RESTORATION OF SACRED KAYA FORESTS (MUDZI MUVYA, FIMBO AND BOMU) IN KENYAN COAST FOR ENHANCED PROVISION OF ECOSYSTEM SERVICES AND PRODUCTS FOR IMPROVED LIVELIHOODS

RABAI CULTURAL VILLAGE NURSERY TRAINING REPORT

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1.0 INTRODUCTION

The Kenya Forestry Research Institute is mandated with development and dissemination of technologies for sustainable management and development of forests and allied natural resources. KEFRI provides training and advisory services to farmers on proven technologies to enhance their capacity to manage and utilize forest products sustainably and conserve agro biodiversity.

Restoration of Sacred Kaya forests in Kenyan Coast for enhanced provision of ecosystem services and products for improved livelihoods is a project funded by Satoyama Development Mechanism (SDM) wing of International Partnership for the Satoyama Initiative (IPSI). The project is aimed at restoring degraded sites in 3 Kaya forests (Mudzi Muvya, Fimbo and Bomu) for enhanced biodiversity conservation and improved local livelihoods. Availability of quality tree seedlings is critical to sustain restoration efforts. Local communities lack the technical capacity to raise quality seedlings for replanting in degraded sites. In view of this, enhancing the capacity of local communities to undertake restoration of degraded sites in Kaya forests is a key component of SDM project. The actual focus is training community members on tree nursery establishment and management with ultimate goal of raising adequate number of quality tree seedlings for use in rehabilitating and restoring degraded sites within Kaya forests.

The Rabai cultural village was started in February 2013 and registered under the Ministry of culture and social services in the same year following the realization by the local community of the need to conserve their culture and the kaya forests. Traditional healing practices using herbal medicine is a key activity in the cultural village and thus the disappearance of key herbal plants used in the cultural village has necessitated the need to train the group on appropriate nursery management practices in a bid to ensure sustainable production of medicinal trees and wild food plants used by the group. Furthermore, the village has established a community nursery group focusing on raising indigenous medicinal plants in the kaya but lack of knowledge on the propagation of some difficult to propagate species as well as inadequate knowledge of best nursery management practices has been a hindrance to their activities.

1.1 JUSTIFICATION FOR THE TRAINING

The need to plant indigenous medicinal trees and conserve cultural forests is of great interest to local communities along the Kenyan coast. The Rabai community has had a long history of conserving important indigenous tree species in kaya forests, but the growing threats to these indigenous forests resulting from anthropogenic factors continue to threaten these indigenous tree/plant species. Furthermore, some of the indigenous medicinal plants are difficult to propagate and local communities lack the necessary technical skills to propagate them. These factors have necessitated the need to train the Rabai cultural group on appropriate nursery management practices in a bid to ensure sustainable production of medicinal trees and wild food plants used by the group.

The training was held at the Rabai Cultural village in Kilifi County from 31st July to 2nd August 2018.

1.2 TRAINING OBJECTIVE

The main objective was to train members of Rabai cultural village on tree nursery establishment and management with special focus on medicinal, edible fruit trees and wild food plants.

2.0 TRAINING APPROACH AND OUTLINE

The training mode was both theoretical and interactive. The following key aspects of nursery establishment and management were elaborated during the training;

1) Objectives of tree nursery establishment
2) Selection of sites for tree nursery establishment
3) Establishment of seed sowing bed
4) Potting of nursery soil
5) Pricking out seedlings
6) Post planting activities
7) Transplanting seedlings to the field

2.1 Objectives of tree nursery establishment

The main objectives of tree nursery establishment were highlighted as

a) To raise seedlings for planting in order to conserve the environment

b) To generate income both sale of seedlings and woodlot establishment

2.2 Selection of sites for tree nursery establishment

The main factors to consider when selecting a tree nursery site were listed as;

a) Availability of reliable water supply,
b) A level ground,
c) The area should be free from frost,
d) The area should be sheltered from wind,
e) The area should be easily accessible.

Hilly areas, valleys and slopes should be avoided when siting a tree nursery due to inaccessibility and risk of the nursery being flooded during rainy seasons. The group was also guided on the requirements of a standard nursery such as a shade, seed showing bed, soil storage area, soil mixing area and seedling beds.

2.3 Establishment of seed sowing bed

Participants were informed that a seed bed facilitates the sowing of fine seeds as well as seeds that cannot individually be sown into separate tubes. Use of locally available cheap materials such as stones, gravel, sand and wood was recommended for construction of a seed bed. The process of constructing a seed bed was demonstrated.

Figure 1: Demonstration of sitation and construction of a seed sowing bed

In addition, participants were taken through the process of seed sowing and tending. They were informed that the seedlings should not be slanted at any given time. The watering should be moderate and should be done early in the morning and later in the evening in order to reduce water loss through evaporation. Overwatering leads to water logged soil which causes rotting of the seeds and damping off of seedlings and hence losses.

2.4 Potting of nursery soil

Participants were informed that nursery soil should be dug and stored for three months before use for potting. This provides time for any existing weeds to germinate and thereafter be destroyed or decomposed as manure. The group was also reminded that the soil must be sieved before potting to eliminate twigs, stones or seeds that may have been carried with the soil from the forest.

Soil quality was emphasized, as it is one of the most important influences on seedling growth. Good soil has both the chemical and physical properties that promote healthy and rapid plant growth. Soil that is rich in nutrients but is very heavy does not allow water to penetrate or that which has adequate drainage but is deficient in plant food is not recommended. In order to determine suitable nursery soil for raising seedlings, mixing of different soil types was recommended as shown in the table below.

Table 1: Soil mixing ratio of different soil types

Soil type	Soil	Sand	Compost
Heavy textured (Clay)	1	2	2
Medium (loam)	1	1	1
Light (sand)	1	0	1

The members of the group were further advised on the proper land area from where soil can be collected - areas that have been eroded through soil erosion should be avoided. Poor soils should be avoided because they have low nutrient content which leads to poor plant growth and subsequent establishment. Potting should be done under a shade. The nursery soil should be well mixed before being put in containers and then firmed so that a space of 0.5 - 1.0 cm is left empty at the top in readiness for transfer of seedlings.

Figure 2: Potting of nursery soil into polythene tubes

2.5 Pricking out seedlings

Participants were informed that seedlings should be transferred from sowing bed to the polythene tubes when the seedlings develop their first leaves and a tiny rosette in the centre. The pricking

out process was described and demonstrated to the participants. They were advised that the pricking should be done under a shade to avoid prolonged exposure of seedlings to the sun.

Figure 3: Preparation of polythene tubes for pricking out

2.6 Post planting activities

Participants were advised to start carrying out post planting activities immediately the seedlings are transferred to the plastic tubes. The following were elaborated and recommended;

a) Watering
b) Weeding
c) Root pruning
d) Spraying by use of pesticides
e) Cultivation and general cleanliness of the nursery

2.7 Transplanting seedlings to the field

Participants were enlightened on the need to prepare a planting site early enough before the rains are due. The seedlings must be transplanted as soon as sufficient moisture builds up in the soil. The activities involved in site preparation include:

a) Bush clearing
b) Ploughing or tilling to improve water infiltration, root development and aeration
c) Digging planting holes - a hole size of 30cm x 30cm is adequate for planting.

d) Seedling planting; planting should begin when the rainfall has accumulated to about 100mm or the soil particles form a muddy wet pond.

Figure 4: Preparation of a planting hole

e) Preparation of water micro-catchments; Harvesting of runoffs for the planted seedlings is a pre-condition for successful tree establishment.

Figure 6: V-shaped micro-catchment

V-shaped basins of size 20cm x 20cm x 30cm high were recommended. Nevertheless, the size of the micro-catchments depends on soil type, rainfall amount and the slope of the area. The lower the rainfall, the bigger the structure required.

3.0 RECORD KEEPING

Participants were taught on the benefits of records keeping. The key records discussed were diary book and nursery record book.

3.1 Nursery Diary book

The main information contained in this record includes;

i. Number of seedlings in the nursery
ii. Number of each tree species available
iii. Number of dead seedlings
iv. Number of seedlings sold out
v. Number of seedlings root pruned
vi. Number of seedlings planted out
vii. Number of seedlings issued for free

3.2 Nursery record book

This contains the following information;

i. Source of seeds
ii. Diseases affecting the seedlings
iii. Number of seeds propagated
iv. Germination percentage of the seeds

4.0 CONCLUSION

Members of Kaya Mudzi Muvya group appreciated the good work done by KEFRI through the support of the SDM Project to build the capacity of local communities and promised to put to practice the tree nursery establishment and management skills learnt and share the knowledge and skills with other groups carrying out tree nursery activities in Rabai.

5.0 RECOMMENDATIONS

1) The community group should be regularly engaged on tree nursery management training practices for continual improvement.

2) There should be periodic monitoring of the nursery's activities in order to assess their progress in implementing best nursery management practices.

3) The group should be facilitated to visit a well kept nursery in KEFRI to learn from best nursery management practices.