

Case study of Greenland Agroforestry Nursery in Gakoe Village, Kiambu County

Target Audience: Farmers, extension agents and tree nursery operators

Introduction

Greenland agroforestry nursery is an enterprise managed by a group of farmers in Gakoe Village of Kiambu County in Kenya. The group was established in 2006 by 21 members. The membership has since grown to 31 by 2019. The main objective of the group is to improve members livelihood through environmental conservation activities. To meet this objective, the group is involved in propagation and sale of different plant seedlings of both exotic and indigenous species, which include ornamental plants, forest, fruits and other agroforestry tree and plant species. In 2010, the group benefited from financial assistance by World Bank valued at Ksh 520,200/- (US\$ 5,202), under the Natural Resource Management Project. With this support, the group expanded its nursery activities and built a greenhouse.

Objectives

- Production of tree seedlings for livelihood improvement.
- Sustainable production of seedlings for community use.
- Environmental conservation through enrichment planting of natural forests.
- Built capacity of members in tree nursery establishment and management.
- Earn income through sale of seedlings.
- Explore livelihood options through environmental conservation.

Approach

Gakoe community is mainly involved in subsistence farming that include; growing of food and cash crops as well as keeping livestock for livelihood requirements. The community however, has continued to diversify their livelihood options through establishment of plant nurseries for production of seedlings and grasses for sale and environmental conservation. Seedlings propagated in the nursery are both exotic and indigenous in nature.

Fruit tree seedlings produced include macadamia and avocado. Exotics tree species include *Grevillea robusta*, Eucalyptus, pines, cypress and Giant bamboo (*Dendrocalamus giganteus*), while indigenous tree species include *Syzygium guineense* (muzambarau, mukoe), *Filicium decipiens* (Thika fern leaf), and *Yushania alpina* (African alpine bamboo). Ornamental plants include soft araucaria, *Thuja orientalis*,



Macadamia seedling in nursery



Varied plant seedlings in the nursery



Exotic species in Greenland Agroforestry nursery



Some ornamental plants in the nursery



Giant bamboo being propagated



Sprouting bamboo growing in a green house

Impact

- Greenland agroforestry nursery has improved farmers income through sale of seedlings.
- Some of the community members are permanently employed at the nursery.
- The members have created community awareness on need to expand tree planting in schools and on farms, thus contributing to environmental conservation.
- Farmers have learnt various methods of raising seedlings, e.g. grafting.
- Welfare activities to members through sales of seedlings
- Capacity building of other farmers and tree nursery operators and groups.

Innovations and Success Factors

On-farm tree nurseries have been adopted by many farmers in Gakoe Village, Kiambu County which has been enhanced through training of farmers on nursery establishment and management.

In order to increase the number of tree nurseries and seedlings, a number of greenhouses were constructed and good nursery management practices such as proper use of greenhouse, shading nets and efficient water use were adapted. Environmental conservation has been achieved through enrichment planting of natural forests.

Increased survival period of some species, for example, tomato scion grafted on a *Solanum incanum* (Sodom Apple) species root stock.



Raising difficult to germinate plants under polythene sheet in a green house



Germinating Macadamia seedlings



Solanum incanum (Sodom Apple)



Innovatively grafted tomato seedling

Constraints

Some of the constraints experienced by the group include:

- Prolonged droughts and water rationing leading to inadequate water supply.
- Prolonged droughts leading to extended periods of seedlings stay in the nursery.
- Occasional attacks on seedlings by pests and diseases.
- Limited technical expertise as the group has only one forester.
- Inadequate space for nursery management activities as the group rents the land on which the nursery is situated.
- Inadequate market opportunities for the seedlings.

Lessons Learnt

Some lessons learnt include:

- Farmers can produce many seedlings even in a small space provided good nursery layout is adopted.
- A well-managed nursery can be a sustainable enterprise.
- Good nursery management practices such as proper use of greenhouse, shading nets and efficient water use is paramount for sustained nursery production.
- Mutually inclusive collaborative effort between communities and professionals in environment is important for sustainability of community tree nursery.
- It is important to raise plant species that are in demand as the market for such seedlings exists. For example, macadamia has high demand due to its economic value, while ornamental trees are sort after for beautification purpose.
- Use of innovative grafting practices to improve seedlings durability, resistance to diseases and long lifespan.

Conclusion

Good nursery management practices for sustained seedling production is a viable enterprise and has potential to; improve farmer's income, conserve environment, and enhance mitigation and adaptation to climate change.

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Compiled by: M. Mukolwe, J. Wanjiku and E. Njenga