

Botanic Gardens Conservation International
The world's largest plant conservation network



BGCI

Plants for the Planet

Module 2: Species selection for forest restoration



Aims of the module

To have a greater understanding of:

- The value of biodiverse forest restoration i.e. restoration that incorporates a wide variety of native species.
- The resources available to support the species selection process
- How botanic gardens can provide assistance to your forest restoration project
- The different ecological restoration approaches which can be utilised

Why native species?



BGCI

Plants for the Planet

There are many benefits to planting native trees including:



Naturally adapted



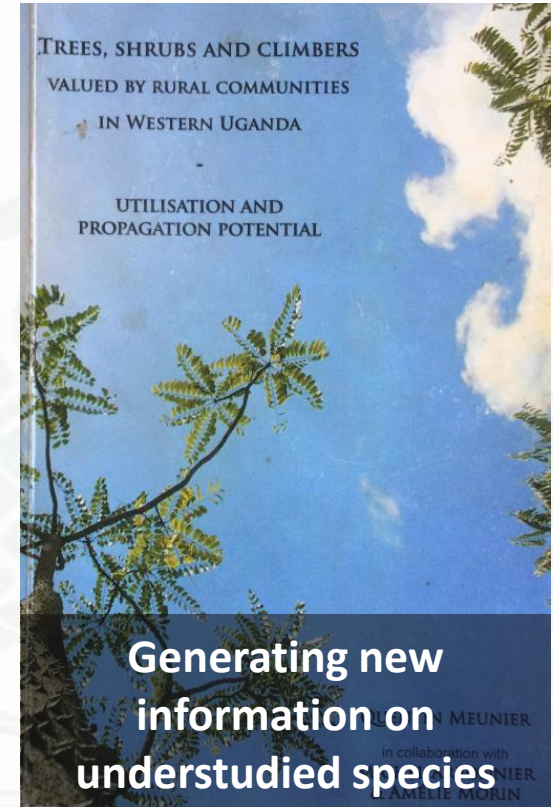
Less likely to be invasive



Biodiversity conservation



Medicinal & cultural values



Generating new information on understudied species

What is a resilient forest?



BGCI

Plants for the Planet

Resilience – “The capacity to recover quickly from difficulties” / “The ability to spring back into shape”

Increasing forest resilience



High species diversity

- Plant a wide mix of indigenous species
- Don't plant species in patches



High genetic diversity

- Collect wild material from as many sources as possible
- Collect seed instead of cuttings

How do you know which tree species are native?



BGCI

Plants for the Planet

- Check [BGCI's GlobalTreeSearch](#) to check whether a tree is native to your country
- If you are a BGCI member, you can access our members area and download country checklists of native trees



How do you know which species were there before?



BGCI

Plants for the Planet

Survey the nearest remaining forest fragment (reference forest)

- Rapid assessment, transects and plots can be used
- Take herbarium vouchers to verify identification
- Talk to local communities – particularly elders
- Collect and record as much information as possible



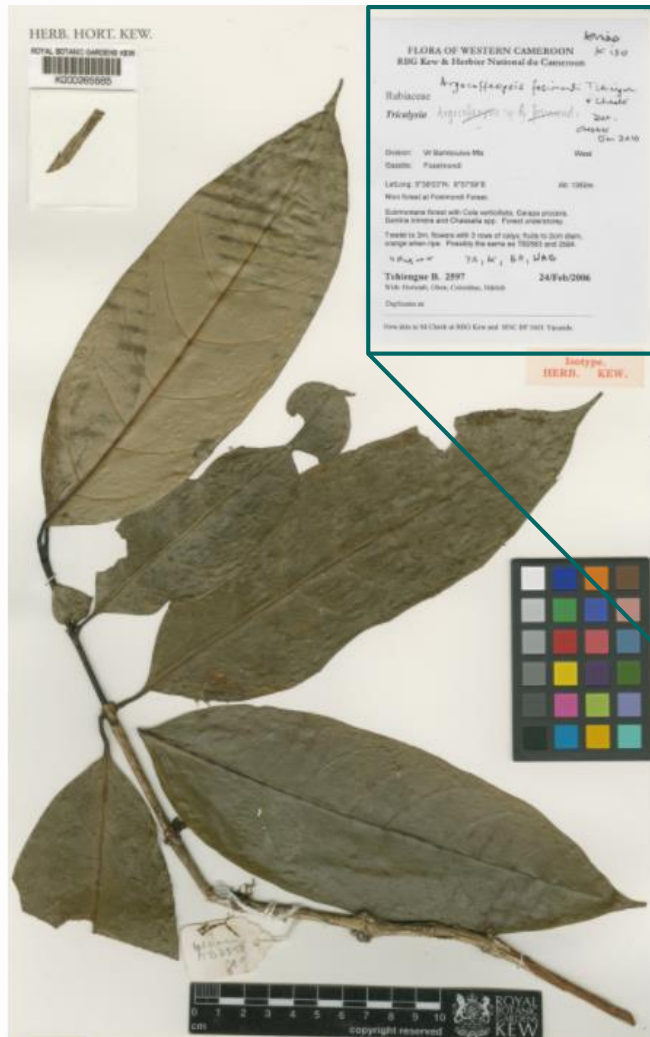
How do you know which species were there before?



BGCI

Plants for the Planet

Herbarium specimens can provide information on:



HERB. HORT. KEW.
ROYAL BOTANIC GARDENS KEW
K00006600

FLORA OF WESTERN CAMEROON
RBG Kew & Herbar National du Cameroun

Rubiaceae
Argocoffeopsis fosimondi Tchiengue & Cheek
Tricalysia ~~*Argocoffeopsis* sp. of *fosimondi*~~

Division: W Bamboutos Mts West
Gazette: Fossimondi
Label: TCHIENGUE, 2597 No. 1350
West forest at Fossimondi Forest.

Submontane forest with *Cola verticillata*, *Carapa procera*,
Santiria trimera and *Chassalia* spp. Forest understorey.

Treelet to 3m; flowers with 3 rows of calyx; fruits to 2cm diam,
orange when ripe. Possibly the same as TB2583 and 2584.

4 shrubs at K YA, K, BR, WAG

Tchiengue B. 2597 24/Feb/2006
With: Horwath, Oben, Colombus, Ndeloh

Duplicates at:

New dets to M.Cheek at RBG Kew and HNC BP 1601 Yaounde.

Species location

Habitat & associated species

FLORA OF WESTERN CAMEROON
RBG Kew & Herbar National du Cameroun

Rubiaceae
Argocoffeopsis fosimondi Tchiengue & Cheek
Tricalysia ~~*Argocoffeopsis* sp. of *fosimondi*~~ Det. M. Cheek Jun 2010

Division: W Bamboutos Mts West
Gazette: Fossimondi
LatLong: 5°38'03"N; 9°57'59"E Alt: 1350m
Ntoo forest at Fossimondi Forest.

Submontane forest with *Cola verticillata*, *Carapa procera*,
Santiria trimera and *Chassalia* spp. Forest understorey.

Treelet to 3m; flowers with 3 rows of calyx; fruits to 2cm diam,
orange when ripe. Possibly the same as TB2583 and 2584.

4 shrubs at K YA, K, BR, WAG

Tchiengue B. 2597 24/Feb/2006
With: Horwath, Oben, Colombus, Ndeloh

Duplicates at:

New dets to M.Cheek at RBG Kew and HNC BP 1601 Yaounde.

Restoration for conservation



BGCI

Plants for the Planet

The following resources can help you to identify threatened species to consider:

IUCN Red List of Threatened Species

The world's most comprehensive information sources on the global conservation status of species.



BGCI's ThreatSearch database

Global database of conservation assessments of plants.



Global Trees Campaign

The only international programme dedicated to saving the world's threatened trees.



Provenance and climate – proofing restoration



BGCI

Plants for the Planet



Threatened species

Use locally sourced material
and do not mix up provenances



Common species

Material sourced from
provenances across a wider
area is often used



Always ensure that the provenance of collections is recorded



Do I put all the species back?



BGCI

Plants for the Planet

Ecological restoration approaches include:

- Assisted regeneration
- Framework species approach
- Miyawaki approach



The appropriate approach will depend on the condition of restoration site, your restoration goals, budget and seed/seedling availability.



Assisted regeneration



BGCI

Plants for the Planet

Is the **enhancement** of the natural process of **forest regeneration**.



Can include the following:

- Removing barriers to regeneration such as fire and livestock
- Assisting the growth of native seedlings/saplings
- Encouraging seed dispersal
- Suppressing weeds

A low cost, low tech approach to forest restoration

Framework species approach



BGCI

Plants for the Planet

Aims to achieve restoration result quickly **by shading out weeds** and attracting **seed dispersers** who naturally bring in seed from other species.

Plant 20 – 30 indigenous species that:

- Are fast growing
- Have a spreading canopy
- Produce edible fruits at early stage

Trema orientalis (Pigeon wood) is a fast growing species with a spread crown and produces fruit at an early stage. It is widely distributed across tropical Africa.



Miyawaki approach

All species are planted back into the restoration site.



Advantages:

- ✓ No natural seed dispersers need to be present
- ✓ Suitable for high value, small urban sites
- ✓ Resulting forest is more likely to be resilient

Disadvantages:

- ✗ Very intensive (20,000-30,000 trees/ha)
- ✗ Very expensive (est. US\$ 9,000+/ha)
- ✗ Not suitable for large scale restoration

Summary

- **Native species** = good survival rates, biodiversity conservation, medicine &
- **High species and genetic diversity** = more sustainable results, a healthy & resilient forest
- Species selection will be determined by the goals of your project
- If non native species are planted, take care to ensure that they do not become invasive!



BGCI

Plants for the Planet

Connecting People • Sharing Knowledge • Saving Plants

Our Mission is to mobilise botanic gardens and engage partners in securing plant diversity for the well-being of people and the planet

Descanso House, 199 Kew Road, Richmond, Surrey, TW9 3BW, UK

www.bgci.org

 @bgci