg/ha) Dimethoate (0.03%) Profenofas/sponosad	Soil application 2-3 foliar sprays	Anonymous, 1992

Pests for SORGHUM

Table 10 a.

Insect	Description	Treatment
Aphids	These usually appear during head emergence and flowering	spray with Dimethoate (Rogor) or Mercaptothion (Malathion).
Heliothis bollworm	These caterpillars may attack the heads after flowering.	Control with Thiodan before 1st February or with synthetic pyrethroids from February onwards
Stalk borer	This is the same pest as in maize. . Extensive damage by stalk borers may result in the introduction of Fusarium stalk rot, stem lodging and considerable loss of grain yield.	use trichlorfon (Dipterex) or Endosulfan (Thiodan) granules applied in the funnels at 3 to 6 weeks after planting. Alternatively, spray into the funnels with Carbaryl
Shoot fly	Feeding larvae cause drying up of central leaf and dead heart symptoms on 1-4 week old seedlings.	Timely planting, thionex and carbaryl are the chemical control remedies

Spider mites	Suck sap from the leaves to cause stunting especially rife during hot dry spells.	Acaricides will be a good chemical control measure.
Birds	These become a problem as the crop approaches maturity	Bird scaring is the only effective way of minimizing bird damage, but community co-operation in planting dates may also help to spread the risk. Red/Brown sorghum is bird resistant.

Pests for Sesame.

Table 10 B.

Disease	Description	Treatment
Aphids, leafhoppers and thrips	are common pests of sesame. All three are sucking pests that tend to cause stunted growth and may injure buds, thus preventing development of seedpods	Use of insecticidal soap spray. However, you may need to spray several times if the infestation is severe. You can also spray infested plants with neem oil, which will smother pests of sesame.
Leaf roller, cutworms and other caterpillars	Check the sesame plants closely at least once every week	Remove damaged growth. Remove the pests by hand if possible and drop them into a bucket of soapy water.

Conflict from Pastoralists.

Though I have not physically visited the area but it is common for large agricultural investment like this to be confronted with groups cattle that destroy crops and even structures in the farm. To mitigate this, we have to use the Village leaders who will sensitize villagers and Pastoralists around the firm. Also few security people who will be patrolling the area throughout can be employed.

Fire outbreaks.

We ought to construct Firebreaks in the farm, these also serve as roads, such as a logging road, four-wheel drive trail, secondary road, or a highway. The purpose of a firebreak is to provide an area of reduced fuel load which will reduce the intensity of a fire and therefore allow for more effectively combating and to also serve as a line from which a back burn can be started

Qn6. Based on weather data, what kind of fungus, bacteria or molds will we confront and how would you propose to manage and mitigate these risks?

Answer. Fungi we expect to confront include Alternaria, Curvularia, Fusarium, Helminthosporium, Penicillium, Mommoniella and Rhizophus sp. These have been found associated with sesame& Sorghum and among these, Alternaria is the most destructive pathogen of sesame. Leaf spot caused by Alternaria sesami (Kawamura) Mohanty and Behera is one of the major seed borne fungal disease of sesame.

Management

These Fungi of sesame &Sorghum will be managed through novel seed dressing fungicides, botanicals and bio-agents. Again a proper seed selection is one of the control mechanism. Timely planting and field sanitation are other measures of controlling Fungi in the field.

Qn 7. We have read much about the Locust problem in East Africa. Are the locusts a problem in Tanzania and what measures are agronomists recommending to mitigate the risk of locust infestation and damage to crops?

Answer. Here in Tanzania, Locusts are not a problem, there have not once landed here at all. And if the outbreak lands on, then spraying using

Qn8. What crop types have you had actual field experience?

Answer.

The crops that I have had field experiences are Maize, Cotton, Cassava, Beans, Sweet Potatoes, Banana, Coffee, Vanilla, Sunflower, Sesame and Rice.

Qn9. Given that the Project site is native land and has never been planted, what crops would you suggest to plant and in what rotation/cycle? (Note: we are considering sesame, sorghum, soybean, corn, sunflower.

Answer. Crop rotation can be viewed in two different ways. **Rotation in space** and Crop rotation on time. Crop rotation in space means dividing the land into several portions and plant the portions with different crops in the same season. The crops are shifted to different portions in the next season. For example, if the crops were maize and beans, they will be planted interchangeably in the next season

Time wise crop rotation is a practice by which different crops are planted in the same portion of land in different seasons of the year. For example, if the crops to rotate are maize and beans, then in the portion this season we plant beans only and maize for next season in the same piece of land.

For the first rotation.

For our virgin land in Kilwa I suggest that we use crop rotation in time. This is because the two seasons in Kilwa differ much. One is longer than the other. One has more rainfall (the long) than the other. Therefore, some crops like Corn, Sesame and Soybean will well be supported in the long rains season for their best performance. The drought tolerant crops will be grown in the short rains season. We expect to start seeding in January/February, this is a long rains season and hence have to begin with Sesame in one portion and an intercropping of Con with Soybean in another portion.

For the second rotation.

We plant Sorghum where we had planted Sesame, and Sunflower where we had planted an intercrop of Corn and Soybean. These are to be planted in September and October (short season). These crops are drought tolerant thus why I propose them to be grown in this period since rains are scarce and short compared to the other season.(Refer table 08)

Qn 10. Are there varieties of spring/summer wheat or barley that could be grown at the project

site? Do you know of varieties that would be worth testing in a 1 – 5-hectare area?

Yes. There are varieties of wheat that are grown in Tanzania and they also can be grown in Kilwa Project area. Examples are Sifa, Juhudi, Chiriku, Mbayuwayu and Rumbesa. Wheat requires an area with low temperature for its better growth. In Kilwa would be grown in Months like June, July, August and September because these are Months with low Temperatures but the problem would be rainfall since these Months are dry.

Qn 11. In Years 1 – 5, what level of productivity do you "estimate" for each crop variety?

Response. The productivities of the crops will vary depending on fertility status and rainfall availability. Normally for virgin lands like that of ours, crops do better in the first season because the top soils are covered by a little organic matter utilized by crops in first rotation. Production then falls down in the next season continuously otherwise heavy additions of fertilizers and other amendments are maintained. We expect to have an increasingly rate of production seasonally by fertilizing the land as required and here is a production projection.

Table 11.

	Type of Crop					**Year**
	Sesame	Sorghum	Corn	Sunflower	Soybean	
Production estimation	1200kg/ha	2800kg/ha	5000kg/ha	5000kg/ha	2700kg/ha	2020/2021
	1100kg/ha	2700kg/ha	5000kg/ha	6000kg/ha	2700kg/ha	2021/22
	1200kg/ha	3000kg/ha	7000kg/ha	7500kg/ha	3500kg/ha	2022/23
	1300kg/ha	3500kg/ha	7500kg/ha	8000kg/ha	4000kg/ha	2023/24
	1400kg/ha	3700kg/ha	7500kg/ha	8000kg/ha	4700kg/ha	2024/25

Qn 12. What equipment and tools do you need to set up laboratory to analyze soil for a fertiliza tion plans and possibly, analyze the crops while growing to prevent plant disease, such as fungus,

and pests? Do you know the cost of the equipment? Are you able to conduct field tests and operate the laboratory alone or will you require an assistant? (Note: This laboratory will only be for land operated by AfricaOrama.)

Answer. A local soil laboratory is essential for health of the project. I advise that we start with

a small Mobile laboratory known as Soil Doc Kit System then later we can do more. It performs

almost all the necessary soil and crop parameters such as measurement of Macro and Micro nutrients. In totality of its components, it costs about 8000 USD. The following is a sample appearance of the Soil Doc Kit. (it is better to have another person to work with).

Definition.

Soil Doc is a portable, on–farm soil testing kit coupled with an android system that provides farmer tailored soil and crop management recommendations including inorganic and organic inputs and soil conservation practices. Recommendations are provided in near real time. The soil fertility parameters analyzed with the Soil Doc field kit include soil pH, biologically active soil organic matter, electrical conductivity (indicative of general fertility as well as salinity issues) and extractable macronutrients (nitrate-N, sulfate-S, phosphate-P, and potassium-K). The kit also has the capacity to test these nutrients in the sap of growing crops. Furthermore, the kit includes tools to measure soil physical properties such as surface sealing strength, compaction, and aggregate stability (a property that integrates biological, chemical and physical conditions).

Fig.01 External appearance of Soil Doc Kit System

Fig. 02 Internal appearance of the Soil Doc Kit System.

Fig.03. It is portable as seen in the Phot

Another important tool is Silver foil **psychrometer**.

This is the device which is used to measure water potential in crops by using plant leaves.

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