5TH INTERNATIONAL CONGRESS ON PLANTED FORESTS

Session 3b: Planted forests in productive, resilient and restored landscapes

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5TH INTERNATIONAL CONGRESS ON PLANTED FORESTS

S3b: Planted forests in productive, resilient and restored landscapes

Speaker	Title
Saleh Alzamana	Challenges and opportunities for planted forests in dry ecosystems: the experience of Saudi Arabia
Muhanguzi Hosea	An assessment and monitoring of forestation planting in remnant natural forests in the Lake Victoria crescent
Belachew Gizachew	Australian tree species and provenances in Ethiopia-The Case of Eucalyptus globulus plantations
Francis Chilimampunga	Planted forests in Malawi
	10 min time for questions by the audience for all previous speakers
Nivo Malalatiana Randriambao	Reforestation in Madagascar
Peter Angaine	Morphometrics of Pinus patula crown and its effect oncone characteristics and seed yield in Kenya
Alex Amanya & Sheila Garakara	Restoring our Forests to Enhance Food Security and Improve the Livelihoods of Smallholder Farmers in East and Southern Africa
Leila Ndalilo	On-farm forestry: A key strategy for enhancing tree cover in the Western Region of Kenya
	10 min time for questions by the audience for all previous speakers

- **AN ASSESSMENT OF RESTORATION PLANTING IN REMNANT NATURAL FORESTS IN THE LAKE VICTORIA CRESCENT, UGANDA**

Muhanguzi Hosea

Introduction

The remnant tropical rainforests in the L. Victoria crescent are vital ecosystems for the whole of the East African region. They protect an important water catchment area for Lake Victoria (NFA, 2007) and River Nile.

- Popular for their high biodiversity and are a source of livelihood to many people (Baranga *et al*., 2009).
- However, they are being destroyed and degraded at alarming rates.

- **To promote recovery of the forests, the Uganda's National Forestry Authority (NFA) has been engaged in restoration tree planting in selected forest reserves located in the area including Luwafu, Gangu, Navuguru, Nawandigi and Koba block.**
- **Implemented between 2013 and 2019 in partnership with several corporate bodies.**

PROBLEM

- Records, literature and inquiry indicate that up to date, no systematic and comprehensive assessment has established the forests' extents of recovery
    - Tree abundance, species composition and factors affecting the attainment of the intended restoration goals.
- Hence,

OBJECTIVES

among other objectives, we determined;

- The abundance and sizes (DBH) of the planted and naturally regenerated trees in the target forests.
- The species richness and diversity of the planted and naturally regenerated trees in the target forests.
- Factors affecting growth and survival of the planted and naturally regenerated trees in the target forests.

METHODS

- In-forest surveys based on established transects and plots.
- Stakeholder engagements – interviews and discussions involving NFA staff and relevant community members.

FINDINGS

Many planted trees survived and have now grown into big trees,

Also, many trees and other forest plants have since naturally regenerated in the restored areas.

++ other forms of biodiversity noted in the restored forests – birds, primates, butterflies etc.

++ The restored are contributing to local livelihoods in various ways – firewood, water sources, poles etc.

- A total of 75 species were recorded in all the forests of which 10.7 % (n =8) were planted during the restoration while others naturally regenerated.
- The planted species were *Albizzia coriaria, Cedrella ordorata, Croton Africana, Khaya anthotheca, Markhamia lutea, Terminaria superba, Maesopsis eminii and Prunus africana*.

- All enumerated trees ≥ 10 cm DBH had a mean stem density of 504/hectare and the planted ones constituted 49.0%.
- A relatively higher tree species composition (n= 49) but lower tree abundance/ha (n = 439) was recorded in forests restored over 30 years ago while the forests restored about 20 years ago had lower species composition (n < 30) but higher stem density (>500/ha).

Abundance, sizes and species composition of trees ≥ 10 cm DBH	Forests				
	Gangu	Nawandigi	Koba block	Luwafu	Nakagga
Stem density of trees/ha	524 (P = 69.0 %)	439 (P = 22.0 %)	530 (P = 55.0 %)	562 (P = 48.0 %)	464. Planted not known
Number of big stems (> 40 cm DBH)/ha	None	88	8	21	28
Number of tree species recorded in the forest	26	49	29	28	52
Most frequent tree species and its abundance	Terminaria spp, n = ???	Khaya Anthotheca & Bosquia phoberos, n = 44 each	Cedrella ordorata, n = 120	?Kisissia followed by nkuzanyana	Eucalyptus spp
Largest tree species and its size (DBH/cm)	Trema orientalis, DBH = 30	Khaya anthotheca, DBH = 96 cm	Cordia millenii, DBH = 43	Muziru, 58	Piptaneniastrum africanum, DBH = 43

Key factors affecting recovery of forests

- Affected by various factors including;
  - Firewood extraction.
  - Charcoal burning.
  - Growing crops and grazing livestock.
  - Extraction of herbal medicine.
  - Garbage dumping.
  - Brick making and establishment of some infrastructure.
  - Inadequate supervision of the restored forests.

Extraction of Fuelwood

Charcoal burning

Charcoal burning - cont

Crop growing and grazing livestock in the restored forests

A garden of coffee in a restored area of Nawandigi CFR

Extraction of bark of some planted such as *Prunus spp* trees in the restored Koba block forest for herbal medicine

A garbage dumping site in the restored areas of Gangu CFR

A belt cut through a CFR for establishment of electricity gridlines and road construction through a forest reserve

Inadequate supervision of the restored forests

- Absence of forest stations closely located near forest reserves, few staff and inadequate/insufficient transport

Conclusions

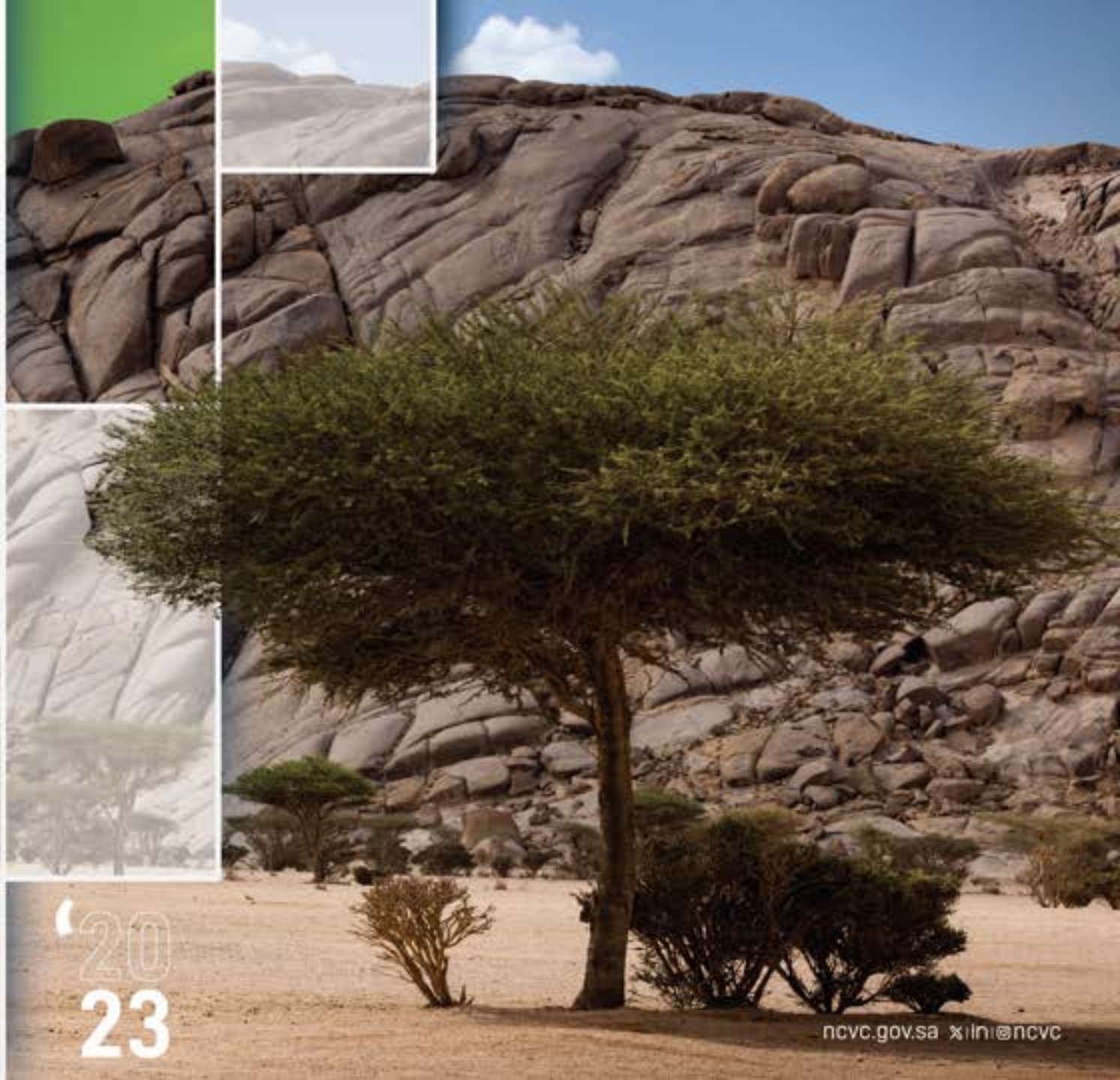
- The restoration planting carried out in the forests has led to increased forest cover, other forms of biodiversity and ecosystem services and is contributing to livelihoods.
- Un fortunately, those restored forests are currently being destroyed and degraded at high rates. At this rate of destruction, most of them including Luwafu CFR may completely disappear in the next few years.

Recommendations

- Government and other stakeholders STRENGTHEN CAPACITY of NFA to adequately manage the forests – increase numbers of on-the-ground staff/SUPERVISORS, adequate means of quick transport e.g motor bikes, establish stations nearby the forest reserves, TECHNOLOGY, etc.
- Develop strategies of actively involving local communities adjacent to the forests in the restoration programmes and general management of the forests.
- Sensitise and engage public including Policy makers, local leaders, NGOs, general public, etc to support conservation of TRF.
- ??MORE STRATEGIES…..

المركز الوطني لتنمية الغطاء النباتي ومكافحة التصحر
National Center for Vegetation Cover Development & Combating Desertification

Challenges and Opportunities for Planted Forests in Dry Ecosystems: The Experience of Saudi Arabia



Nairobi, Kenya

Dr. Saleh AL Zamanan

5th International Congress on Planted Forests

Saudi Green Initiative - Overview

- The initiative aims to improve the quality of life and protect future generations in the Kingdom
- The initiative will increase Saudi Arabia's dependence on clean energy, offset the impact of fossil fuels, and combat climate change

Key SGI activities

Increase vegetation cover and combat desertification

Increase the share of clean energy

Conserve biodiversity and ecosystems

Reduce GHG emissions

Transition to circular economy

Key facts

❖ **Location**:

Saudi Arabia is located in the Middle East, on the Arabian Peninsula.

❖ **Geography**:

The country's landscape is characterized by vast deserts, including the Rub' al Khali (Empty Quarter), which is one of the largest continuous sand deserts in the world.

❖ **Climate**:

Saudi Arabia has a predominantly arid desert climate characterized by high temperatures and very little rainfall.

NCVC – with a clear vision and mission – has its strategic objectives span across 4 main categories: Forests, Rangelands, National Parks & Biodiversity

VISION

A flourishing and diverse vegetation cover that promotes environmental sustainability and contributes to quality of life

MISSION

Provide capabilities, implement programs, and strengthen partnerships for the development and sustainability of the vegetation cover and combating desertification

STRATEGIC OBJECTIVES

Key Categories

FORESTS

Sustainably **manage forests** and mitigate the effects of **anthropogenic and natural threats**

RANGELANDS

Regulate and sustainably **manage rangelands**, **preserve plant diversity** and **rehabilitate degraded rangelands**

PLANT DIVERSITY AND COMBATING DESERTIFICATION

Develop and **expand the vegetation cover and protect its diversity** and implement **desertification monitoring and mitigation programs and treaties**

NATIONAL PARKS

Sustainably **manage and develop the infrastructure and conserve natural ecosystems** of **national parks**

Enablers

- **Build knowledge base**, and **set adequate incentives to support innovation and the use of modern techniques** in the field of vegetation cover and combatting desertification
- Strengthen **partnerships with local communities and the private sector** to support the development of vegetation cover and associated economic activities
- **Build human and technical capabilities** in the field of vegetation cover and combatting desertification

Forest classification in KSA

1. Mountain forests
2. Valley forests
3. Mangrove forests

OVERVIEW of SAUDI mangroves

Mangroves play an important role in the coastal ecosystem and they represent one of the principal vegetation habitats along the Red Sea coast.

A heron surveys its surroundings from a canopy perch in mangrove wetlands at dusk. Photo: KAUST

Benefits

Coastal Protection
Mangroves increase costal protection against storms and reduce wave heights. They also protect against erosion of coastlines.

Water Filtration
Mangroves improve water quality and clarity

Fish
Mangroves provide habitat for a broad range of important fish species

Mangrove species

Saudi Arabia is home to only 2 species of mangroves, which are prominent and widely recognized species are:

❖ **Avicennia marina :**

Also known as the grey mangrove, it is one of the most common mangrove species in Saudi Arabia. It is well adapted to the harsh conditions of the coastal environment, including high salinity and tidal fluctuations.

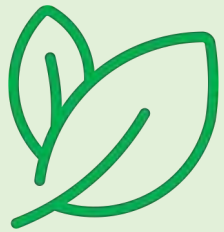
❖ **Rhizophora mucronate :**

It is commonly known as the red mangrove. It is characterized by its distinctive prop roots that extend above the water's surface and provide support to the tree.

KSA's mangroves are predominately present at the red sea with significant cover permanently lost due to urban expansion

Mangroves definition and presence

Sustainably **manage forests** and mitigate the effects of **anthropogenic and natural threats**



Current mangroves cover status

30 MN

existing trees

Current mangroves cover status

15,140 HA

total land area

- **95%** on the Red Sea
- **5%** on the Arabian Gulf

1. Intertidal zones : areas where sea meets the land between high and low tides
Source: GIS analysis, provided by Consortium and technical specialists; Pictures' sources: Consortium fields visits (Farasan islands in Jazan)

Lack of **protection and overgrazing** causing mangroves **degradation**

Conservation of natural forests (Farasan Islands)

Assessment of mangrove forest degradation

Assessment of mangrove forest degradation

Nursery Establishment and Seedling Production

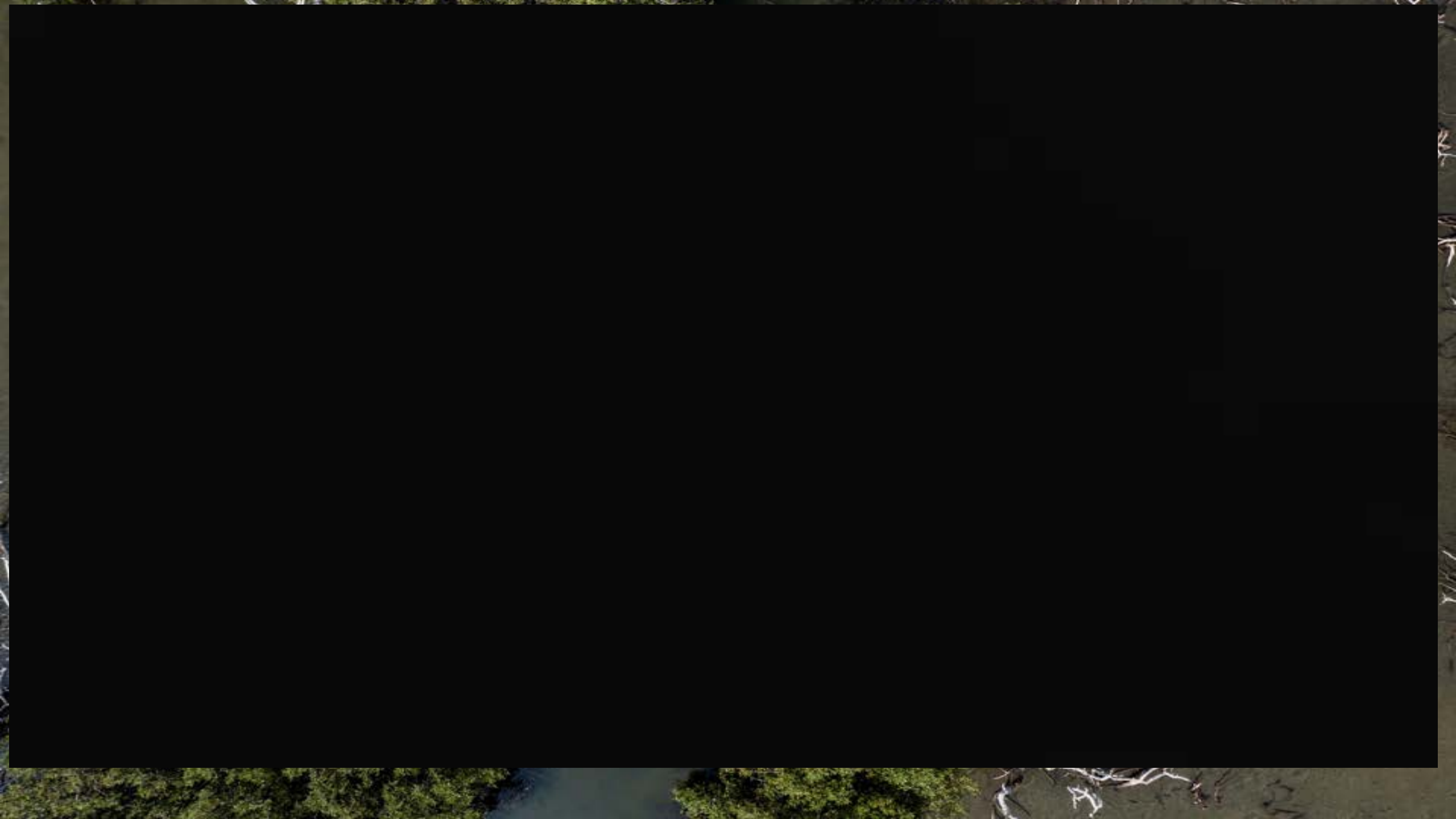
Nursery Establishment and Seedling Production

Restoration and Rehabilitation

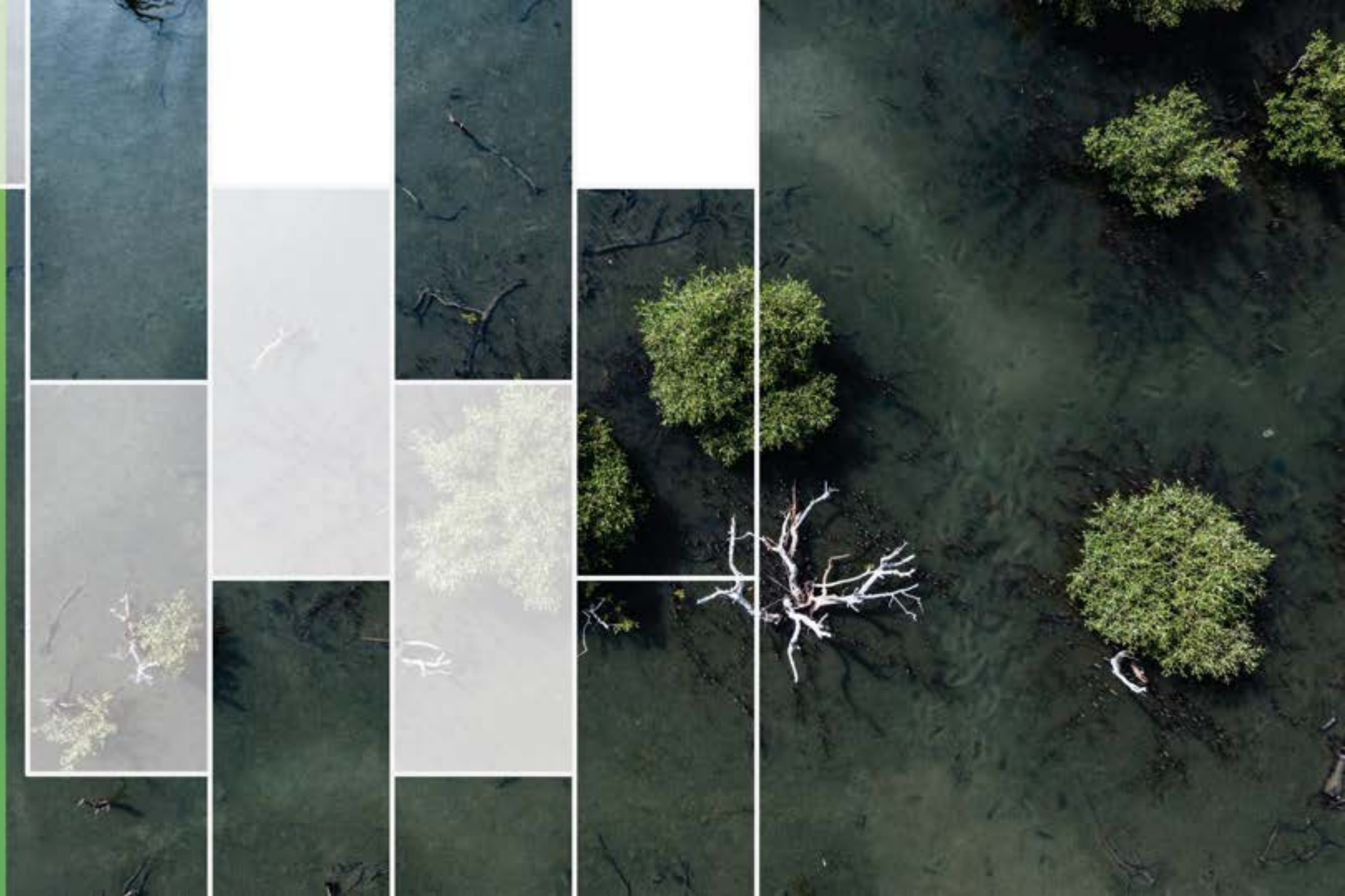
Restoration and Rehabilitation

Snapshots from World Mangrove Day 2023

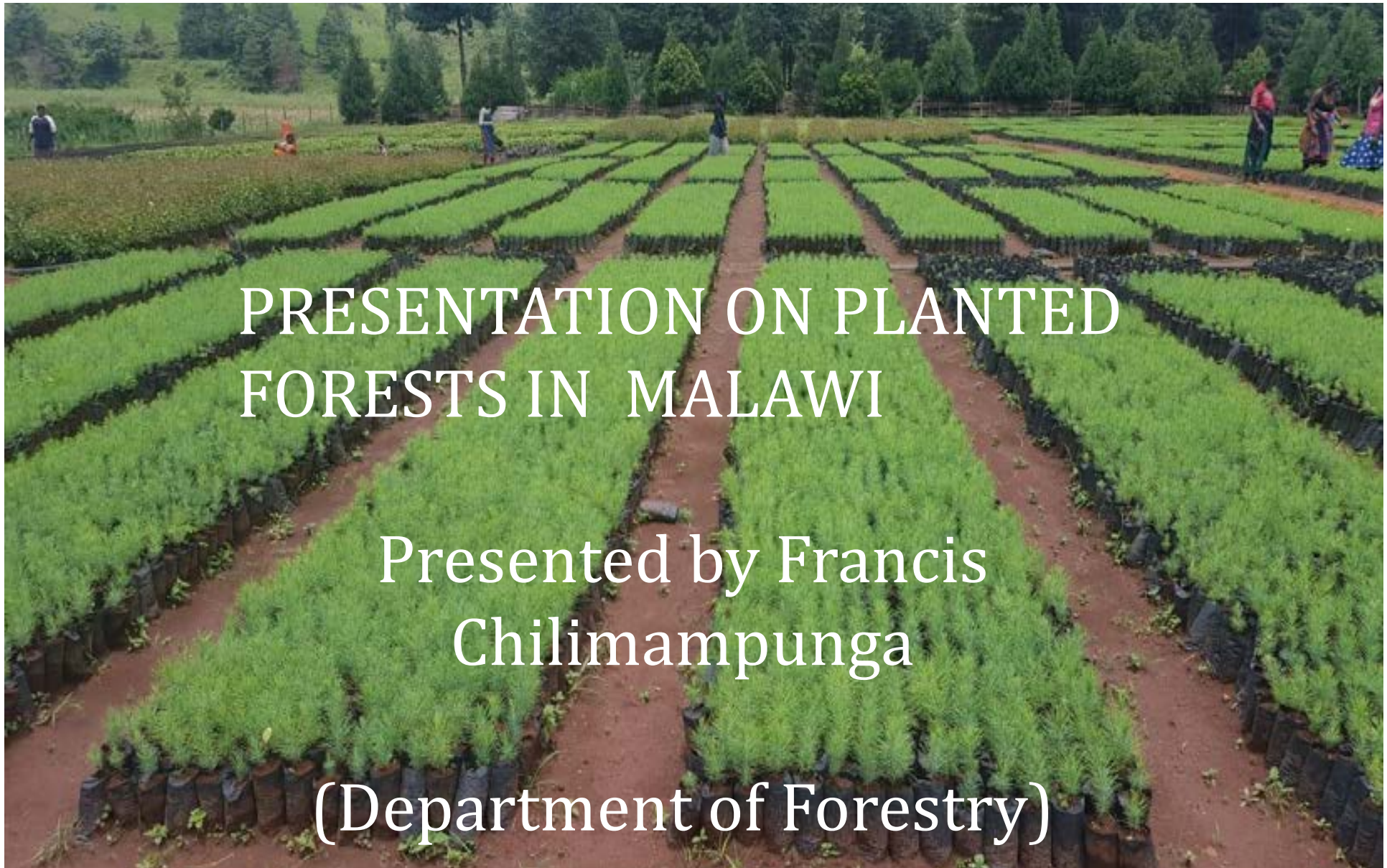
Snapshots from World Mangrove Day 2023



Thank you




the future GREEN DREAM has a major part in



PRESENTATION ON PLANTED FORESTS IN MALAWI

Presented by Francis Chilimampunga

(Department of Forestry)

1.0 INTRODUCTION

Malawi has a total area of 118,480 km² with a population of approximately 20 million

Currently forest cover is estimated at 24% of total land area and this represents both planted trees and natural regeneration management.

Deforestation rate stands at approximately 1% per annum (National Forestry Inventory, 2020)

The National Forestry Policy (2016) provides a framework for the conservation, management, protection and utilization of forest resources in the country.

Some of the overall Policy objectives are to:-

- Provide enabling framework for promoting the participation of local communities, the civil society and the private sector in forest conservation and management;
- Promote the establishment of forest based small and medium scale industries;
- Promote the growing of trees by all sectors of the communities in order to achieve sustainable self-sufficiency of wood and forest derived products and services;

2.0 TREE PLANTING IN MALAWI

- On average, 50 million trees are planted annually.
  - at least 45 million trees of both indigenous and exotic species are planted on customary and private land
  - 5 million, mostly exotic tree species are planted in state owned plantations annually.
- Local communities and other organisations e.g. Faith based and Educational organisations, are supported with inputs and advisory services to replant and manage trees within their homestead areas, boundaries and private and communal areas
- State Owned Forest Plantations in Malawi cover approximately 90,000 hectares within 21 state owned protected forests. These are dominated by planted exotic trees of *Eucalyptus* and *Pinus* trees. The largest plantation (Viphya) covers 53,000 hectares and is co-managed by both Government and the private sector.
- Out of the 90,000 hectares of state owned forest plantations, 50,780 hectares (56.4%) are managed under concessions with 16 private sector and small scale operators for concession periods ranging from 35years to 60 years.
- Tree survival rate of planted trees on average is at 75 %

3.0 MAJOR CHALLENGES

- Thefts of wood for charcoal , firewood , pole and timber production mainly for commercial purpose
- Forest fires that destroy young stands of up to 2,000 hectares of plantations per annum. On average 1,200 hectares are destroyed by forest fires in forest plantations annually
- Illegal mining and settlements
- Financing issues
- Inadequate human capacity to manage planted trees including security and provision of forestry advisory services to the general public
- Illegal opening up of gardens in protected areas:
- Inadequate tree seed supply to meet the growing demand
- Pests and diseases

Forest fires in Viphya Plantations October, 2023

4.0 INTERVENTIONS

- The National Forestry Programme, inaugurated by the Head of State annually to promote tree planting, management and conservation of forests ,
- Adopt a forest initiative
  - National Bank of Malawi adopted three forests for restoration covering 1,510Ha
  - FDH Bank adopted 304 Ha of forest on customary land for restoration
- Carbon marketing
  - Applications for carbon Marketing in forests received initially covering over 350,000 hectares
  - Guidelines for management of carbon marketing being developed
- National Forest Landscape Restoration Strategy (2017 - 2030)
  - gives strategic direction and targets for the sector linked to global initiatives e.g. Under Afri 100, restoring 4.5 million hectares forest landscape by 2030.
- National Charcoal Strategy (2017 - 2027)
  - addressing overdependence on charcoal and firewood for cooking and heating; charcoal regulations,
- Training of forestry staff at different academic levels
- Establishment of new seed stands, seed processing and storage facilities by Forestry Research Institute of Malawi (FRIM)
- FRIM undertakes its authority to monitor and control tree pests and diseases

INTERVENTIONS (Cont'd)

- Conducting silvicultural operations such as weeding, firefighting initiatives
- Forest Regulation – Forestry Act (1997) and the Forest Amendment Act (2020)
- Conducting camping and routine forest patrols and recruitment and training of armed forest guards to protect forests
- Financing through:
  - Forestry Development and Management Fund (80% of Forestry revenue collected is retained)
  - Payment for Ecosystem Services (Lilongwe Water Board and Government),
  - Programmes and Projects e.g.
    - Transforming Landscapes and Livelihoods: A cross sector approach to accelerate restoration of Malawi (GEF 7 Project),
    - Malawi Watershed Services Improvement Project (MWASIP),
    - Modern Cooking for Healthy Forests (MCHF),
    - Shire Valley Transformation Programme,
    - Alliance for Restoring Forest Ecosystems in Africa (AREECA)

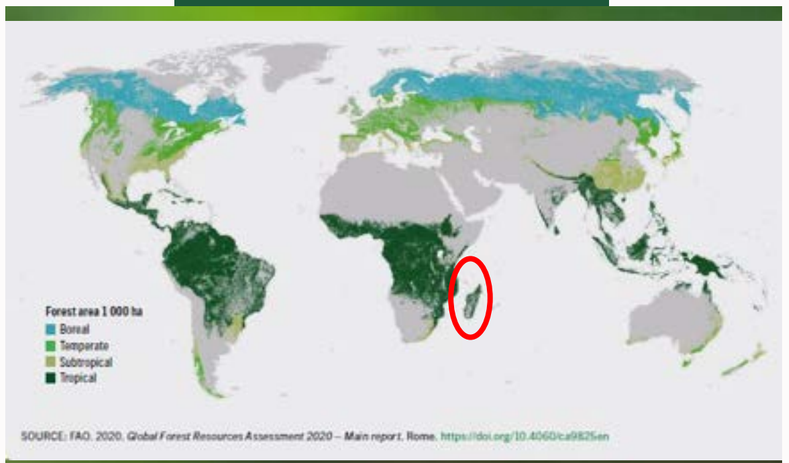
Local communities weeding newly planted trees

5.0 CONCLUSION

Successful tree planting, management, conservation and sustainable utilization can be achieved through active participation of all stakeholders. This should be backed by sound policies and political will is a must.

REPOBLIKAN'I MADAGASIKARA
Fitiavana - Tanindrazana - Fandrosoana

Ministry of Environment, and sustainable Development



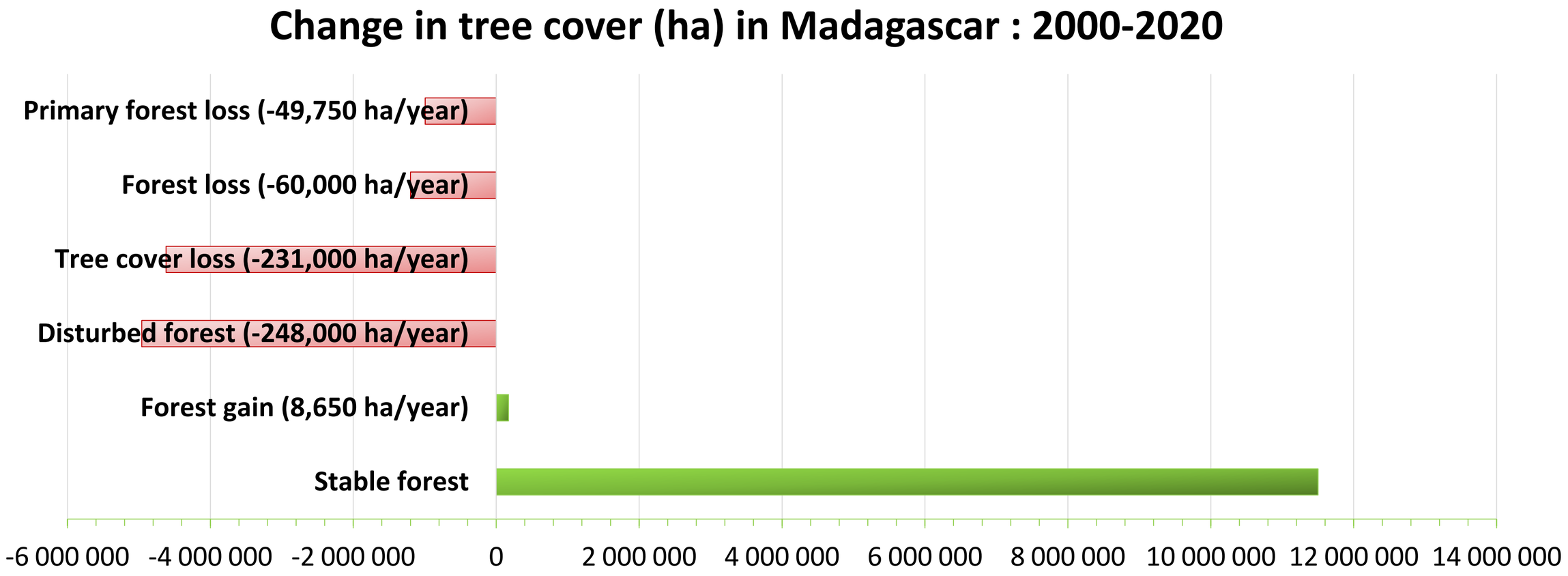
REFORESTATION IN MADAGASCAR

Presented by **Malalatiana RANDRIAMBAO**

Director of reforestation and forest landscape management

November 2023

Context



Data source: [Madagascar Deforestation Rates & Statistics | GFW (globalforestwatch.org)](), 2023

PRIMARY CAUSES OF FOREST LOSS AND DEGRADATION IN MADAGASCAR

Smallholder farming (slash-and-burn cultivation)

70% of forest loss
(land quest, local food supply)
Farmers: 80% of people

Wood supply (local wood energy, timber)

Wood demand: 18 million m3 per year including **50% from protected areas (illegally supply)**

Uncontrolled fires

Around **5 Million ha per year burned** (especially during the dry season : July-October)

RESULTS

- Worrying **land degradation** (8.75% of land area) and its fertility
- Out of phase responses with growing socio-ecosystem needs
- **Loss of biodiversity** (30% of its fauna and flora by the end of the 21st century) – home of 5% of world’s biodiversity
- Weak **economic performance** of the forest sector
- **Food insecurity** (64.9% of population)
- First country vulnerable **to climate change** in Africa
- World's first "**climate change famine**"
- **Alarming poverty** (77.4% of population)

IMPERATIVE SOLUTION

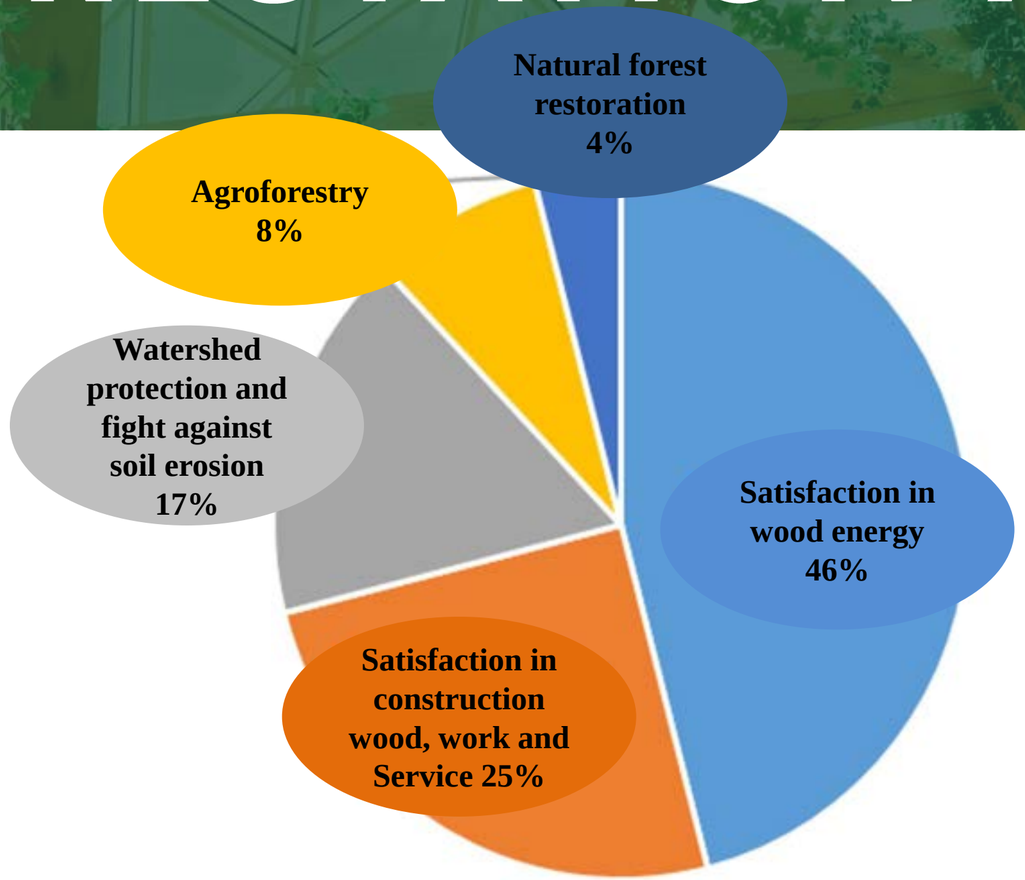
INTENSIVE REFORESTATION AND RESTORATION

(75,000 ha per year)

Reforestation national vision

- “Regreening Madagascar”
- Sustainable management and use of natural resources (sustainable wood production, biodiversity conservation, integrated management, …)
- Restoration of 4 million ha of degraded land and forests by 2030 (National FLR strategy, AFR100)
- Reduction of 14% of GHG emissions (30 MtCO2) by 2030, strengthen adaptation capacities and climate resilience (1st National Determined Contribution)

PRIORITIES FOR REFORESTATION ACTIONS



10 principles for successful reforestation in Madagascar

- Long-term commitment
- Landscape approach

- Consideration of local interests
- Strong local stakeholder empowerment

- Land security
- Well-planned planting

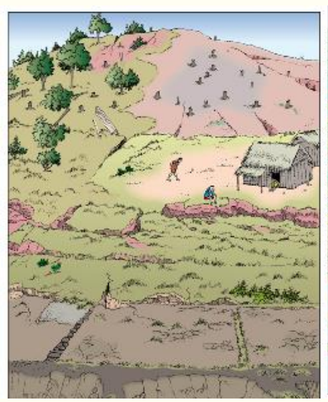
- Suitable species
- Well-trained workers

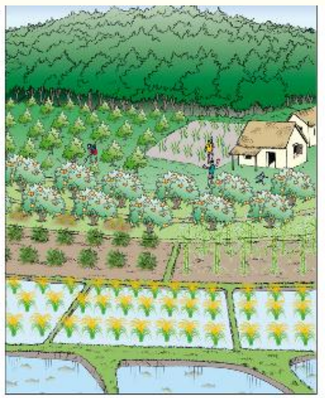
- Coordinated approach

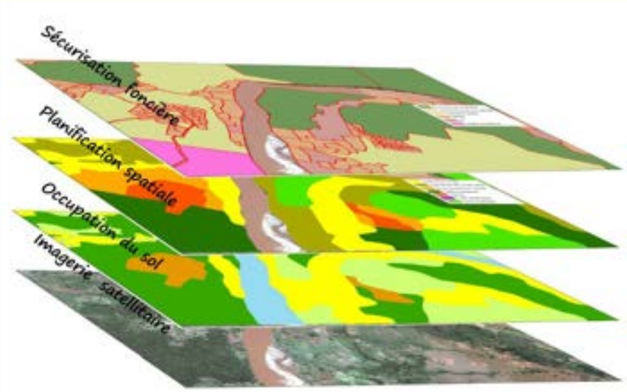
- Proper use and reinforcement of available information

Flagship best initiatives for successful reforestation in Madagascar

TOOLS







- **National roadmap (**being finalized) to **reinforce alignment and synergy between tree/forest plantation and other agricultural sectors (crop, livestock, *fishery, aquaculture) and wild* species management by mainstreaming biodiversity:** in alignment with the Kunming-Montreal Global Biodiversity Framework
- **Reforestation and restoration areas and actions planned on reference tools at different scales**
- **National directive for reforestation actions**
- **Reforestation guide according to forest type**

Flagship best initiatives for successful reforestation in Madagascar

FIELD ACTIVITIES

- **23 Big local tree nurseries (local materials valorization including waste)**
- **Useful reforestation: 3,490,481,192 tree planted in 2022 or 103,50% either 78 359,88ha of the initial objective of 75 000ha**
- **Use of introduced (Eucalyptus sp, Acacia sp, ...)and native species for reforestation (Dalbergia sp, ...)**
- **Sustainable agricultural value chains for zero deforestation**
- **Green land tittle since March 2023:** Granting of land outside protected areas for sustainable agricultural

BIG CHALLENGE

SUSTAINABLE REFORESTATION FINANCE

Need : 123,750,000 U$/year to reforest 75,000 ha/year
(1,650 U$ per hectare?) without maintenance costs
(TEEB data)

→ **Development of a sustainable financing mechanism**

- Taxation of forest products (price truth)
- Forest certification
- Payment of ecosystem services
- Loss and damage

REPOBLIKAN'I MADAGASIKARA
Fitiavana - Tanindrazana - Fandrosoana

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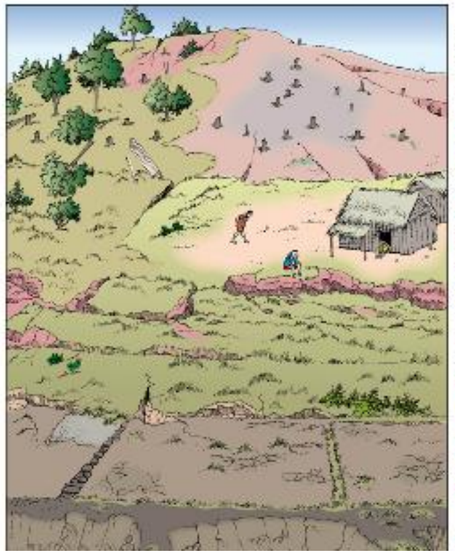
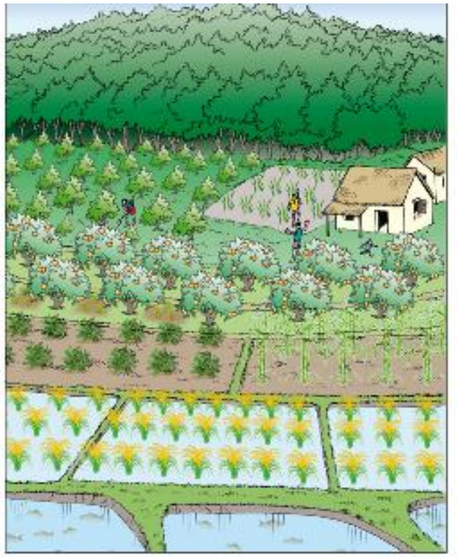




THANK YOU

Malalatiana RANDRIAMBAO

+ 261 34 05 621 43

malala27@yahoo.fr

www.environnement.mg

Antananarivo 101, Madagascar

Morphometrics of *Pinus patula* crown and its effect on cone characteristics and seed yield in Kenya

Peter Murithi Angaine, Alice Adongo Onyango and Jesse Omondi Owino

5th International Congress on Planted Forest
ICRAF Nairobi, 7-10 November 2023

Introduction

A young *Pinus patula* seed orchard

- *Pinus patula* is one of the main commercial plantation species grown in Kenya for production of sawn wood and pulp wood.
- It covers 27% of plantation forest in Kenya.
- The main sources of seeds are selected seed stands and seed orchards.
- Some studies have observed that cone production by *Pinus halepensis* and *P. sylvestris* is not uniform and often varies among compartments within the crown (A. Ayari et al., 2012; Abdelaziz Ayari & Khouja, 2014; Iwaizumi et al., 2008)

Introduction cont.

- Previous studies have focused on other pines in terms of crown variations by height. There is no literature focusing on the horizontal variability on seed production, and specificaly in *P. patula*.

- Similarly, few studies are focusing on the impacts of cone shape and effects on seed production, with no research focusing on *P. patula* cone shape and effect on seed production (Aniszewska, 2006; Guo et al., 2020; Udval & Batkhuu, 2013)

- The demand for *P. patula* seed in the country is very high (1000kg/year) whereas the supply is 600kg/year by the National Seed Center. This calls for strategies to increase the supply.

- This can be achieved by either expanding the seed sources or focusing on better collection practices.

Objectives

Main objective;

To compare the crown morphometrics of *Pinus patula* and its effects on the cone characteristics and seed yield, with **specific objectives** being;

- to determine cone characteristics in different crown compartments,
- to estimate % opening and seed yield from cones of separate crown compartments, and
- to correlate the crown compartments to cone characteristics and seed yield in order to derive the best compartment for seed collection.

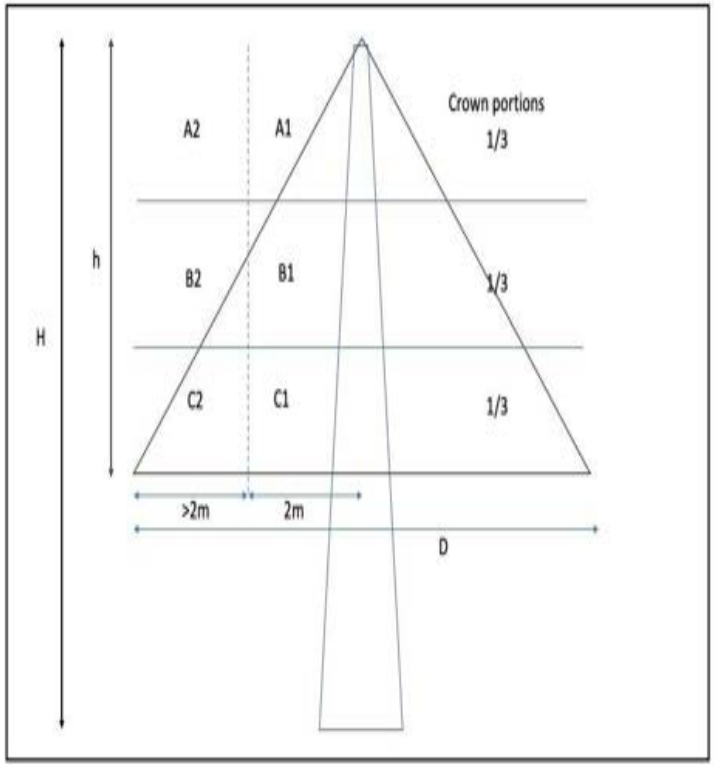
Materials and Methods

- This study was conducted in Londiani, Kenya, using *Pinus patula* cones collected from a 14-year-old clonal seed orchard in the Kamara area.

Materials and Methods

- The orchard was divided into three equal plots where 10 trees from each plot were sampled and measured for dbh and height.
- One tree that had seeded well from each of the three plots was selected and marked for cone collection.
- From these trees, measurements were taken for dbh (cm), H-height (m), h-crown height (m), and crown radius (m)

Materials and methods Cont.



- The crown was divided in 3 equal portions; top (A), middle (B), and bottom (C).
- A further subdivision was done for each of the portions into two sections based on distance from the stem. Section 1 comprised of the part that is 2m from the stem (A1, B1, and C1), section 2 comprised the part >2m from the stem (A2, B2, and C2)
- 15 mature cones were collected from each section, making a total of 90 cones per tree as a sample size.

Materials and methods Cont.

Straight and curved cones

- Cones were assessed for maturity and insect damage and those without blemish given an identity depending on the tree and crown sector from which it was collected
- 10 cones per each crown sector were selected for seed extraction.
- Before seed extraction, characteristics for each cone in terms of shape (straight or curved) length L1 cm, diameter at widest part (cm) and weight (g) was determined.
- The cones were placed on uncovered glass Petri dishes and put in a preheated (Yamato DS411) oven at temperature 65°C for 24 hours (Onyango et al., 2020).

Materials and methods Cont.

Stages of cone opening

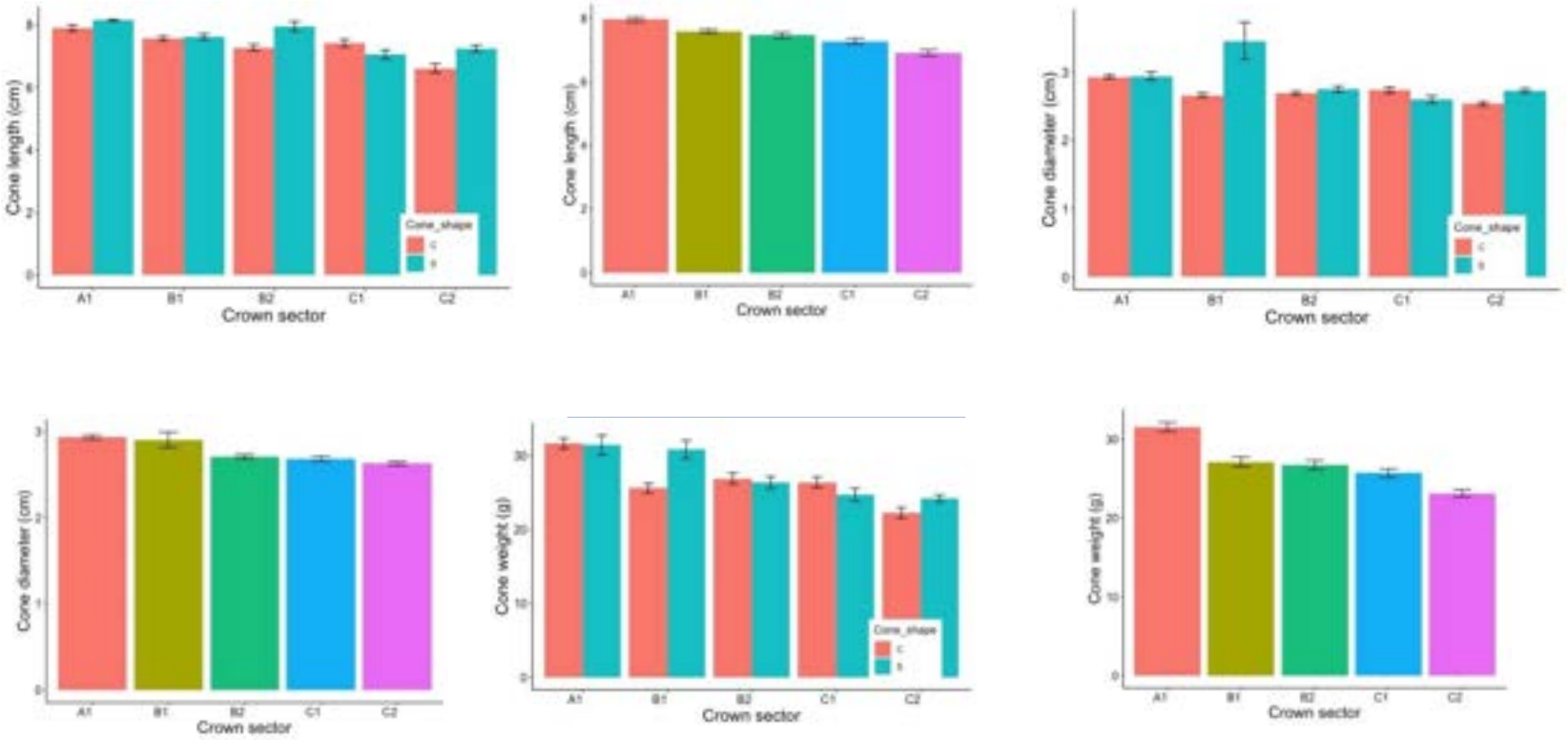
- Seeds extracted by tapping gently 15 times on a flat wooden bench and counted.
- Further measurements of length (L2) of the part of the cone that had opened (cm), the weight of the cone without seed (g), and total seed count from each cone were done
- Percentage of the cone opening

$$p = \frac{L2(cm)}{L1(cm)} * 100.$$

- Data analysis - RStudio Version 1.2.1335 was used for 2-way ANOVA & post hoc (Tukey HSD) tests.

Results

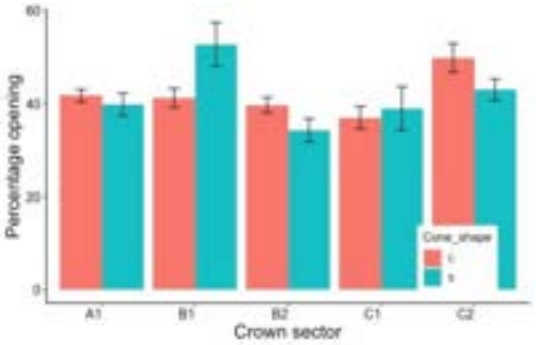
- Compartment A2 was missing in all the sampled tree crowns.
- 67.1% of the cones were curved while the rest (32.9%) were straight
- The longest and widest cones were from compartments A1 and B1 at an average length of 7.9±0.10 & 7.6±0.08 cm; and diameter of 2.90±0.03 and 2.7±0.03 cm respectively.
- Compartments A1 and B1 showed significant differences ($p<0.05$) when compared against the others (B2, C1, and C2). These findings agree with a similar study by Ayari et al., 2012 on *Pinus halepensis*, showing that the upper crown produces the longest and heaviest cones.
- The observed trend could be attributed to light exposure and space for cone development (Abdelaziz Ayari & Khouja, 2014; Iwaizumi et al., 2008)

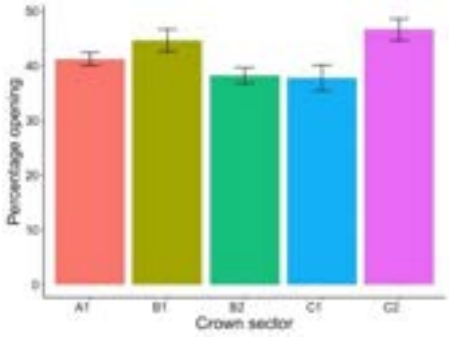


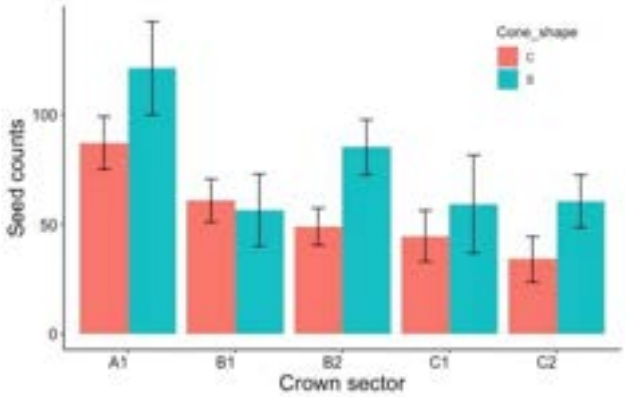
Histograms showing cone length (cm) , cone diameter (cm) and cone weight (g) by crown compartment (A1,B1,B2,C1,C2) and shape

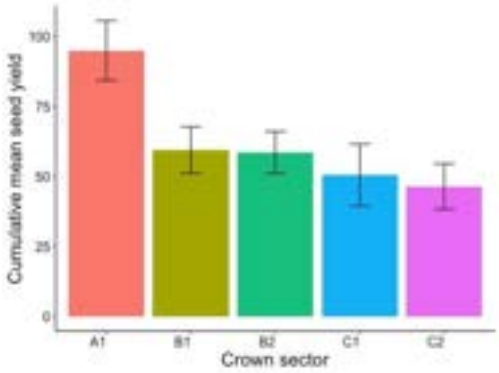
Results cont.

- Cones from compartment C2 had the highest percentage opening at 46.6±1.98%,
- Analysis of seed yield showed no significant difference ($p>0.05$) between straight and curved cones.
- Cumulative mean number of seeds was highest from cones collected from compartment A1 at 33.3±4.91 seeds, while C2 had the lowest at 14.4±2.76 seeds.


Percentage opening
Cone_shape
C
S
A1
B1
B2
C1
C2
Crown sector


Percentage opening
A1
B1
B2
C1
C2
Crown sector


Seed counts
Cone_shape
C
S
A1
B1
B2
C1
C2
Crown sector


Cumulative mean seed yield
A1
B1
B2
C1
C2
Crown sector

Conclusions and Recommendation

- The upper part of the crown (A and B) outperformed the bottom compartment (C) in seed yield.
- The study recommend cone collection from the upper and middle part of the crown.
- Further studies should focus on the influence of crown management on cone production and seed yield.

Acknowledgement

The authors are grateful for the support by the management and the staff of Kenya Forestry Research Institute during the entire process of this work

The End

Thank you for your ATTENTION!!!!

SOLIDARIDAD NETWORK

RESTORING OUR FORESTS TO ENHANCE FOOD SECURITY AND IMPROVE THE LIVELIHOODS OF SMALLHOLDER FARMERS IN EAST AND SOUTHERN AFRICA

5th International Congress on Planted Forests (ICPF2023)

Alex Amanya and Sheila Garakara

Solidaridad

SAME PROBLEM
2 APPROACHES

Reforestation (Zambia)

- Kafue River is the longest tributary of the Zambezi River, and its catchment area is entirely in Zambia.
- Lower Kafue Sub Catchment area is home to millions of crop and livestock farmers.
- Due to the pressure of the growing population, the catchment area is faced with many threats, including land and forest degradation, and therefore need to adapt to and mitigate effects of climate change.

Agroforestry (Uganda)

- Uganda produces 100 MT of tea per year, expected to grow to 150 MT in the next 10 years, tea contributes US$100 million p.a. and over 1,000,00 people derive their livelihood from the sector.
- Grown on the edges and reserves of Uganda's major tropical rain forests - Mabira, Kibale, Bugoma, Maramagambo and Bwindi forests
- The tea drying process burns 1kg of fuel wood for for every 1kg of tea made (1,200ha of an average tropical forest for 90,000T/ha of carbon stock).
- Encroachment due to tea plantation, and fuel wood consumption due to tea processing has led to the degradation of the landscapes in the tea farming communities, loss of biodiversity and drastic effects of climate change.

RESTORING LANDSCAPES IN TEA FARMING COMMUNITIES THROUGH AGROFORESTRY - UGANDA

OBJECTIVES

- To establish **2 (two) community** indigenous tree nurseries.
- To plant and integrate **100,000 tree seedlings** in the tea farming system.
- To restore **1000 ha of degraded tea landscapes** in Kyenjojo and Kabarole districts of Western Uganda.
- To enhance **carbon trade opportunities** for smallholder tea farmers.

PROGRESS

- **2 (Two) indigenous tree seedling** community nurseries have been established.
- **91,000 tree seedlings** of various species (**maesopsis eminii, prunus africana, terminalia superba,**fruit trees such as **avocado, mangoes)** for purposes of **restoration** of **biodiversity**, **climate change mitigation** and **adaptation** and **diversified nutrition** and income through **carbon trade** and sale of fruits.
- Over **1000 farmers** sensitized on agroforestry and biodiversity for improved climate resilience, food security and income.
- Business case and agroforestry design for small tea farmers submitted to **ACORN** for consideration of onboarding of farmers for **carbon trade.**

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FARMER MANAGED NATURAL REGENERATION AND TREE PLANTING - ZAMBIA

OBJECTIVES

- Establish **8 nurseries** of indigenous trees
- Plant **315,000** tree species by end of 2024
- Establish of **multistakeholder platform** to coordinate community sensitization, establishment of nurseries and plantings, and steer long term management of natural resources

PROGRESS

- **8 nurseries** established currently growing **117,800 seedlings**
- **154,000 trees planted**
- Community led **multistakeholder platform established**, with over 65,000ha of forest under sustainable land management

OUTCOMES

- Increased sustainable management of forest and woodland resources will result in increased vegetation therefore reducing local ground temperatures and soil erosion
- Increased biodiversity as a result of increased habitat availability leads to improved soils, leading to better quality crops
- Regenerated forests avail feed and fodder for livestock production
- Income from sustainably managed wood and other forest products supplements farming income

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CALL TO ACTION

- More restoration efforts are needed through **upscaling the intervention** for a much **wider impact** with **finance** from **private** and **public sectors.**
- **Climate finance** is also needed in the **Public Private Partnership model** for factories to adopt green **renewable energy** to protect the restored areas.
- **Governments** need to enact and **implement** the **necessary policies** on fuelwood use in these communities such as **establishing woodlots** for all factories for self-sufficiency to protect the restored landscapes.
- **Continuous education** and **sensitizing communities** on agroforestry for **climate resilience**.

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THAT MATTERS

www.solidaridadnetwork.org

sheila.garakara@solidaridadnetwork.org
alex.amanya@solidaridadnetwork.org

On-farm forestry: A key strategy for enhancing tree cover in the Western Region of Kenya

L. Ndalilo (PhD)

Kenya Forestry Research Institute

Presented at the 5th International Congress on planted forests, 7th -10th November 2023, CIFOR-ICRAF Campus, Nairobi Kenya.

Background

- Kenya has committed to achieve 10% tree cover by the year 2030, as part of national efforts to address climate change and enhance ecosystem restoration.
- On-farm forestry contributes significantly to Kenya's tree cover with more than half of the planted tree volume in the country found in farmlands.
- Subsequently, farmers are now managing a larger resource of planted trees than the Government, hence future efforts to increase tree and forest cover must be geared towards enhancing on-farm tree growing.
- Existing legal and policy frameworks support these efforts- The Kenya Forestry Master Plan (KFMP) puts emphasis on the contribution of on-farm forestry to both wood and non-wood products for both consumption and/or sale.
- Climate change and forestry strategic plan (2023-2027) has identified development of agroforestry and commercial forestry in private and community land as a key strategic objective.

Background….

- Tree growing has gained momentum in the Western region of Kenya due to increasing awareness on its environmental and economic benefits.
- Availability of ready market for tree products has further motivated farmers to grow trees for income generation.
- Tree growing trends however vary across the different Counties based on area specific contexts.
- Poor agroforestry practices and area specific socio-economic and socio-cultural factors hinder maximum tree productivity, despite the high potential for tree growing in the region.

Poor silvicultural practices leading to low tree productivity

Study objectives

1. To identify the socio-economic and environmental factors influencing on-farm forestry in Western Kenya.

2. To assess the impact of forestry technology dissemination techniques on uptake of on-farm forestry in Western Kenya.

3. To develop strategies for promoting on-farm forestry for enhanced environmental and livelihood benefits.

Methodology

Study sites: Vihiga and Kakamega representing Counties with high adoption of on-farm forestry; and Busia and Migori Counties representing Counties with low adoption.

Sampling procedure: Stratified sampling will be used to identify representative households to be interviewed in each County.

Data collection methods

- Semi-structured questionnaires were administered to households undertaking on-farm forestry, and those not involved.
- Key-informant interviews were conducted with forest and agriculture extension officers and representatives of various conservation-based organizations.
- FGDs were conducted with members of community and local conservation groups

Results and Discussion

Socio-economic and environmental factors influencing on-farm forestry

Social factors

- Cultural beliefs on gender roles
- Norms
- Attitudes
- Education levels- level of knowledge in tree planting, knowledge of benefit of tree planting.

Economic factors

- Land/farm sizes-land sub-division in high population areas.
- Competing land uses-inadequate land sizes against alternative land uses/economic activities
- Land tenure-lack of security of tenure hampers female participation.
- Labour requirements of tree farming vis a vis alternative land uses and economic activity.
- Poverty-poor farmers give higher priority to meeting their basic needs

Impact of forestry technology dissemination techniques on uptake of on-farm forestry

Key factors driving adoption of on-farm forestry:

- Availability of tree seeds and seedlings
- Availability of land
- Proximity to extension services
- History of past interventions
- Appropriateness of dissemination technique to the local context
- Level of education and awareness levels.

Recommended technology dissemination techniques

- Farmers field schools
- On-farm demonstration plots
- Adequate field extension
- Social media platforms

E. Grandis woodlot for round wood (roofing), fencing posts, fuel wood, transmission poles and timber

Recommended strategies for promoting on-farm forestry

- Fiscal/financial- mobilize funding from NGOs and development partners, allocation of adequate government funding to extension programmes, promoting tree farming as a business

- Institutional conditions-Empowering local organizations and enhancing strong collaboration with research organizations; establishment of a multi-partner forum for coordination and knowledge sharing.

- Political conditions-adequate policy and regulatory framework, incentive programmes, mainstreaming tree-based management systems into land management practices.

- Dissemination platforms-use of appropriate dissemination platforms, translation of existing TBS technologies into farmer-friendly messages.

Conclusion

- There is widespread adoption of on-farm forestry in Western Kenya, but the intensity of adoption varies greatly between Counties.
- The main economic factors influencing adoption of on-farm forestry in different Counties were land sizes, land uses, land tenure, and poverty, while the main social factors were cultural beliefs, norms, attitudes and literacy and awareness levels.
- Availability of planting materials, availability of land and access to adequate extension services were the leading drivers of adoption of on-farm forestry.
- The recommended technology dissemination techniques were farmers field schools, on-farm demonstration plots coupled with adequate field extension.

Recommendations

The following recommendations were made:

1. Adequate awareness creation and sensitization of the public on the environmental and economic values of tree growing for enhanced uptake.

2. Infusion of farm forestry with the national extension agenda and to include targets for scaling-up in the County Governments' performance contracts.

3. Promotion of best agroforestry practices and development of incentive frameworks for promotion of tree growing for Counties with low tree growing levels should be prioritized.

4. Ensuring strong government and nongovernmental organization (NGO) support

5. Infusing tree-based ecosystem approaches (TBEAs) into the policy and regulatory framework and national extension agenda

THANK YOU FOR LISTENING!