































ZOOM ETIQUETTE



Always join the meeting using your full name. For security purposes, unknown participants or those who join using numbers, initials or nicknames will henceforward be removed.



Mute your microphone every time you are not contributing.



For better bandwidth utilization, you may put off your video when not contributing.



Raise your hand when you want to speak



Ask questions or comment in the chatbox

Theme: Forest Landscape Restoration







































KENYA FORESTRY RESEARCH INSTITUTE

KEFRIApp

The Tree Species to Site Matching Tool for Ten Percent Tree Cover in Kenya

Jane Njuguna (PhD) and; The KEFRI Innovation Team



Introduction to KEFRI

➤ Kenya Forestry Research Institute (KEFRI) is a state corporation established in 1986 under the Science and Technology ACT, Chapter 250 of the Law of Kenya, which has since been repealed to Science, Technology and Innovation Act 28 of 2013

Vision, Mission and Mandate and Strategic Objectives

> www.kefri.org

Key Strategic Objectives in the 6th KEFRI Strategic Plan



To generate and transfer forestry technologies for:

- Production of superior germplasm for priority tree species for different agroecological zones through intensive breeding and management of pests and diseases to increase productivity.
- **2. Establishment and management of forest plantations**, trees on-farms and general landscapes
- 3. Rehabilitation and restoration of degraded forest landscapes, woodlands, wetlands and riparian eco-systems for adaptation to climate change and sustainable livelihoods
- **4. Efficient processing and utilization** of wood and non-wood forest products to promote **circular economy**
- 5. Enhance corporate communication, technology transfer and partnerships

KEFRI Innovations



Over 500 research products technologies and innovations instrumental to assisting the country achieve its national and global development agenda. These include;

- ➤ **High quality germplasm** to increase on-farm productivity and expansion of forestry programmes
- ➤ Integration and diversification of trees, bamboo, grasses, shrubs for soil erosion control and increased crop production
- Bioprospecting for biochemicals, medicinal and herbal products for improved citizen health and dyes for the textile industry, food flavors, food, fruits and fiber and biomass energy,
- Right species mix for optimum Carbon sequestration for mitigation of climate change.
- Innovative digital products such as KEFRIApp to track progress of ten percent (10%) tree cover by 2022 and;
- ➤ **Piloting aerial seeding** assisting the country meet its international commitments of restoring 5.1 million hectares of degraded lands by 2030.

The KEFRIApp



Professional Guide to Tree Growing in Your Hand

Why Develop the App?



➤ Projects come and go: Many tree planting activities have been undertaken in the country costing billions of shillings with no data of their achievements on trees planted on public and private land and also data on survival is lacking;

➤ Publications??

- ➤Investors (processors) are therefore not sure of where to establish investments especially near farmlands; (high transport costs leads to low cost for forest produce)
- ➤ No data on how many trees are felled every year and for what purposes to update contribution to GDP
- Many complaints of poor survival and mortality of trees due to wrong choices of tree species in various sites
- ➤ To achieve the National Strategy for achieving and maintaining 10% tree cover by 2022 identified the need for **innovative products to track progress** of the same

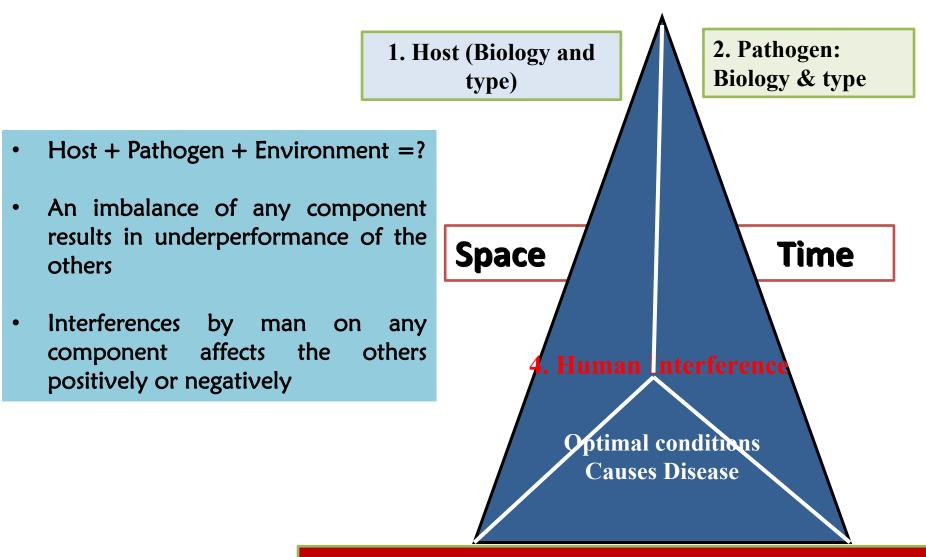
The KEFRIApp



- KEFRIApp is a mobile platform that seeks to guide tree growing using **species site matching** to enhance establishment and survival potential.
- Takes in to account the conditions optimal growth or conversely optimal conditions for disease /mortality to occur as explained in the "The Disease Triangle"

The Disease Triangle (Trapezium)

The case for species site matching



3. Environment: Temperature, Rain, Site, Wind, Soil factors

KEFRI APP- Objectives

- •To provide science based information to enhance success of the many greening activities by stakeholders in forest based enterprises and initiatives in forest management and landscape restoration to promote resilient tree growing across the country.
- Enable Government Institutions, private companies and individuals to document tree planting activities over time,
- >Monitor survival of planted trees to inform investors and;
- ➤ Provide professional guide on tree planting/management for various purposes by linking with:
 - > m-Forester and
 - >IPM modules
 - >Commercial tree species selection for different areas

KEFRI APP- Other Objectives



- Initially to track the progress towards the achievement of the 10% tree cover by 2022,
- When fully implemented it will provide big data on total number of trees in planted in the country, disaggregated by species, age, County /region etc
- >User friendly application for use by tree growers just like the MPESA

Together with the use of drone technology in forest monitoring, KEFRI envisions that it is possible to calculate the number of trees growing in Kenya at any given moment

And redefine "Tree Cover and Forest Cover"

Current Features of the KEFRIAPP



- 1. Phone module and Web-based module
- 2. A dashboard with menu of functions/tools:
- 3. Species to site matching (up-to sub-location level)
- 4. Documenting new planting activities and national tally of planted trees in <u>real time</u> and also cut trees
- 5. Documenting a previous planting activity and also cut trees over time
- 6. Map view of all documented tree planting activities (*Photos not downloadable, must be a real activity*!)
- 7. Web-based version with capability for detailed analytics
- 8. To include registered and certified tree nurseries in various locations and tree species available
 - a. Connecting tree growers with local tree nurseries (e-commerce for forestry)

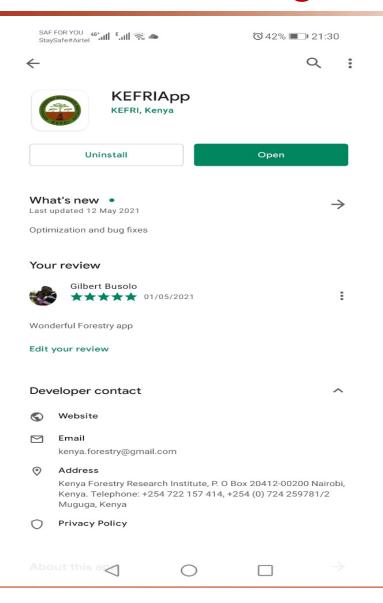
Who Can Use –The App



- •Public institutions (Ministries, State Agencies in both levels of Government);
- NGOs (Local and International)
- Development partners
- Private companies
- Community groups
- Tree nursery owners
- •Individuals (hopes to capture this main group of tree growers who are not usually captured)



How to get Access to KEFRIApp

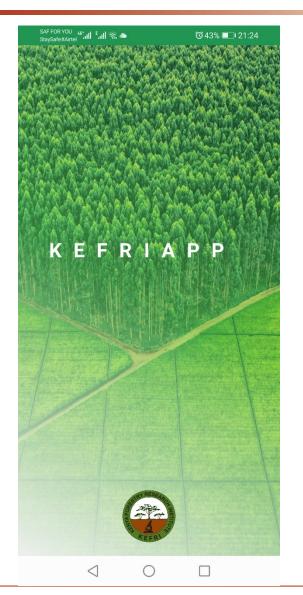


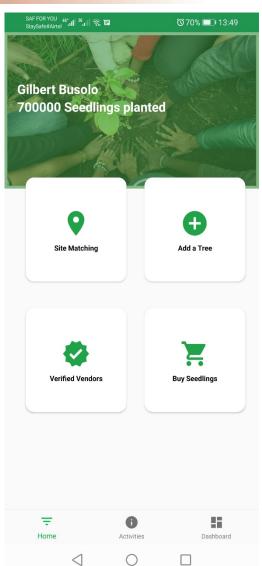
Steps:

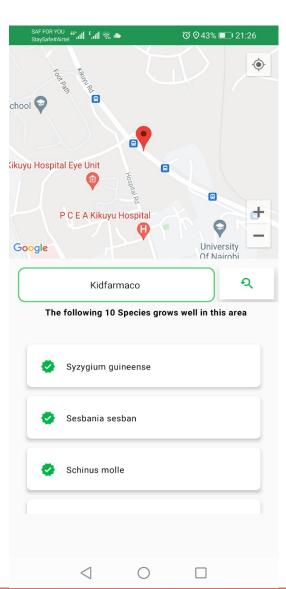
- Using Android Phone-Go to Google play store. Apple version on the way
- Download the KEFRI App
- Register
- Login
- Bravo!! Use the App
- Note. Ensure that your phone's location service is enabled for best results



KEFRIApp

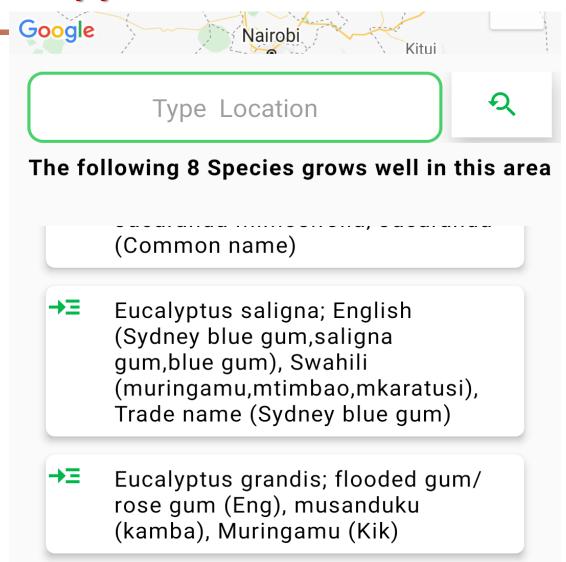






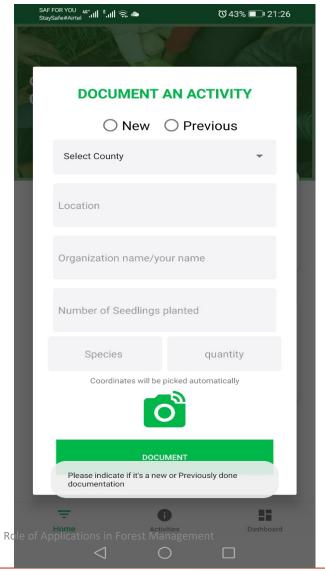
KEFRIApp



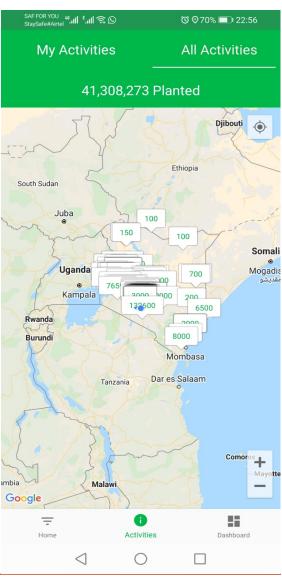


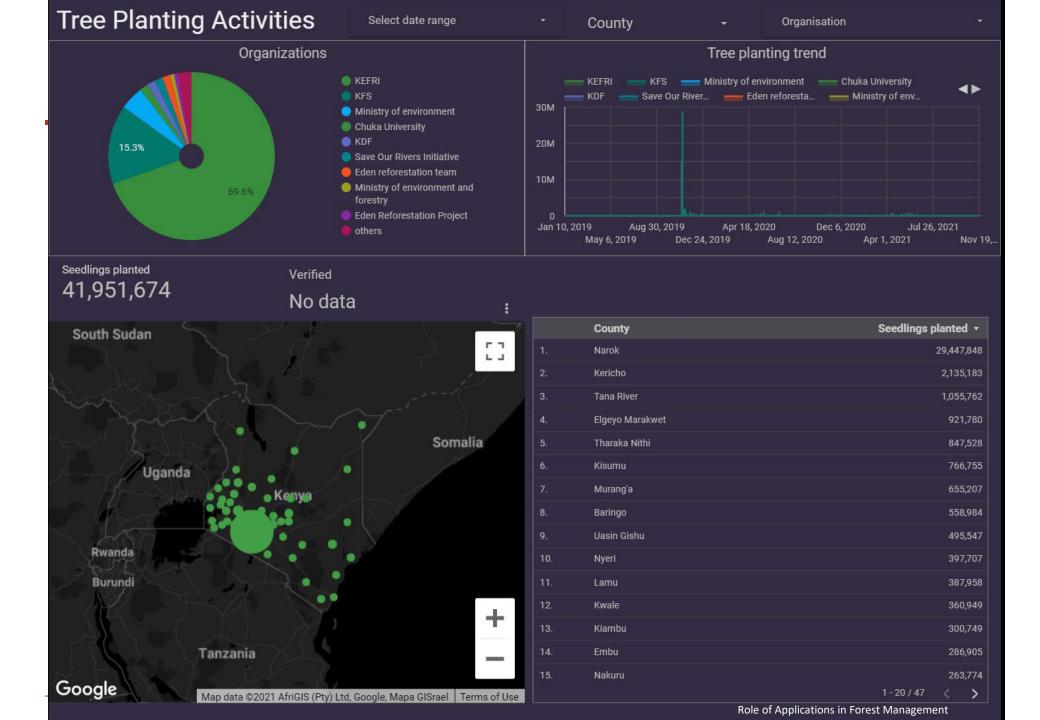


KEFRIApp





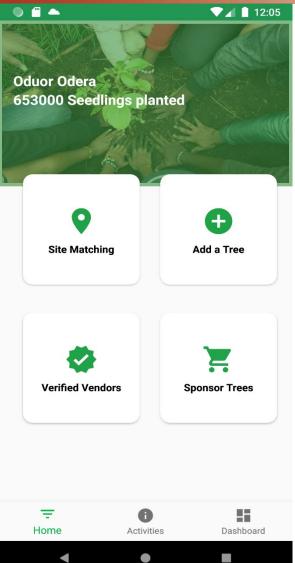




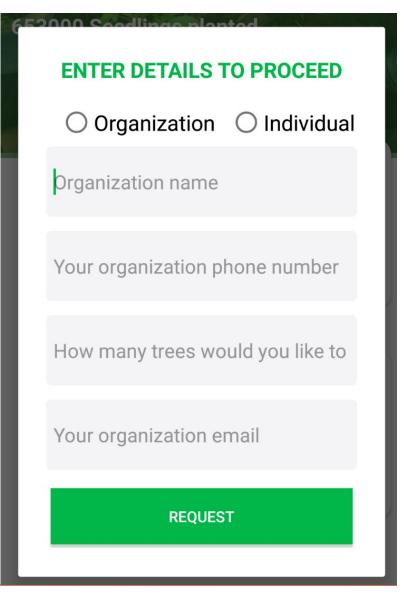


KEFRIApp Sponsor a Tree





New feature that onboards you as our partner towards 10% tree cover



KEFRIApp Roll Out



- ➤ Create awareness and train tree growers on how to use the KEFRIApp
- ➤ Provide periodic data updates towards attainment of 10% tree cover
- ➤ Partner with County Governments and other Institutions for enhanced KEFRIApp awareness, uptake and utilization
- ➤ Strengthen Monitoring and Evaluation Component Survival rate
- >Will be reviewed from time to time
- ➤Open to integrating with other Apps for wholistic data capture in the country

Acknowledgement

- Cabinet Secretary Hon. Keriako Tobiko and Principal Secretary, Dr. Chris Kiptoo, Ministry of Forestry and Forestry for
 - ➤ Spearheading the development and implementation of the National Strategy for Achieving and Maintaining 10% Forest Cover by 2022
 - ➤ Continuously supporting the development of innovations in forestry and environment for socio-economic development
- State Agencies in the Ministry, KFS, KWTA, NEMA, NECC, Environment Tribunal and NETFUND, KMD and the Ministry Departments for supporting and adopting technologies
- ➤ Kenya Government through The National Treasury for funding 10% Tree Cover activities
- ➤ You for installing KEFRIApp and helping to track tree growing and restoration activities in the country
- ➤ Conference organizers for accepting this presentation

Case study of the restoration of the Tana Delta

Presenter: Rudolf Makhanu, Nature Kenya































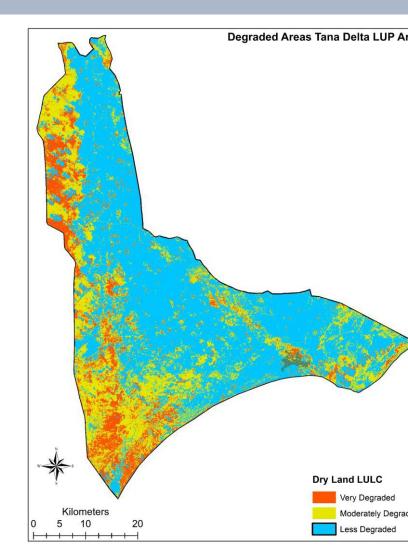






Catalyzing Landscape Restoration at County Level-Case of Tana River and Lamu County

- 1. Tana River Delta Strategic Environmental Assessment
- 2. Tana River Delta Land Use Plan
- 3. Ecosystem Services Assessment
- 4. Restoration Opportunity Assessment and Mapping
- 5. Mainstreaming landscape restoration into county policy frameworks-Providing practical actions and county targets by integration of restoration into county planning processes



Building Capacity of Institutions

- 1. Setting up and building capacity of WRUAs and CFAs who would set up tree nurseries,
- 2. Village Natural Resource Committees—carrying out village level restoration action plan-

Sustainability of Forest and Landscape Restoration

- Green Industrial Park concept-aimed at achieving and delivering green value chains while
- 2. Mainstreaming Restoration into Other Sectors of the Economy-Climate Smart Agriculture; Indigenous Community Conservation Area
- 3. Innovative Financing- Green Climate Fund, Carbon Financing



Work Supported By



































Forest Landscape Restoration (FLR) in East Africa – political framework and pilot measures for the successful implementation of FLR strategies project

Presenter: Kiunga Kareko, WWF-Kenya Forest Programme Manager





































Project Details



Duration: Five years (2021-2024)

Budget: KSh 131M

Donor: German Federal Ministry of Economic Cooperation and Development (BMZ) through its BENGO-Climate funding facility

Implementers: WWF Kenya & the National Alliance of Community Forest Associations (NACOFA)

Background



- Responding to <u>negative ecological and economic implications</u> faced by large areas of East and Southeast Africa due to extensive deforestation.
- The key shared objective: To prevent further deforestation and restore the functionality and connectivity of degraded forest landscapes (Forest Landscape Restauration, FLR)
- The 3 countries (Kenya, Tanzania & Zambia) are now committed to the objectives of the Bonn Challenge (https://www.bonnchallenge.org/about; 2011, 350M ha by 2030, total pledge 74 countries, 31 in Africa), AFR100 Initiative (https://afr100.org/; 2015, 100M ha by 2030; total pledge 31 countries, 126M ha (December 2020); "New York Declaration on Forests" (2014; 200 endorsers; end natural forest loss by 2030, and Sustainable Development Goal 15 (Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss).
- The key objective of these international initiatives is to globally restore 350 million hectares of forest landscapes including at least 100 million hectares in Africa.
- To be achieved through creating powerful national strategies with both legal and political planning frameworks within the region.

General overview



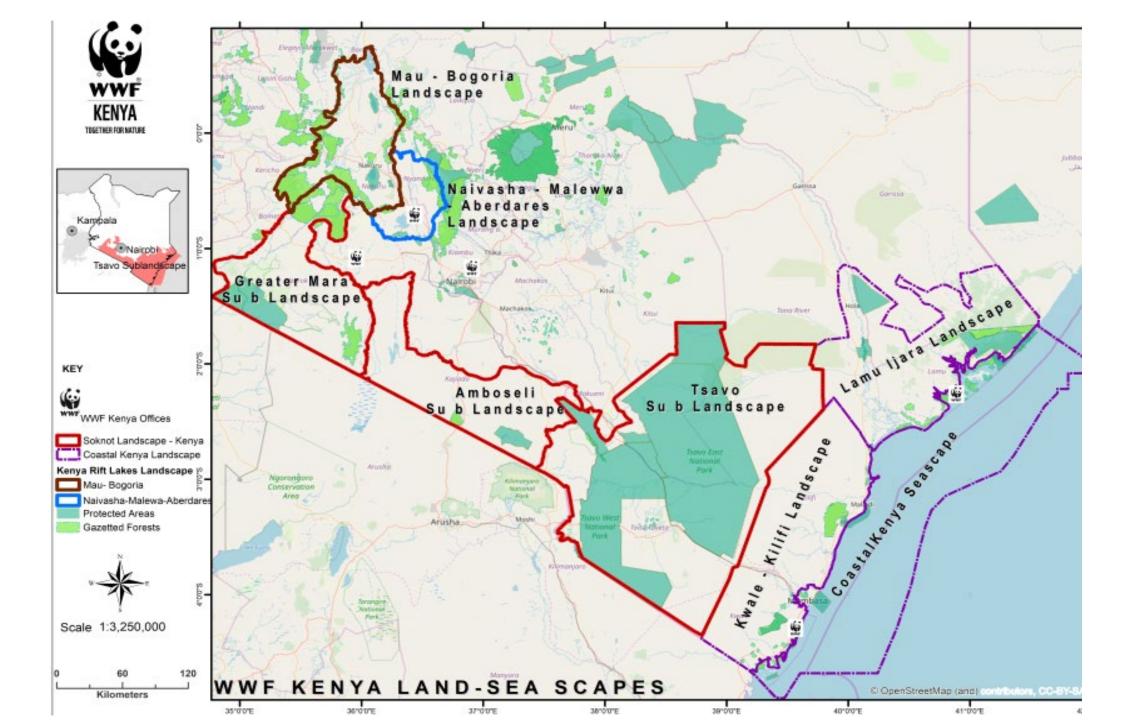
Outcome

Livelihoods of 4 communities in Kenya are improved through model FLR activities, leading to an increase of income from sustainable agriculture and forest production of at least 20%. National forest landscape restoration policy frameworks securing ecosystem services, resource availability and benefit sharing mechanisms are strengthened by an active political participation of civil society actors

- 1. The development of national policies for FLR in Kenya is supported, thus securing the base for a successful implementation of the pledged AFR100 contributions. The participative policy improvement secures future benefits and sustainable resource management for communities and small holders.
- 2. FLR business model on sustainable production of products from forest landscapes is implemented and leads to increased income for min. 400 beneficiaries in 4 communities in the selected landscape.

3. In the Kenyan forest model landscapes, key areas are restored and sustainably contributing to an increased harvest/yield of timber, NTFPs and conservation agriculture products (quality/quantity).

4. By 2024, **improved exchange** between partners enables **scaling of project's good practices** – including incorporation of social safeguards – on national and international level.





FLR in Naivasha: Specific Objective

To improve agriculture and forest production systems of forest communities in Nyandarua County through enhanced political framework and successful implementation of FLR strategies.











































Joint Efforts & Scope

- Three (3) Community Forest Associations (CFAs): Geta, North Kanangop & Aberdare Kiburu
- Three Water Resource Users Associations (WRUAs): Mkungi Kitiri, Upper Turasha Kinja and Wanjohi
- Kenya Forest Service
- Nyandarua County Government

Restore

500 ha of Bamboo and mixed forest in the gazetted forest 40 km of riparian land mostly on farmlands 100 ha of deforested or degraded farmlands.

"Sustainably managed by the communities through an effective business model for bamboo and agroforestry benefiting communities"

OUTPUTS

- 1.1: FLR implementation in Kenya is supported by effective policies, strategies, legislations and guidelines and enhancing the development and implication of the target groups
- 1.2: A national civil society FLR Alliance is strengthened and informing policy making processes
- 1.3: A FLR strategy for Nyandarua county is in place
- 2.1: Income from forestry and agriculture value chains is increased by 20% for at least 400 community members in Nyandarua
- 2.2: Target communities have reliable acces to markets and value-addition facilities for forestry and agricultural products
- 3.1: 500 ha Bamboo and mixed forest and 100 ha of degraded farmland are restored and sustainably managed by the communities through i.e. an effective business model benefiting communities

OUTPUTS Cont.

- 3.2: 40km stretches of riparian area are restored
- 4.1: Successful FLR initiatives are documented, published and presented for upscaling and replication outside the project area on national/regional and international level
- 4.2: Environmental and social safeguards and standards for Particpative Forest Management (PFM) are incorporated in WWF-supported programmes and adapted to local conditions









































together possible...

Mangrove Ecosystems Restoration.

Community Based Initiatives.





Derrick Muyodi.
CEO, Ceriops Environmental
Research Organization.
www.ceriops.org
12, July 2021.



Content

- 1 Introduction: Who we are.
- Mangroves Ecosystems: Importance & Threats
- Mangroves Restoration: Project Adopt A Site.
- 4 Program Impacts Assessment
- Monitoring Technology: Project Treestand.

Ceriops Pillars



Vision Statement

To promote integrated coastal zone management while conserving natural ecosystems in the East African Coastal Region.

Mission

To restore degraded coastal ecosystems with **local communities** while exploring additional **livelihoods** from **coastal & marine resources**.

Core Values

Quality Delivery | Teamwork | Respect | Integrity.



About Us



What we do.

A canopy non profit network of environmental management experts with focus on integrated natural ecosystems research & development programs with direct impact to local communities.

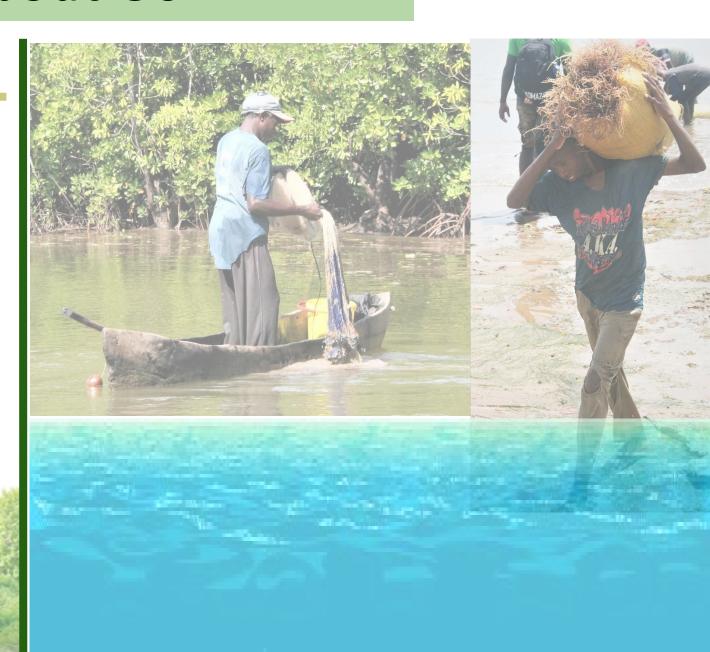
Our expertise include;

- Mangrove Ecosystems Restoration & Livelihoods.
- Forestry Research & Technology Innovations.
- Community Seaweed Farming
- Marine Litter Research
- Experimental models for sustainable Agriculture.

We also develop data systems for commercial environmental programs; Forestry, Agriculture, Spatial planning, Urban planning & Waste Management.

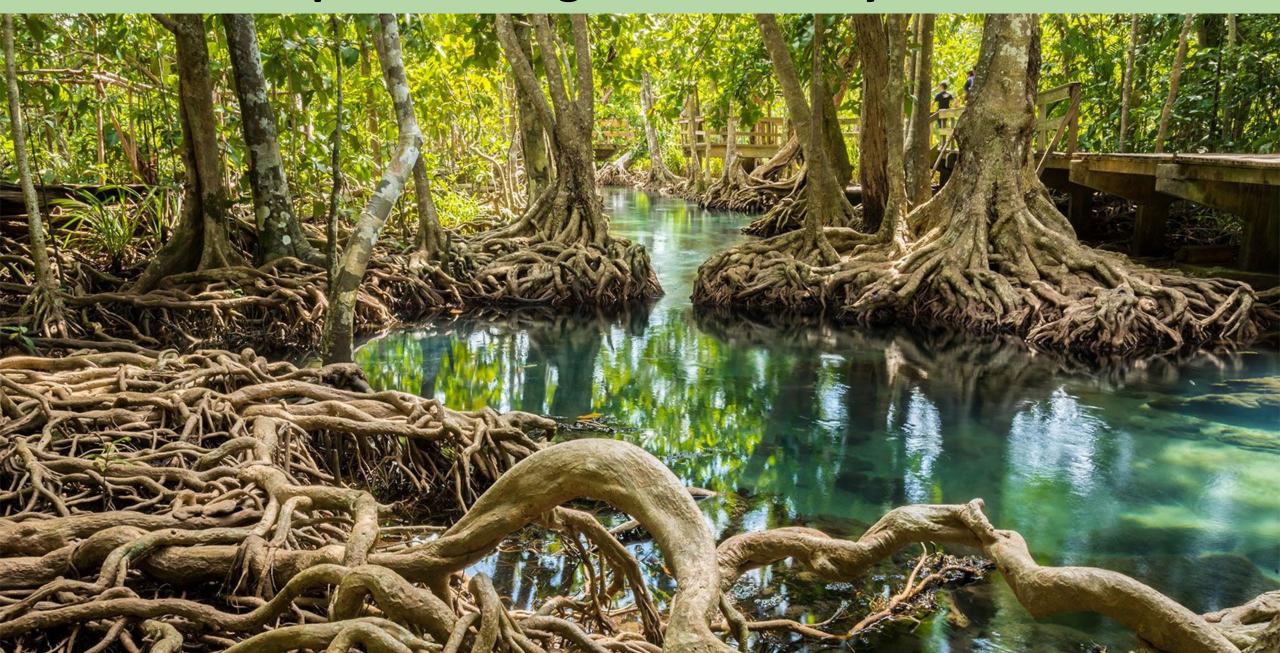
Website: www.ceriops.org

Mail: info@ceriops.org . Contact: (+254)718171308



Tropical Mangroves Ecosystems





ECOSYSTEM SERVICES

The benefits people derive from mangroves



Livelihoods

120 million people living



Mangrove ecosystem services

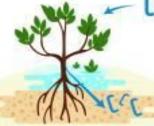
Worth US\$ 33,000-57,000 per hectare per year1 x 14 million hectares2 = up to US\$ 800 billion per year







near mangroves



Climate regulation

Carbon storage potential of mangroves is 3-5x higher than that of tropical upland forest due to strong carbon storage in the soil3; CO2 released by global mangrove loss annually could be as high as the annual emissions of Australia4-5



Wood

Its density makes mangrove wood a valued source of timber and fuel



Coastal protection

Restoring mangroves for coastal defence up to 5 times more costeffective than "grey infrastructure" such as breakwaters9



Water filtration

2-5 hectares of mangroves may treat the effluents of 1 hectare of aguaculture8



Tourism

There are over 2,000 mangroverelated attractions globally, such as boat tours, boardwalks, kayaking and fishing7



Fisheries

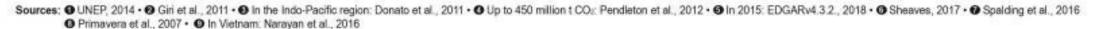
More than 3000 fish species are found in mangrove ecosystems6











Mangroves Threats & Need for Urgent Action.



Drivers

Rapid Urban Development

Demand for wood & poles

Mining for minerals

Illegal logging

Conflicts with Conservators

Massive urban pollution

Rapid industrialization

Growing residential estates

Result



















Degraded areas (Google Earth View.)



Satellite Earth
observation of the
Mangroves
Ecosystem

- Sections of the project area.

Mapped polygons.





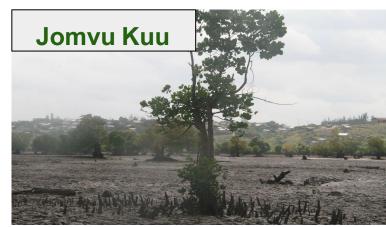
Snapshot: Ground Imaging.

Mombasa

Mombasa

Kwale















Suitability Classification.

CLASS 1: Regenerating





CLASS 2: Sedimented





CLASS 3: Degraded





Tudor Creek CBOs:

Project Adopt A Site

1. Big Ship



2. Bidii Creek



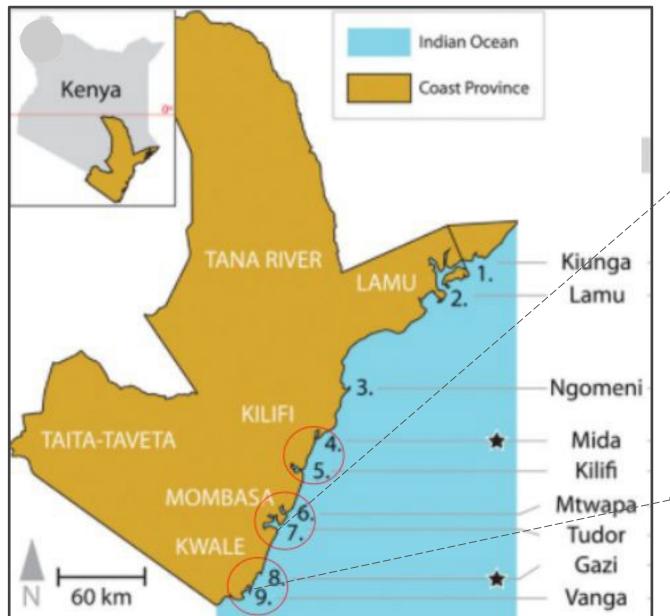
3. Amani Jipange





Project Location.





Mombasa: 1000 Ha

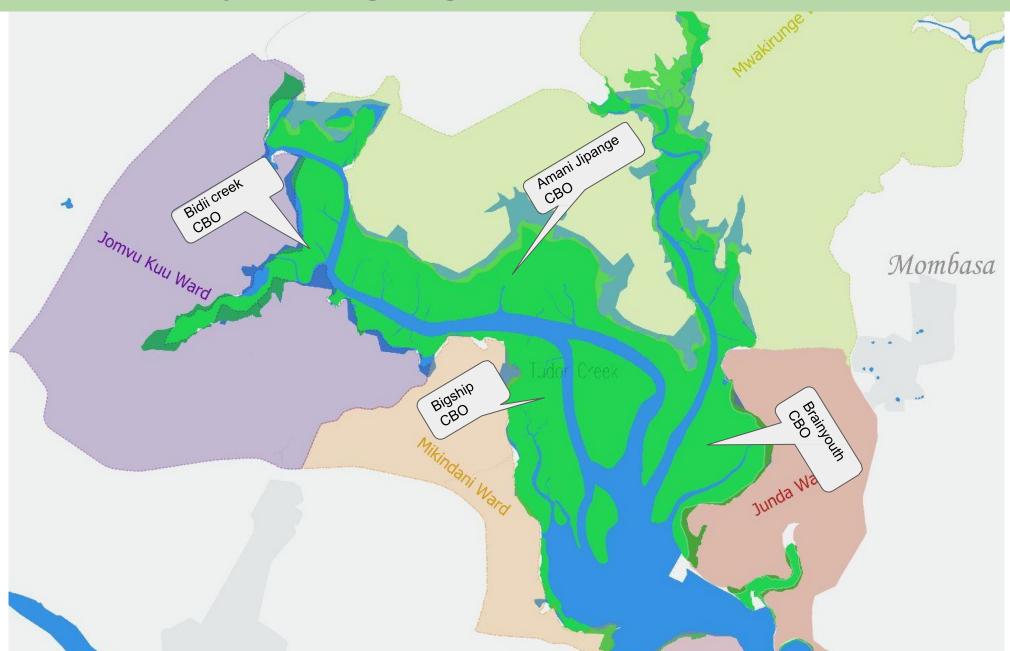


Kwale: 1500 Ha



Snapshot: Map Imaging.







Adopt A Site: Project Model

Needs to be Addressed

CSR Obligations

Mangrove Conservation

Community Empowerment



Corporate Social Obligations Will be met.

- Concrete technical report of the Adopt-A-Site to the Stakeholder.
- ✓ Increased Forest Cover of Mangroves in the selected area.
- Empowered Mangrove community hence Poverty Alleviation.

OBJECTIVES

Mangrove Planting (500 +seedlings).

Entails buying of seedlings and participating in the planting exercise (planting with the community). Provide Nature Based Community Livelihood Project

Entails supporting crab farming, ecotourism and bee keeping (mangrove honey production)

> Next 6 Months

Participate in Monitoring of the outlaid activities

Support the community groups (beneficiaries) in sustainability of the livelihood projects through capacity building.

Subsequent Years

1st 6 Month

Tudor Creek Mangrove area: Mombasa, Kenya. CERJOPS



Case Study: Tudor Creek Mombasa

Concept Test: Mombasa

Project: Adopt A site.

Start Year: 2018.

Community: Ganahola.

CBO: Big Ship CBO.

CFA: MOKICFA



Communities Based Restoration (CBR)



Community & stakeholders participation

Youth groups

- Women groups
- Intercommunity groups
- Learning Institutions
- Social groups

























PROGRAM IMPACTS



Planted 200+ HA

Mapped: 2000+ Ha

<u>CSR:</u> 50+ org.

Community 7 groups



















PROPOSED OBJECTIVES



Community Based Initiatives

- Scale up Mangrove tree nursery production to 1.5M seedlings/Year
- Scale up sustainable mangrove honey production to 300 kg/farmer groups.

Restoration:

- Map 2000 Ha for restoration of Degraded & Suitable for forest establishment
- Map 2500 ha for Conservation of existing second generation forest

Carbon Investment:

- Create 2000 ha of mangrove forest stand equating to 2.8MtC.

Community:

- Improve livelihood of 1000+ families through carbon finance benefit

Proposed Project Area.



- Baseline Survey and Remote mapping data for July 2020.
- Areas determined by physical characteristics and canopy density of less than 30% distribution cover per ha.

Location	Available Area (Ha)	Yr 1	Yr 2	Yr 3	Yr 4
Majoreni - Kibuyuni	1016.885	337Ha	236На	237Ha	206Ha
Mwazaro-Bodo-Funzi	416.324	115Ha	104Ha	99Ha	99Ha
Rabai-Mwakirunge	1016.578	252Ha	365Ha	355Ha	345Ha
Total Coverage	2750	704Ha	705Ha	691Ha	650Ha

Monitoring Program.













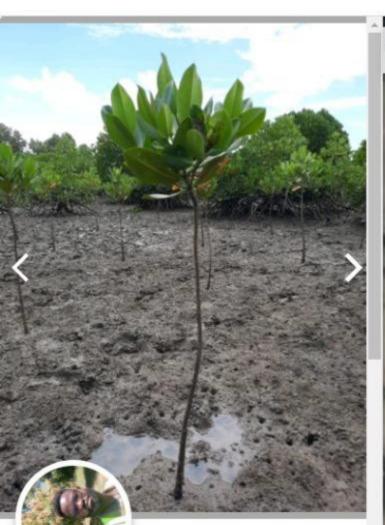
Tree Tracking: Restoration Monitoring

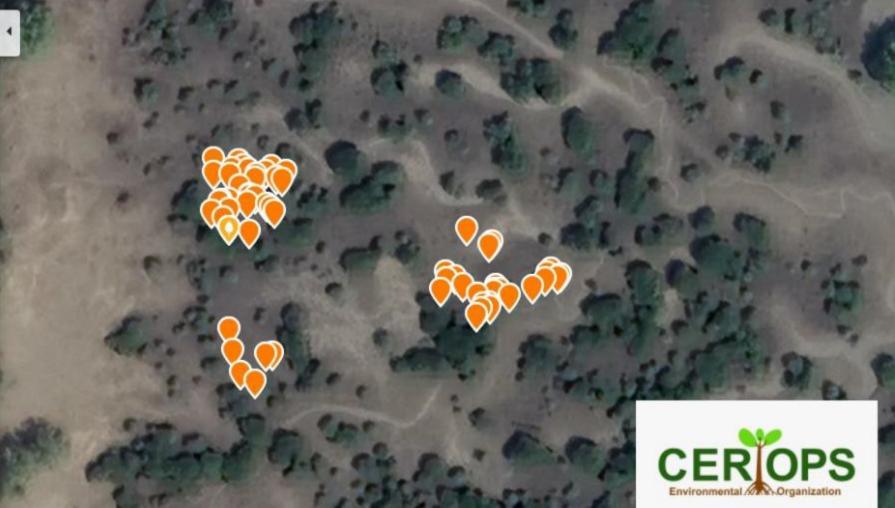


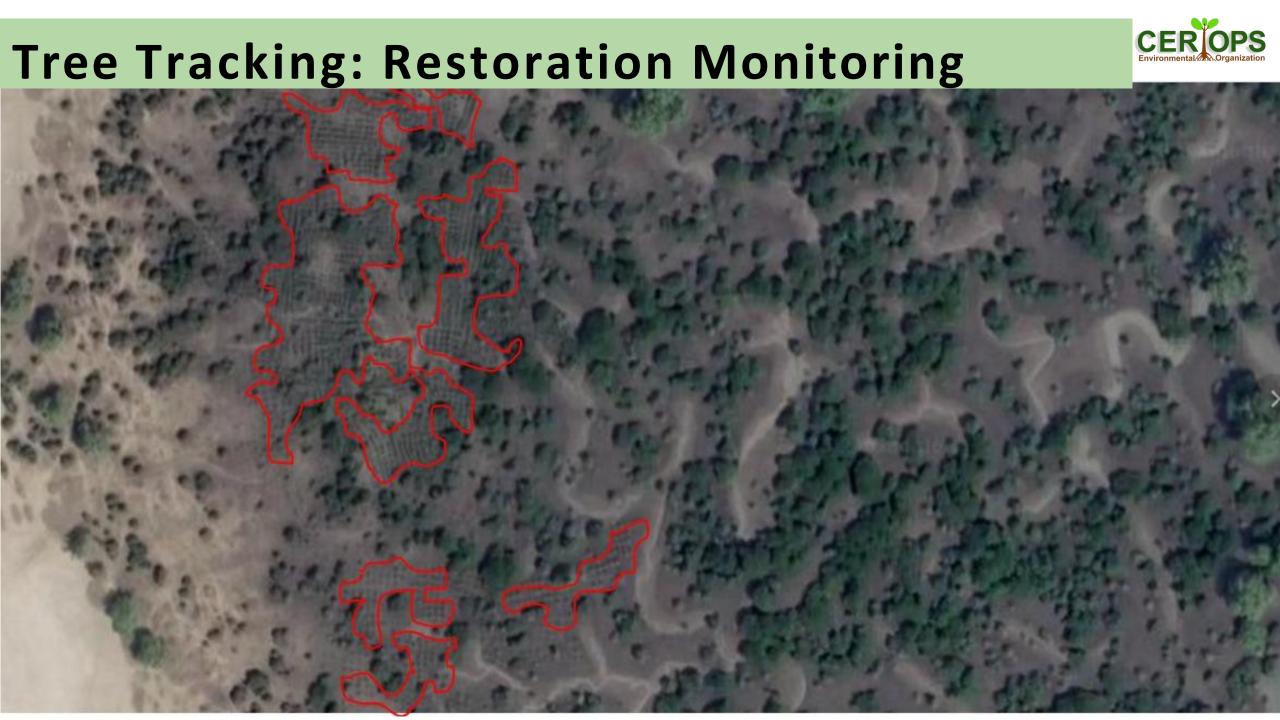
Android Application



Web based Tree Map

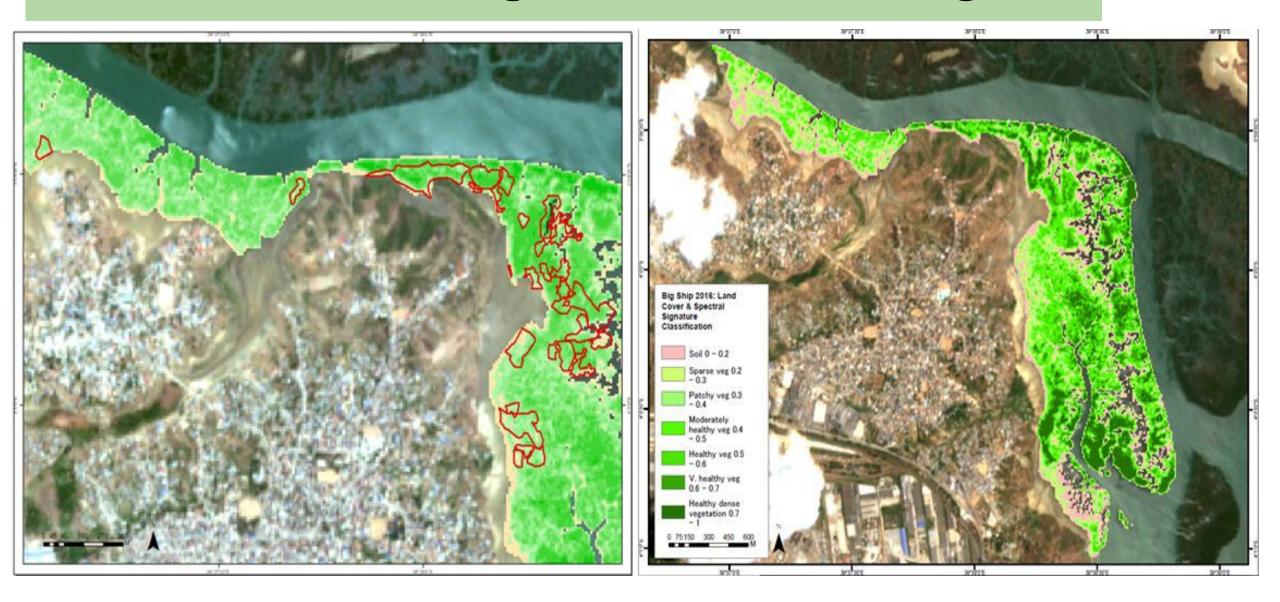








Remote sensing: Patches & Filling.





NDVI Change detection (2016-2020)

Analysis Area:

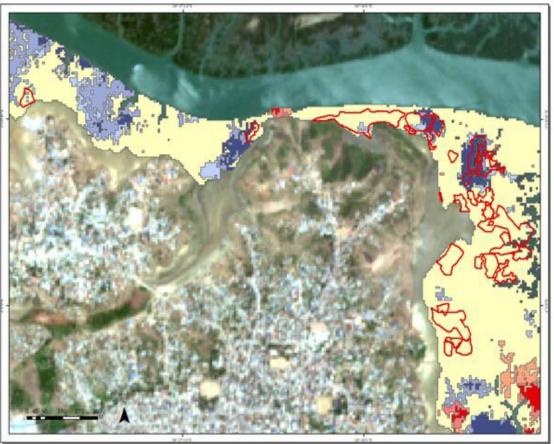
Loss: 11% - 30ha² / 0.3 km²

Growth: 5% - 15ha² / 0.15km²

Ceriops Sites: Concentrated growth

• Loss: 1% - 0.19 ha²/0.0019km²

Growth: 10% - 1.68 ha² / 0.0168km²



PROGRAM CHALLENGE (2016-2020)







Asante!



Partner with us to make this possible!

Contact us: info@ceriops.org

Visit our website: www.ceriops.org



Initiative for Sustainable Landscapes: ISLA

Presenter: Beatah Nzove, Senior Program Manager, ISLA Program Kenya, IDH, The Sustainable Trade Initiative













































































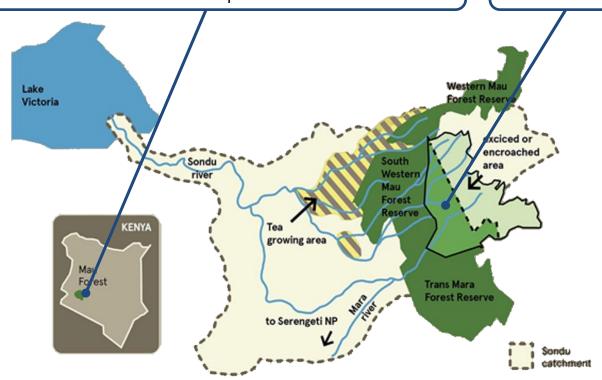
Location



South Western Mau Forest block in the Sondu River Basin ;60 000 hectares targeted for restoration and protection



20 000 hectares targeted for restoration













































Encroachment































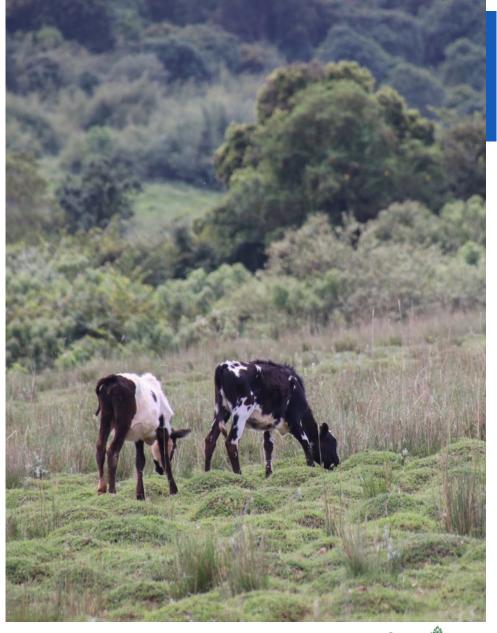












Livestock grazing and browsing









































Wood extraction for charcoal and firewood









































Fire and poaching











































Tea Private Sector Partners









Public/Government partners













Corporate Partners



NGOs and Civil Societies







Implementing Partners



IFCMS





Other Partners: Ministry of the Foreign Affairs of the Kingdom of Netherlands, CIFOR, IDH, P4F (DfID)

































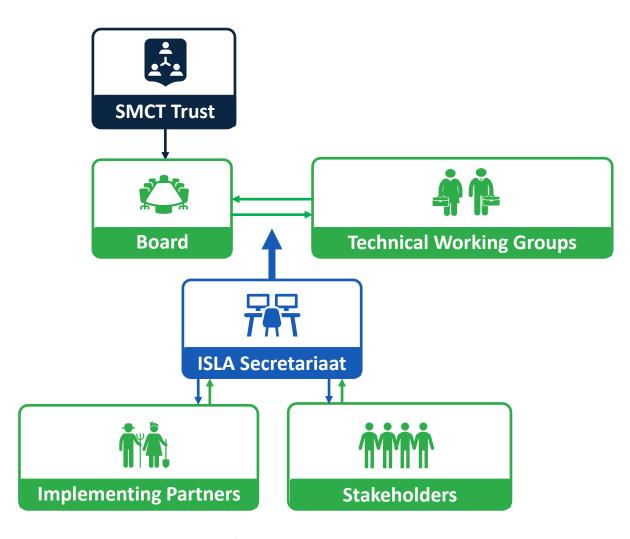








Governance













































1. FOREST CONSERVATION

Done through:

- Adopt a forest
- Capacity building of CFAs
- Dairy Value Chain Development
- Addressing illegal forest activities; Surveillance flights, Bongo surveillance projects and enhanced law enforcement































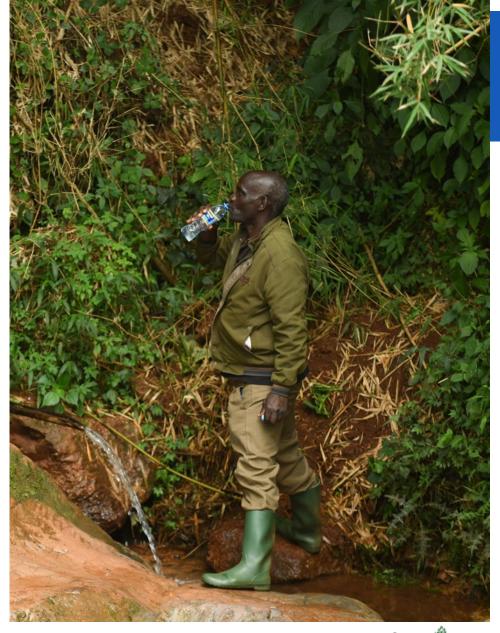












2. WATER FLOW AND ACCESS

Done through:

- Strengthening WRUAs
- Springs rehabilitation and protection











































3. SUSTAINABLE ENERGY

Done through:

Community access to sustainable energy









































4. IMPROVED LIVELIHOODS

The theme on improved livelihoods cuts across all the three themes

































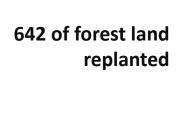








Key Achievements







50% public and private sector funding

22.7% increase in forest regeneration between 2014 and 2018







A sustainability vehicle-**SMCT** developed

Reduction in livestock grazing in the forest from 24000 heads to 17 263 heads between 2016 and 2019





Participatory Forest management plans developed for all 5 CFAs in the landscape









































Plans for Phase II 2021-2025





Upscale Interventions in the 1st phase; -Forest conservation -Dairy VC **Development** -Water Rehabilitation -Ecotourism



Increase collaboration to lower number of cattle in the forest in order to speed up forest regeneration



Operationalize the ISLA Sustainability vehicle; Stawisha Mau Charitable **Trust**













program











































































Community Forest Land Restoration Efforts and Programs

Gerald Ngatia, NACOFA Secretary













































Community involvement in forest land restoration

- Communities' world over not just in Kenya play a vital role in protection and sustainable management of forests.
- Protection and sustainable management of forests was a cultural practice that has been practiced over the years by many ethnic groups in this country.
- However, this tradition has been eroded through the years by economic pressures exerted on our forests through the years













































Community Forest Associations (CFAS) Involvement In Forest Land Restoration

- Forest laws in Kenya have recognized communities as important stakeholder in protection and sustainable management of forests.
- There are over three hundred registered CFAs in Kenya today many operating in gazette forest blocks and others in community and county forests.
- The CFAs bring together communities living adjacent to forests in implementation legal and well coordinated forest utilization, protection and rehabilitation programs.
- Kenya Forest Service Officers (KFS) on the ground provide guidance and technical support to the CFA members
- National Alliance of Community Forest Associations (NACOFA) is the network that brings together all CFAs in the country and is the nation voice and linkage both to the government and various partners between on matters of policy and community issues.









































Community and KFS collaboration and other partners



- CFA members loading indigenous tree seedlings on a Kenya Forest Service vehicle in South Kinangop (Aberdares) for planting on a degraded forest site in May 2021
- Over 40,000 mixed indigenous tree seedlings planted by that CFA this year in that forest station with facilitation by WWF-Kenya and NACOFA















































Community collaboration with private sector and other government agencies

Commuinty members Of Mombasa Kilindini CFA rehabilitating a **Mangrove Forest**

with support from Kenya national **Highways Authority (KENHA)**

Some other Communities in the coast region are earning Carbon credits from their Efforts in restoration of Mangrove forests. (Mikoko pamoja project in Kwale)













































Community efforts in tree seedling production

- Nearly all CFAs in the country have tree nurseries that produce wide range of mixed indigenous tree seedlings for forest land rehabilitation programs, Exotic tree seedlings for plantation development, Fruit tree and Bamboo seedlings for on farm and riparian areas planting.
- Tree seedling production capacity ranging from 20,000 to over 500,000) annually per CFA depending on capacity to fund raise or attract partnership of each particular CFA
- All these efforts have assisted in increasing tree cover in the country.
- Kabaru CFA in collaboration with KFS presently (as at July 2021) has a stock of Six Hundred and Thirty Two tree seedlings in their tree nursery ready for planting this year.
- The only major challenge being limited market for seedlings which at times over grow in tree nurseries and go to waste. Thus demotivating the communities.













































Successes in legal frameworks



- Having in place good legal frame works that recognize environment is an assent for the wellbeing of citizens and also big opportunity in this country (The Constitution, Forest Act, EMCA, Water Act, Wildlife Act etc)
- Community recognition in various laws in the environment sector is also a big opportunity and success in this sector.
- Forest Sector; Community Forest Associations(CFAs)
- Water Sector; Water Resource Users Associations (WRUAs)
- EMCA; County Environmental Committees
- Wildlife Act; County Wildlife Compensation Committees











































THANK YOU! ASANTE!

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