Effective Tree Seed Systems

Flagship 1: Tree genetic resources to bridge production gaps and promote resilience
THE RIGHT TREE FOR THE RIGHT PLACE FOR THE RIGHT PURPOSE

- Safeguarding Diversity: how best to conserve high value tree species (fast disappearing diversity)
- Breeding/Improvement: how best to develop quality germplasm
- Seed Delivery Systems: How to mobilize integrated seed and seedlings systems
- Returns on Investments: integrated approach to quality seed production and use
Soaring global ambitions and large scale initiatives to plant trees

• Bonn Challenge, AFR 100, 20 x 20, 1t.org, Trillion Trees and plethora of groups/bodies supporting tree planting.
• Hundreds of millions of hectares pledged by governments, corporates and civil society for tree-planting, reforestation, much for carbon.
• The UN Decade on Ecosystem Restoration 2021 to 2030
• At COP26 100 leaders promise to end and reverse deforestation by 2030
Concern: massive scale and speed

- Lack of seeds for diverse species - quick way out - exotic species promoted - low diversity monocultures favoured over diverse portfolios
- Poorly designed projects
- Tree-planting platforms with limited skill and knowledge (especially tree genetics)
- Southern governments ill equipped to drive tree diversity agenda
- National seed centres in collapse
- Global and national decline in knowledge of botany and taxonomy
- Donors/Investors are generalists, do not ask “pointed” question
Provision of adequate tree seed portfolios in Ethiopia (PATSPO)

NICFI funded ‘model tree seed systems’

Improving the availability of quality tree seed

https://www.worldagroforestry.org/project/provision-adequate-tree-seed-portfolio-ethiopia

Availability of profitable climate appropriate portfolios of tree diversity are being built in support of one of the globally largest national restoration programmes using an integrated approach to conservation, breeding and delivery supported by the CIFOR-ICRAF Genebank

Can be implemented everywhere

Based on half a century of experience and evidence from both tropical and temperate regions
Loss and gain – huge benefits at low cost

Societal and planetary benefits can be huge
Applied on the plans for Ethiopia over 30 years:

- **Net Present Value** will increase by USD 11 billion
- **Soil conservation** of 160 million t of soil per year
- **Carbon sequestration** of 178 million t CO₂-e per year
- Reaching 4 million rural households

Benefits after processing (sawing, transporting, nutrition and health), on employment generation and on biodiversity not included

Germplasm Quality impacts Tree performance

- **Suboptimal germplasm**
  - Low potential
  - Vulnerable to stress
  - Poor quality
  - Yield gap down to -50%

- **Best current germplasm**
  - High potential
  - Tolerant to stress
  - High quality
  - Yield gain up to +30%

- **Improved germplasm**
Broken value-chain
Why does it not happen?

- Long life cycle of trees
- Insufficient knowledge
- Insufficient awareness
- Lack of investments
Global Tree Knowledge Platform:
https://www.worldagroforestry.org/tree-knowledge
(all links from there – not repeated here)

Tree Databases
includes the Agroforestry Database which explores the uses and ecologies of over 600 tree species used in agroforestry systems globally and has been accessed > 300,000 times.

Apps and Maps
includes interactive maps such as the vegetationmap4Africa that helps development practitioners, growers and scientists to understand what tree species grow where in the region. Documentation has been downloaded > 40,000 times.

Guidelines
These include the Tree Domestication Primer and Good Tree Nursery Practices which guide scientists and practitioners. Downloaded > 50,000 times.

Analysis packages
These include BiodiversityR and vegan which provide a range of methods for ecologists to statistically analyze tree species diversity data. Together, these have been installed by users > 2,600,000 times.

CIFOR
World
Agroforestry

https://www.worldagroforestry.org/tree-knowledge
Guidelines

Tree Seeds for Farmers
Mama Wangari Maathai at CIFOR-ICRAF seed lab

The Resources for Tree Planting Platform
https://www.worldagroforestry.org/output/resources-tree-planting-platform

Agroforestry Database
Agroforestry Species Switchboard
Tree Functional Attributes and Ecological Database
Priority Food Tree and Crop Food Composition Database

These include the Agroforestry Database, which explores the uses and ecologies of over 600 tree species used in agroforestry systems globally. It has been accessed > 300,000 times.
Offers for business and development corporation for any larger planting programme

Quality tree germplasm and effective tree planting/growing actions:

• Mobilize prioritized species collections, conserve, develop and deliver on the global public good of the CIFOR-ICRAF Tree Genebank

• Build national capacity and infrastructure

• For deployment, establish diversity breeding programmes - breeding seed orchards & multiplication gardens, optimized nursery operations

• Research outcomes in open access decision support tools and information platforms

• Establish a partnership platform to scale up tropical tree conservation and quality planting

• Innovative business approaches to sustainably establish, fund and monitor community tree conservation and use
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QUALITY SEEDS have ‘PLANETARY AND SOCIETAL’ benefits
It’s absolutely WICKED and CRIMINAL not using good seed

• There is science behind use of integrated seed systems so if you are involved in any kind of tree planting talk to the experts in the field; work at the project design stage of tree planting initiatives

• 30% of tree species are threatened – conservation *ex situ*, *in situ* and *circa situ* is an urgent priority

• Public and private investors in tree planting: Integrated tree seed systems have been neglected long enough so require long term investment investments urgently

• Scientists – reach out and scale out existing experience and knowledge to support the burgeoning forest landscape restoration and broader tree planting initiatives.
A MIGHTY TREE STARTS FROM A SEED
Integrated Tree Seed System EXPERTS of FTA- Flagship 1

Lars Graudal, Jens-Peter B Lillesø, Ian K Dawson, Abrham Abiyu, James M Roshetko, Isaac Nyoka, Alain Tsobeng, Roeland Kindt, Fabio Pedercini, Soren Moestrup, Riina Jalonen, Evert Thomas, Stephania McMullin, Sammy Carsan, Prasad Hendre, Chris J Kettle, Li Yanxia, Ramni Jamnadass

Thank you so very much for all your excellent work
Hope to work with you again and soon in FTA PHASE 3 perhaps?