



TREE SEED PRODUCTION, DISTRIBUTION AND TRADE FOR COMMERCIAL SPECIES

PRESENTED AT THE COMMERCIAL CONFERENCE AND EXPO HELD ON 23-26 NOVEMBER, 2021





Background

- Majority of trees are propagated from seeds
- Seeds are critical in production of seedlings
- The success of government policies on afforestation depends heavily on the supply of sufficient quality seed to meet demand of all stakeholders.
- Production increased from about 40kg (mostly pines, eucalypts and cypress) in 1950's, 120Kg in early 1980's to about 6.000 tons in 2021 for seeds of commercial forestry and 55 tons for all species



KEFRI through KFSC is the principle producer of seeds of CTS

Kenya Forestry Seed Centre

KEFRI seed sources for major CTS

Species	No. of seed sources	Total Area (ha)
1 <i>Casuarina equisetifolia</i>	3	4.3
2 <i>Casuarina jughuniana</i>	4	7.5
3 <i>Cupressus lusitanica</i>	22	39.5
4 <i>Eucalyptus Camaldulensis</i>	9	10.7
5 <i>Eucalyptus grandis</i>	16	36.5
6 <i>Eucalyptus urophylla</i>	6	6
7 <i>Grevillea robusta</i>	11	23.5
8 <i>Melia Volkensii</i>	3	23
9 <i>Pinus patula</i>	16	62.5
Total	89	213.5

Seed Production Process

Seed Collection



Seed Stand



Seed Extraction and processing



Seed testing



Seed Packaging



Distribution



Trend in seed production for major CTS

Species	20/21	5 years Total kg	5 years Estimated seedlings
<i>C. equisetifolia</i>	292	351	100,035,000
<i>C. junghuhniana</i>	97	200	99,750,000
<i>C. lusitanica</i>	237	1,408	53,504,000
<i>E. camaldulensis</i>	98	558	167,400,000
<i>E. grandis</i>	491	771	231,300,000
<i>E. urophylla</i>	40	95	28,500,000
<i>G. robusta</i>	203	203	7,005,530
<i>M. volkensii</i>	1,363	1,576	1,950,300
<i>P. patula</i>	501	971	83,942,950
Total kg	3,322	6,133	773,387,780



Strategies to increase quality tree seed production and use

- Intensify genetic improvement of indigenous and exotic tree species
- Identify and register private seed sources
- Train owners of private sources and register them as suppliers
- Quality assurance through certification



**MELIA VOLKENSII (MUKAU) SEED
ORCHARD (GERMPLASM COLLECTION)**

TECHNICAL COOPERATION PROJECT

BETWEEN

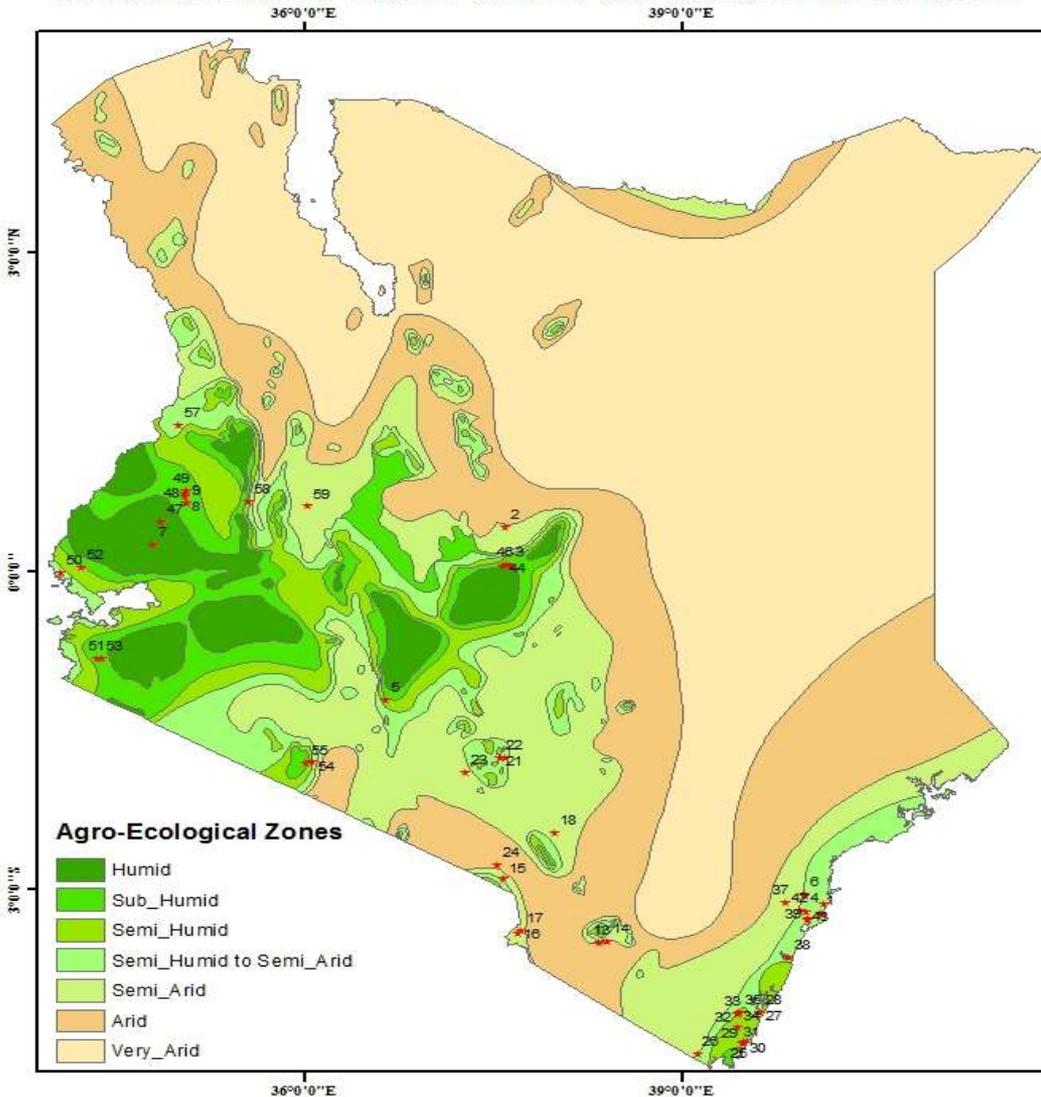
**KENYA FORESTRY RESEARCH INSTITUTE &
JAPAN INTERNATIONAL COOPERATION AGENCY**





Digitization and publication of registered seed sources

REGISTERED TREE SEED SOURCES IN KENYA



Seed Species

- * 1, *Casuarina equisetifolia*
- * 2, *Acacia tortilis*
- * 3, *Prunus africana*
- * 4, *Azelia quanzensis*
- * 5, *Cupressus lusitanica*
- * 6, *Brachystegia spiciformis*
- * 7, *Markhamia lutea*
- * 8, *Eucalyptus grandis* ex. S. Africa
- * 9, *Eucalyptus grandis* ex. S. Africa
- * 10, *Grevillea robusta*
- * 11, *Eucalyptus grandis*
- * 12, *Pinus tecuminii*
- * 13, *Lannea schumanii*
- * 14, *Melia volkensii*
- * 15, *Acacia xanthophloea*
- * 16, *Chlorophora excelsa*
- * 17, *Faidherbia albida*
- * 18, *Azadirachta indica*
- * 19, *Acacia elitior*
- * 20, *Acacia polycantha*
- * 21, *Acacia seyal*
- * 22, *Acacia gerrardii*
- * 23, *Acacia mellifera*
- * 24, *Acacia tortilis*
- * 25, *Azadirachta indica*
- * 26, *Azadirachta indica*
- * 27, *Casuarina equisetifolia*
- * 28, *Azadirachta indica*
- * 29, *Tectona grandis*
- * 30, *Leucaena leucocephala*
- * 31, *Paramacrobum coeruleum*
- * 32, *Milicia excelsa*
- * 33, *Azelia quanzensis*
- * 34, *Erythrophloeum suaveolens*
- * 35, *Senna siamea*
- * 36, *Casuarina equisetifolia*
- * 37, *Azadirachta indica*
- * 38, *Azadirachta indica*
- * 39, *Eucalyptus urophylla*
- * 40, *Azadirachta indica*
- * 41, *Gmelina arborea*
- * 42, *Brachylaena huillensis*
- * 43, *Azadirachta indica*
- * 44, *Vitex keniesis*
- * 46, *Vitex keniesis*
- * 47, *Khaya anthotheca*
- * 48, *Eucalyptus grandis* (ex. S.A & Ex. Zim)
- * 49, *Grevillea robusta*
- * 50, *Eucalyptus camaldulensis*
- * 51, *Glicicidia sepium*
- * 52, *Albizia coriaria*
- * 53, *Acacia magium*
- * 54, *Cordia sinensis*
- * 55, *Jatropha curcas*
- * 57, *Tamarindus indica*
- * 58, *Azadirachta indica*
- * 59, *Acacia tortilis*

125 62.5 0 125 250 375 Km



Kenya Forest Research Institute



Scale 1:5,309,733

Produced by Sheila Wachiye

The Kenyan Tree Seed Market For Commercial Species

In Kenya, demand for tree seeds of commercial species has historically been largely driven by the government's afforestation and reforestation programs

More recently, entrepreneurs are increasingly targeting seeds of commercial tree species

Programs targeting livelihood improvements are also targeting seeds of commercial tree species to grow trees for economic empowerment

Seed marketing in Kenya is regulated under seeds and plant varieties Act, Cap 326 that guides the distribution and exchange of seeds.

LEGAL NOTICE NO.....

**SEEDS AND PLANT VARIETIES ACT
(Cap. 326)**

**THE SEEDS AND PLANT VARIETIES (FOREST
TREE SEEDS) REGULATIONS, 2021**

What is the status?



Proposed Forest Tree Seed Certification Unit at KEFRI

- *Unit with autonomous regulatory powers to:*
 1. Develop technologies to backstop tree seed certification and use,
 2. Register forest tree seed merchants and sources,
 3. License forest tree seed merchants and stockists,
 4. Ensure appropriate application of seed processing and storage protocols

- Test in accordance to the best practice protocols all trees seed lots meant for commercial purposes
- Seize and dispose of any tree seeds that do not conform to the quality standards
- Maintain and publish a list of certified forest tree seed lots and sources.

Documentation and traceability of certified seeds

To ensure that marketed seed lots conform to the required standards and are traceable to the registered source throughout the whole chain from production to end use.



VISION 2030, Increase forest cover to 10%

Registered Seed Source

Seed Source registration / code	KEFRI/122/3/1
Species	<i>Casuarina equisetifolia</i>
Common/ name	Casuarina, Whistling pine
Age of seed source if planted or average for naturally growing trees	40 years
County	Kilifi
Locality	Behind Malindi Airport
Age (years) at selection time	40 years
Number of trees in source	100
Recommended treatments	Select seed mother trees (>30)
Delineated area of source	20 acres around farm boundary
Expected annual production (kg)	50 kg
Name and address of owner	Mr. Bawali Farm, Malindi
Names of source selectors	Muthini J., Angaine P., and Omondi W.
Date of source selection	22/08/2011
Date of approval	

Recommended minimum quality standards for major CFS

Species	Purity	MC	Germ
<i>Casuarina equisetifolia</i>	90	8	40
<i>Cupressus lusitanica</i>	95	8	65
<i>Eucalyptus camaldulensis</i>	90	8	75
<i>Eucalyptus grandis</i>	90	8	75
<i>Eucalyptus saligna</i>	90	8	75
<i>Eucalyptus urophylla</i>	90	8	75
<i>Grevillea robusta</i>	90	8	75
<i>Pinus patula</i>	98	9	75
<i>Vitex keniensis</i>	99	8	50

Strategies to improve access seedlings on farms

- Build capacity of community groups and other stakeholders in seed production,
- Strong network of seed distribution points (e.g. stockists and county offices),
- Framework e.g. legislation in which other stakeholders can participate in tree seed production

CAPACITY BUILDING IN TREE SEED COLLECTION AND HANDLING

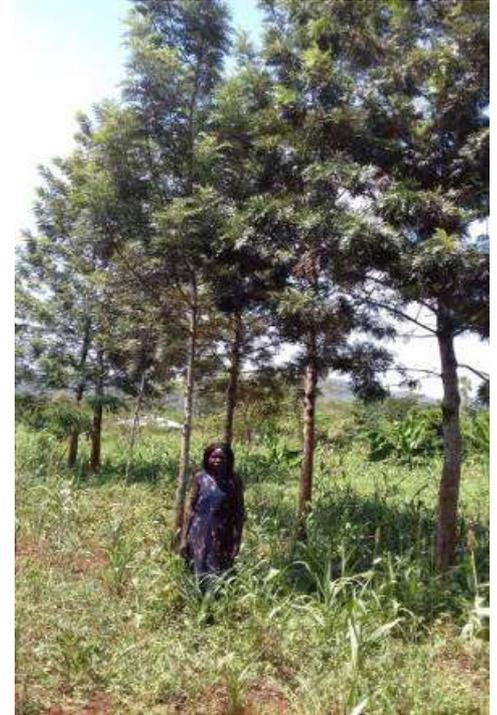


**REFERENCE MANUAL FOR EXTENSION AGENTS AND
FARMERS**

Key to successful tree seed handling

Empowering local communities to collect, propagate, produce seedlings and plant trees of preferred species





Training in tree nursery establishment and management

Challenges in production of seeds for CTS

- Tree improvement for improved seed sources require investment in resources including time
- Loss of seed sources
- Changes in phenology (flowering and maturity)
- Resourcing for seed collection, processing, storage and certification
- Unregulated tree seed vendors (counterfeits)

Challenges in production of seeds for CTS

- Unavailability of improved seed sources
- Low funding for seed production & distribution
- Climate change
- Forest Fires,
- Pests and diseases,
- Floods and wildlife damage to seed sources
- Unregulated tree seed vendors
- Illegal felling of trees in seed sources

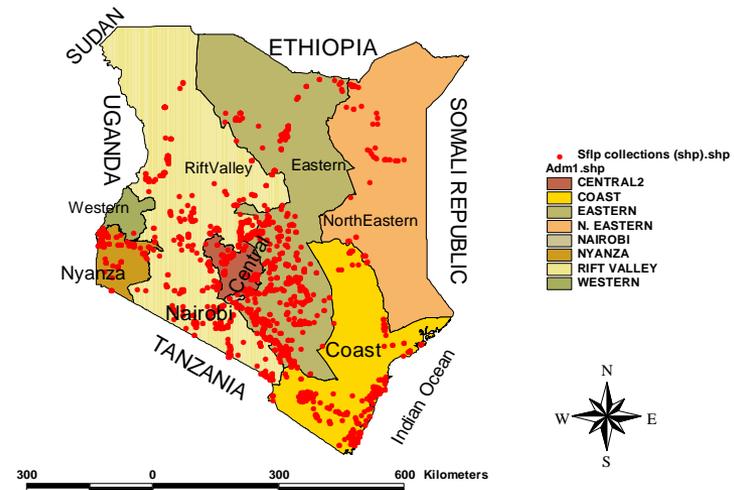
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- **Climate change related impacts**
 - Changes in phenology: frequency and timings
 - Productivity: seed yields and pollinators
 - Quality: Seed health and size
 - Physiology: germination behavior and dormancy

Ex-situ conservation

Collected, documented and stored seeds of tree and shrubs representing

- 120 families
- 359 genera and
- 554 species indigenous to various regions of Kenya.

Seed for life project showing distribution of locality points in Kenya



*In quality tree seed we
secure the future of our
children - Thanks for your
attention*

