

Country Experiences on Gene Bank Development and International Collaboration

The Case of the National Forest Seed Centre of Burkina Faso

June 2020
Dr Moussa OUEDRAOGO



Plan

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2. Présentation of CNSF
 - a . Missions/ specifics objectives
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1. Introduction / context of the creation of the Centre National de Semences Forestières (National Forest Seed Centre)

Burkina Faso is part of the so called sahel region which is characterized by **frequent droughts where two-thirds** of sahelian Africa's people **live in rural areas** and rely on agriculture and other natural resources for income. Therefore, the country is facing the combined effects of natural and anthropogenic factors which are increasing pressures on the natural resources.

About 90% of the working population are employed in agriculture and animal husbandry (MEF, 2010).



1. Introduction / context of the creation of the Centre National de Semences Forestières (National Forest Seed Centre)

The Agroforestry **system** (integrated crop-tree-livestock systems), which is the predominant land use system in the Sahel, is the **main provider of food, income, and environmental services.**

Therefore, in the sahel, agroforestry is revealed to be uniquely suited to address the requirement for increased food security and biomass resources, and the need to sustainably manage agricultural landscapes for the critical ecosystem services they provide (ICRAF, 2009),



1. Introduction / context of the creation of the Centre National de Semences Forestières (National Forest Seed Centre)

However, indigenous **trees** such as *Vitellaria paradoxa*, *Tamarindus indica*, *Adansonia digitata* and *Parkia biglobosa* that previously have been maintained for food and other values in agroforestry Parklands systems **are shrinking** which **compromise the availability of important resources for rural people.**

This is due mainly to **demographic pressure** and **climate variability** characterized by drought that is occurring with increasing frequency and intensity in the sahel region



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To fight against the great drought that has experienced the whole region of the sahel in the 1970's, it became a popular notion to stop desertification by supporting tree planting across the Sub-Saharan belt from Senegal in the west to Somalia in the East (the Sahelian and North Sudanian Zones of Africa).

A critical issue is often to match the purpose of planting or regeneration with choice of species and the prevailing site conditions. To overcome this problem, a **regional effort to improve supply of tree seed was** made in the 1990ies with wide support from institutions like CILSS, FAO, UNSO, the World Bank, IUFRO, national governments and several bilateral donors).



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The initiative was successful in the sense that national tree seed programmes were established with public support in many of the countries in the region (Burkina Faso, Ethiopia, Eritrea, Kenya, Niger, Uganda, Senegal, Sudan, Tanzania).

It is in this context that the National Forest Seed Center (CNSF) was created in 1983 in Burkina Faso





Centre National de Semences Forestières

Seed for tree, tree for life!

Created in **1983** as a governmental project, CNSF was erected as an autonomous public administration in **1997** and then as a Research and Development institute in **2015**, giving it a management autonomy

MISSION

is to contribute to combat desertification and climate change mitigation

4 SPECIFICS OBJECTIVES

Support of reforestation programmes by producing and delivering high quality seeds/seedlings in sufficient quantity for current and future climates

Contribute to the national scientific research and development plan with other research institutions

Contribute to the conservation of biodiversity by the development of *ex-situ* and *in-situ* conservation

Contribute to the self-development of farmers





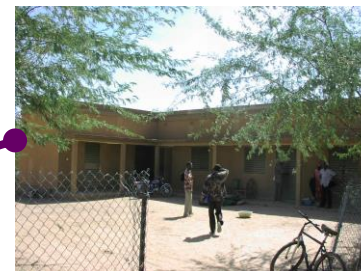
Centre National de Semences Forestières

La graine pour l'arbre, l'arbre pour la vie!

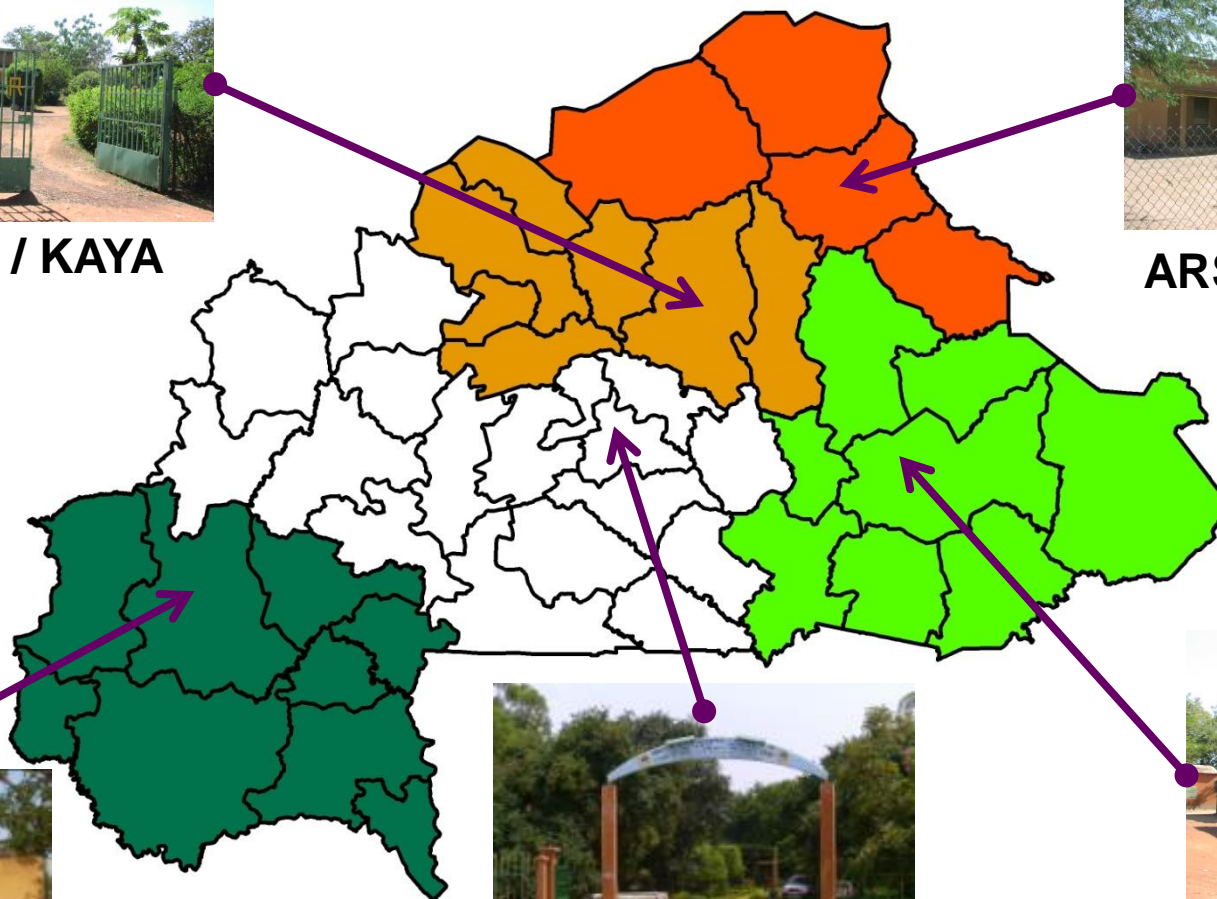
Décentralization: **4 Regional Forest Seed Antenna in 4 ecological zones of the country**



ARSF / KAYA



ARSF / DORI



SIEGE CNSF/
OUAGADOUGOU



ARSF / FADA



ARSF / BOBO



Centre National de Semences Forestières

Seed for tree, tree for life!

Organization: **2 technical Directions**

Seed and plant Production/ delivery and training extension Direction

- ✓ Seed and plant Production/Delivery Department ;
- ✓ Training and marketing Department;

Applied Research Direction

- ✓ Tree breeding and Forest Genetic resources Conservation Department
- ✓ Ecology, Taxonomy and Sylviculture, Department
- ✓ Seed Technology Department Semences
- ✓ Seed and plant pathology Department



MAIN ACHIEVEMENTS

1. Land Restoration through quality seed and plant promotion

- *Mobilization of around 150 tonnes of 300 local and exotic, woody and herbaceous species*
- *Delivery of around 100 tonnes of seed at national level, in the sahel region and at international level (tropical regions in Asia and America)*
- *Production and distribution of around 7,000,000 quality plants on demand to meet the specific needs of producers and to support reforestation*

operations



MAIN ACHIEVEMENTS

2. Forest Genetic resources Conservation

- More than 500 seed stands identified and localized in 6 provenances région in the country
- Participatory management of seed stands in collaboration with local people

Conservatoires *in-situ*

- Conservatory plantations of endangered species such as

➤ *Acacia nilotica var. tomentosa*, *Pterocarpus lucens* ...

- **Seed orchards of important local species:**

Parkia biglobosa, *Faidherbia albida*, *Khaya senegalensis*, *Acacia senegal*, *Pterocarpus lucens*...





MAIN ACHIEVEMENTS

Seed for tree, tree for life!

2. Forest Genetic resources Conservation

ex-situ Conservatories



ventilated and air-conditioned rooms
(15-20 °C)



Cold rooms (4-5 °C)

Storing capacity of rooms = 10 tons of seed



MAIN ACHIEVEMENTS

Seed for tree, tree for life!

2. Forest Genetic resources Conservation

Herbarium activities

Collections: 12 500

- Genera: 824

- Species: 1250

- Families: 123

Average 60% of the species
of local flora currently listed

2008: registration at the
Index Herbarium





PRINCIPAUX ACQUIS

Seed for tree, tree for life!

3. Genetic improvement of plant material

- About 200 ha of provenances/progeny trials of 25 species
- **Objective** : In the mean term increase the production of improve seed



Provenances trial of *Parkia biglobosa*, at Gonse, Burkina Faso



PRINCIPAUX ACQUIS

Seed for tree, tree for life!

3. Genetic improvement of plant material

- **Development of grafting technics for indigenous species** (karité, néré, baobab, kapokier, gum tree ...)
- But: ***reduce the tree reproduction cycle***
- ***tool for tree selection***

Grafted local shea tree
(*Vitelaria paradoxa*,
flowering at young age)





PRINCIPAUX ACQUIS

Seed for tree, tree for life!

3. Genetic improvement of plant material



Grafted Shea tree seed orchards



MAIN ACHIEVEMENTS

3. Genetic improvement of plant material

Gum tree (*Acacia senegal*) improvement programme



- Sélection of superior trees in natural stands
- Vegetative propagation of the superior trees
- Establishment of clonal seed orchards



Centre National de Semences Forestières

Seed for tree, tree for life!

MAIN ACHIEVEMENTS

4. Knowledge transfer

- ✓ Supervision of around thirty trainees / year (Universities, Vocational schools)
- ✓ Establishment of a documentation center dedicated to forest seeds and forest genetic resources: 4000 documents recorded





Centre National de Semences Forestières

Seed for tree, tree for life!

MAIN ACHIEVEMENTS

4. Knowledge transfer



Environmental Education for young schoolchildren



Centre National de Semences Forestières

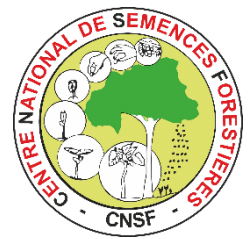
Seed for tree, tree for life!

MAIN ACHIEVEMENTS

4. Knowledge transfer

Training sessions in shea grafting for the benefit of women and adult producers





Centre National de Semences Forestières

National Forest Seed Centre

Seed for tree, tree for life!



Many partnership concerning research program on **tropical forestry** and **biodiversity** area as well at national as at international



FOREST & LANDSCAPE



3. CNSF and Gene banks Development and International collaboration

Contribution of CNSF to the gene banks development

- The recent decade there has been a diminishing priority of sustainable forest management in the national policies of some countries, **a widespread loss of competence in taxonomy, and an erosion** of many applied programmes of genetic resource management.
- Such widespread loss of practical knowledge and ability in tree species identification, tree seed handling, tree breeding and tree genetic resource conservation management **will be an impediment for programmes to conserve and use tree genetic diversity in support** of any development programme



3. CNSF and Gene banks Development and International collaboration

Contribution of CNSF to the gene banks development

- Several regional workshop trainings organized by CNSF on diverse thematics:
 - ✓ Seed handling and technology,
 - ✓ Forest genetic conservation
 - ✓ Forest genetic data analyses
- Welcome of around 30 students (MsC and doctoral level) yearly
- Involved in several research and Development projects at regional Level with international and Regional partner;
- CNSF is Member of OECD forest seed and plant scheme;



3. CNSF and Gene banks Development and International collaboration

Contribution of CNSF to the gene banks development

- Main contributor for the elaboration and the execution of the regional forest seed project in the 1990's sponsored by CILSS and its partners
- Has contribute through technical support to the creation and Development of seed centres in the region (Mali and Niger) in collaboration With the Millenium Seed bank project / Kew, Great Britain



3. CNSF and Gene banks Development and International collaboration

Contribution of CNSF to the gene banks development

- Member of the sub-Saharan African Forest Genetic Resources (SAFORGEN) support by Bioversity International Which bring together several research/ Development institutes of the region



3. CNSF and Gene banks Development and International collaboration

Conclusion and perspectives

- Forest seed centres are an important tool **for Forest Genetic Conservation And a mean to unlocking trees genetic potential for food and nutritional security of people**. This is particularly the case of the national forest seed centre (CNSF) of Burkina Faso Which is the lead in promoting the sustainable use of indigenous tree/ herbaceous species In the sahelian through :
 - Their **sylviculture mastering**
 - making **available seed/plants** for agroforestry activities
 - The **promotion of the sustainable use of local species potentials** (food, medecine, forage, environmental Services ...)



3. CNSF and Gene banks Development and International collaboration

Conclusion and perspectives

In Perspectives

There is a need to:

- to develop a regional Programme to support The development/strengthening of forest seed centres
- Encourage the creation and the development of forest seed Centre network which will be a tremplin to support training and seed management activities





Tank you for your attention