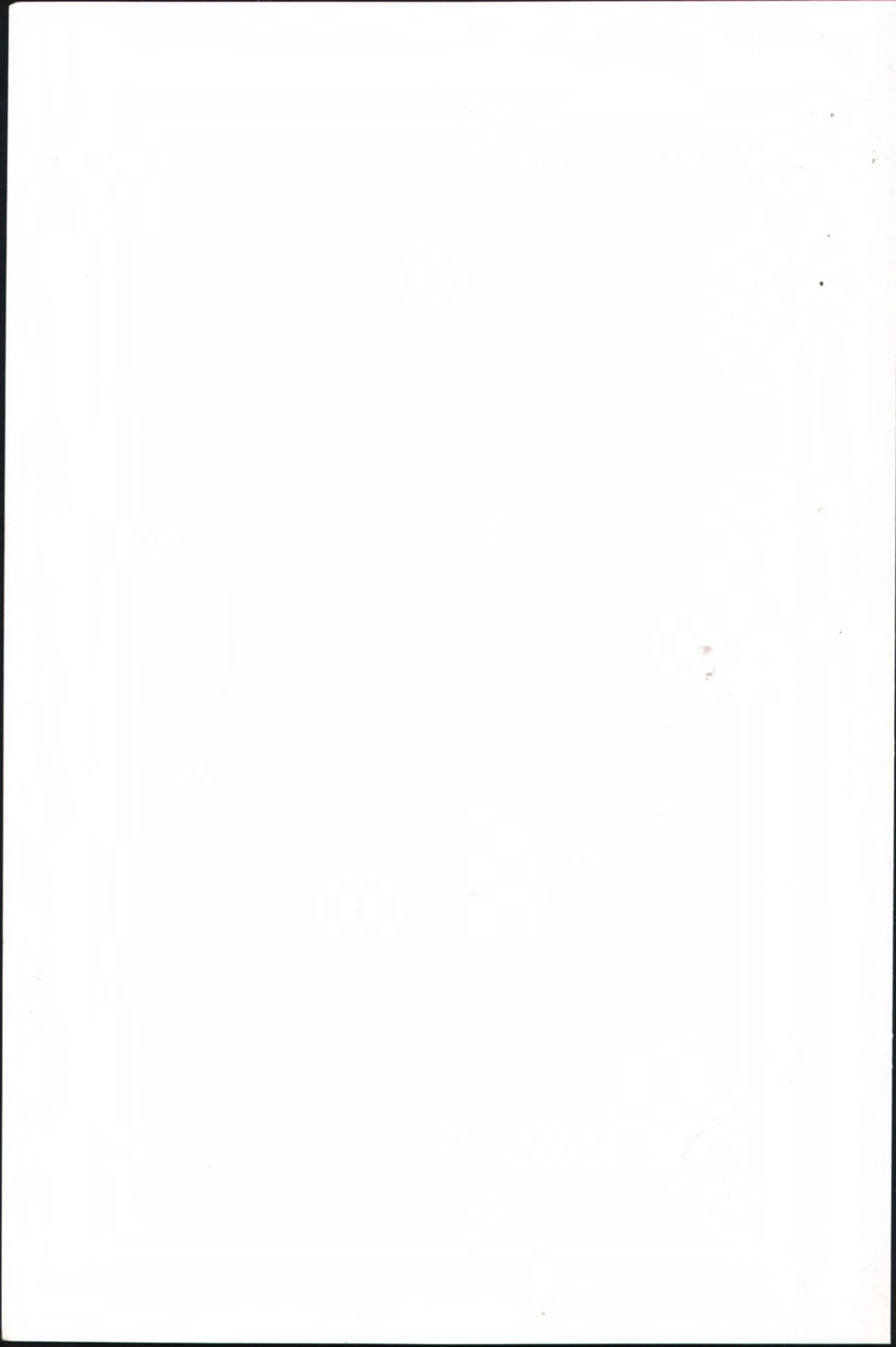


MT. KENYA'S GATHIURU FOREST BLOCK: *Hope for securing a future through joint forest management with the community*



KEFRI/IFRI-KENYA PROJECT COMMUNITY BRIEF: SERIES NO.1



MT. KENYA'S GATHIURU FOREST

Hope for a secure future through community participation

by

Paul O. Ongugo, Jephine N. Mogoi and Emily Obonyo-Kamau

**with contribution from:
Gordon Sigu and Tom Omenda**

**IFRI KENYA PROJECT COMMUNITY BRIEF NO. 1
May 2006**

MT. KENYA'S GATHIURU FOREST

Hope for a secure future through community participation

Kenya Forestry Research Institute (KEFRI)
International Forestry Resources and Institutions-
Collaborating Research Centre in Kenya (IFRI CRC-K)
P.O. Box 20412- 00200
NAIROBI, KENYA
e-mail: ifrikenya@kefri.org
Website: www.ifrikenya.org

Cover photos:

Clockwise: Women Collecting firewood , Remnants of Gathiuru forest, Local Community group conserving their forest, Charcoal burning in the forest. Centre: Community members establishing a plantation.

Photos courtesy of the IFRI Kenya Team

Illustrations by Charles Nyogot

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PREFACE

The Kenya Forestry Research Institute (KEFRI) was established in June 1986 by an Act of Parliament to undertake forestry research and development. The mandate of the institute is to conduct research in forestry, disseminate research findings, co-operate with other research bodies within and outside Kenya carrying out similar research and to liaise with other organizations and institutions of higher learning in training and on matters of forestry research.

KEFRI implements its research through five research programmes: Farm Forestry, Natural Forests, Dryland Forests, Plantation Forests, and one Service Programme dealing mainly with information documentation and dissemination. KEFRI has six research Centres namely: Muguga, Karura, Kitui, Gede, Londiani and Maseno.

KEFRI headquarters is located about 25kms northwest of Nairobi city and two kilometers off the Nairobi-Naivasha Nakuru highway.

The International Forestry Resources and Institutions Collaborating Centre Kenya (IFRI CRC-K) was started in KEFRI in 1997 under the Natural Forests Programme. With funds from Ford Foundation, the IFRI CRC-K carried out studies on several sites all over the country to establish the status of the forests and institutions therein. By studying the intricate relationships between communities, resources and forests, the programme has recognised the role local communities play/or could play in the management of the forests. It studies the role of local institutions in the management of common pool resources such as forests and water catchments.

IFRI CRC-K established a site in Mt. Kenya's Gathiuru forest in 2001. This community brief highlights some of the major findings at the site, reports on the problems experienced by the community and proposes some possible solutions to those problems. By sharing this information with the community and other stakeholders, the IFRI programme aims at highlighting issues that would eventually influence policy makers in making decisions taking into consideration the community's perspectives regarding forest resource utilization, conservation and management. It also trains the community members on nursery establishment, management and other techniques.

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1. INTRODUCTION

Kenya's forests contribute significantly to the national economy, and provide indirect benefits to the country as water catchments. Forests also conserve water and soil, act as carbon sink and serve as reservoirs for biological diversity. For these reasons, Kenya's forests should be protected to ensure the survival of Kenyans and that of their future generations.

Management of forests in Kenya has been undertaken by the government with minimal involvement of local communities. The result of this near exclusive government involvement is clearly seen in the condition of the country's forests today which have been reduced from a once beautiful green belt to a few isolated patches.

Many organizations including Kenya Forestry Research Institute (KEFRI) have called for a change in the forest policy to reduce the destruction of forests through improved management practices. Scientists in Natural Forests Research Programme in KEFRI have been working in collaboration with Indiana University's International Forestry Resources and Institutions (IFRI) research programme to advocate for policy change that would lead to sustainable forest management in participating countries.

2. GATHIURU SETTLEMENT

The IFRI team carried out a Participatory Rural Appraisal (PRA) with members of the community living adjacent to Gathiuru forest to find out among other things, how the settlement came into being, how the community views the forest, the problems they experience and the possible solutions to such problems. (Figure 1).



Figure 1: The IFRI team meeting with the Gathiuru community

According to the community, a colonialist in the name of Captain Hook was given the land adjacent to the forest by the colonial government after the First World War. Captain Hook gave up the land after independence in 1963 and the first President of the Republic of Kenya, the late Mzee Jomo Kenyatta in turn gave it to one of his bodyguards called Mr. Kariuki who later sold it to individuals. In 1981, the first group of farmers moved in to the area and the settlement has since grown in size. By the time the team visited the settlement in 2001, there were 560 households with a population of 2 440 people.

2.1 Gathiuru Community

The people of Gathiuru are mostly Bantu speaking. The main ethnic communities are Kikuyu (80%), Meru (15%) and Turkana (5%). The Kikuyu, who migrated to the foothills of Mt. Kenya in the 1500s, regard the mountain as a sacred place and a central part of their creation myth. According to the tribal legend, their god, *Ngai* created Kirinyaga (Mt. Kenya), "the mountain of brightness" as an earthly dwelling place from which he could watch over his creation and bestow blessings and punishment upon his people. He granted Gikuyu, the founder of the Kikuyu tribe a share of the rich land below the mountain. *Ngai* instructed Gikuyu that if he was ever in need, he should make a sacrifice and raise his hands towards Kirinyaga, and *Ngai* would come to their aid. He also pointed out a grove of fig trees, which the Kikuyu regard up to today as sacred. In times of need, such as drought, Kikuyu people still turn towards Kirinyaga and perform ceremonies to *Ngai*. Other communities who live around the mountain (the Meru and Embu) also revere the mountain. For all these communities therefore, Mt. Kenya remains a strong cultural symbol, which should be preserved.

During the meeting with the community, the IFRI team recorded major changes, which had occurred in the area from the time of independence in 1960s to 2001 (Table 1).

Table 1: The major changes experienced by the Gathiuru communities since 1960's

Year	Status of the forest	Major changes in the settlement	Reason for the changes
Before World War II	Whole area forested	No major change	-
After World War II	Some area of forest converted to farms	Land given to Captain Hook	-
1963 (at Kenya's Independence)	Some area of forest converted to farms	President Kenyatta gives out the land to Mr. Kariuki who sells it to farmers	Division of land to Kenyans due to independence
1963-1980s	Decreasing area of forestland	Forest further excised to cater for those affected by the shamba system	-Increased population of squatters. -Expansion of the social amenities and other institutions
1980s	Decreasing area of forestland	Sub-division into smaller portions of the forestland for sale by farmers of Gathiuru settlement	Population growth due to natural causes
1994	Decreasing area of forestland	-Ban of shamba system -Ban on harvesting of forest products	Increased forest destruction due to poverty and poor government policies
1999	Depletion of forest cover	-Migration of non-residential-cultivators to Gathiuru settlement - Further sub division of land to accommodate farmers evicted from the NRC farms	- Ban of NRC -Increased population
2004	Depletion of forest cover	Ban of NRC system	Realization that forest cover is way below the accepted standards and that NRC is not succeeding in plantation establishment

Due to increased population in the area from 1960s to 1980s, (Table 1) more roads, schools and dispensaries have been built in the last ten years. There was also an establishment of a water project in the 1990s to provide clean water to the settlement and the sub-location in general.

2.2 Importance of the forest to the community

The forest supplies 100% of fuel wood used by the community. Other major products harvested by the community from the forest are timber, poles, posts, fruits, grass, honey, fuel wood, charcoal, herbal medicine (Figure 2), game meat and food.



Figure 2: Barks harvested from the forest for medicinal use

During the PRA products from the forest were ranked according to gender and age preferences (Table 2).

Table 2: Importance of forest products based on gender preference

Rank	Women	Men	Youth
1.	Water	Timber	Water
2.	Food*	Fencing posts	Food
3.	Fuel wood	Charcoal	Fuel wood
4.	Charcoal	Fuel wood	Charcoal
5.	Timber	Water	Timber
6.	Medicine	Grazing	Medicine
7.	Fencing posts	Fruits	Fruits

2.3 Benefits of the forest to the community

The people of Gathiuru forest benefit greatly from the forest. Among the benefits include: firewood, poles and posts, charcoal, timber, fodder, provides water catchments and cool climate, source of water and “attracts” rainfall



Figure 3: Women fetching firewood



Figure 4: Lorry carrying logs

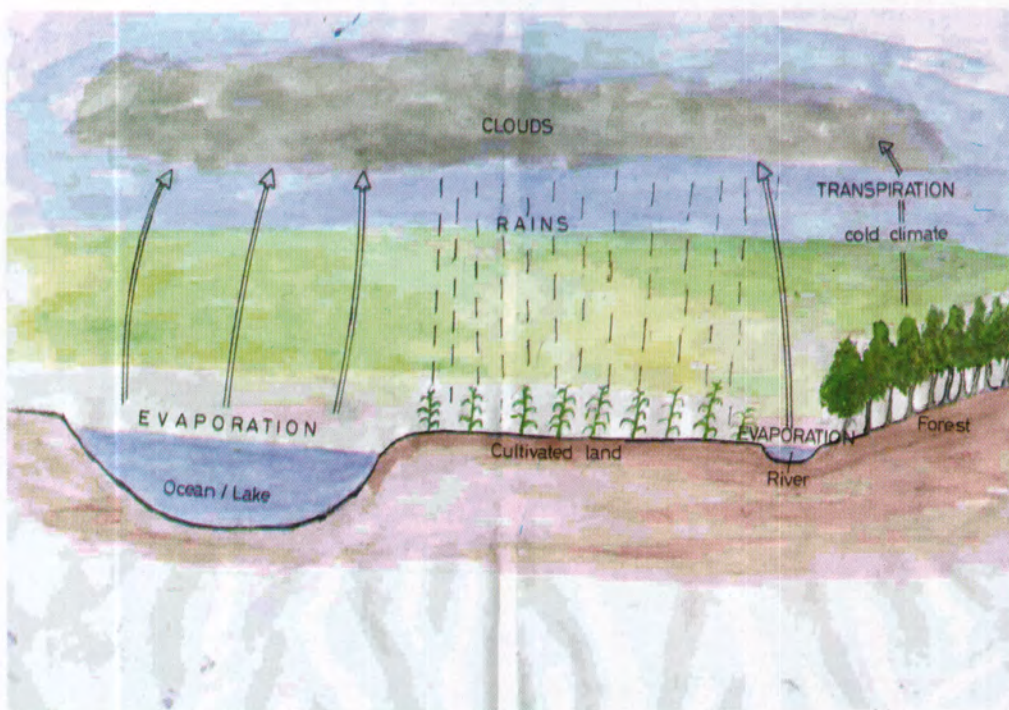


Figure 5: Role of forests in the water cycle

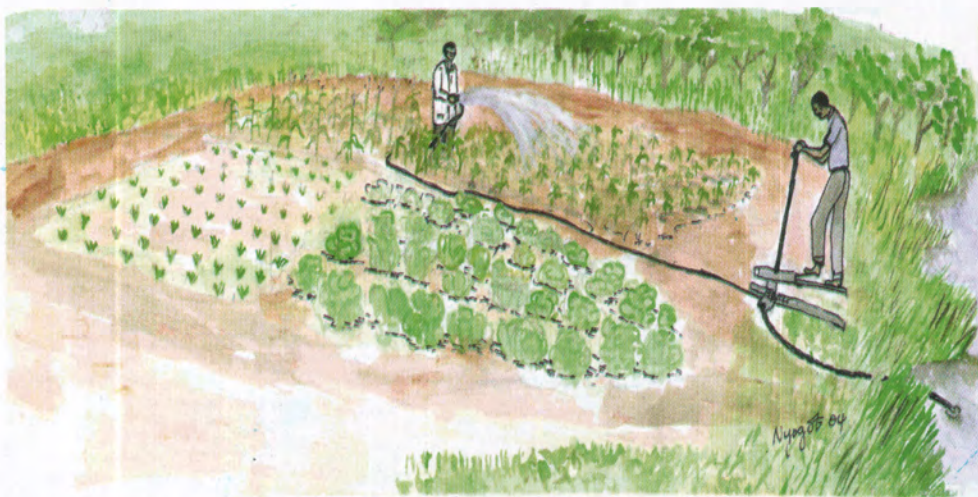


Figure 6: The importance of forests as a source of water for irrigation

If the forest is so important to the community, the question remains, 'why has its destruction continued unabated?' The team was given different answers to this question, most which related to meeting the basic needs of the community. Erratic changes in weather patterns resulting in frequent droughts coupled with poor soils make the people depend on the forestland for cultivation. From the answers, it was possible to identify the following activities that lead to forest destruction:

- Illegal logging especially of the endangered *Ocotea usambarensis* (Camphor) and the *Juniperus procera* (Cedar) and other hardwood species.
- Cultivation of *Canabis sativa* (bhang)
- Charcoal burning
- Livestock grazing
- Uncontrolled NRC cultivation
- Occurrence of forest fires

2.4 Major problems facing the Gathiuru Community

The major problems facing the people of Gathiuru forest include:-

- **Unemployment:** Most people, especially the youth, are neither employed nor have enough education and appropriate skills to compete for jobs in the job market. They therefore rely on the forest for their livelihoods.
- **Conflict between the FD and the forest users:** The relationship between the forest users and the Forest Department was one plagued with mistrust and suspicion. There were constant conflicts caused by the forest adjacent communities harvesting forest products illegally. This situation was aggravated by the ban on exploitation of forest products and cultivation in the forest by the government. While the ban was intended to protect the forest, it resulted into loss of the forest itself and government revenue thus escalating forest destruction.
- **Conflict between forest users and Wildlife:** Most of the crops are lost due to destruction by wild animals especially elephants. This discouraged the farmers from planting food crops and instead most opted to exploit the forest for income generating activities. The majority of the youth were engaged in charcoal burning, pole and post cutting and firewood business as source of livelihood.
- **Non-residential cultivation (NRC):** There is a complex problem on the issue of NRC. There have been constant conflicts between the FD and the farmers due to NRC. The cultivators have been blamed for the destruction of the forest and as a result sent out of the forest. The latest incident of their eviction in 2004 left almost 15,000 seedlings that were to be planted in the farms unattended leading to huge losses. This eviction also aggravated the problem of unemployment and food security in the area further worsening the already poor relationship between the community and the FD.

●**Lack of Technical Advice:** Members of the community were eager to be involved in planting of trees and undertake forestry activities. However they lacked the appropriate nursery and seedling handling skills to establish and manage their own nurseries and trees.

●**Foreign Loggers:** The community complained of commercial loggers coming from outside the area and clearing their forest.

●**Equity in sharing benefits from NRC:** There was lack of a framework for sharing benefits from the forest between the community and the FD and among the members of the community.

3.5 Suggested solutions to the identified problems

a) Unemployment

- Community to be provided with agro forestry tree species to grow within their farms and to be given advice on how to manage the trees. This would reduce their dependence on the forest and the trees would be a source of income for the households.
- The community can liaise with the government so as to lease land from the government on which to grow fast growing trees for the production of charcoal and other forest products for sale.
- Since there are Community Forest Associations in the area, a pilot joint forest management project between the FD and the community could be explored.
- The government to be encouraged to promote eco-tourism, which would generate income and provide employment for the community.

b) Conflict with the Forest Department

The FD and the community have to work together and remove the mistrust between them. The following are suggestions on how this could be done:

- There has to be a shift from the “them” and “us” attitude that is currently in place to a “we” attitude that could make the communities identify with the forest and consider its management as their own responsibility.
- The FD should offer technical advice to the community on a continuous basis to ensure that forest related activities are done sustainably.

c) Problems with wildlife

- The government, the community and other stakeholders to work jointly and put up an electric fence in areas where there are human-wildlife conflicts (wildlife damage to crops)

d) Non Residential Cultivation

Successful establishment of plantations is one of the most expensive activities in forestry development. The NRC/*Shamba* system had been identified as a way of providing cheap labor in the establishment of forest plantations and also ensuring food security and rural employment.



Figure 7: Typical squatter hut used by NRC cultivators when guarding their crops from wild animals.

To ensure a successful practice of NRC, the following should be undertaken:

- In absence of any other alternative, the NRC should still be used as a method of plantation establishment and where the system has failed, reasons for its failure should be addressed before reintroduction.
- The NRC should be restricted to sites designated for tree planting within the year under plan. This would ensure that the trees are planted on these sites.
- There should be strict supervision of the designated plots to ensure that the trees are planted in time, in the correct way and that they are well cared for.
- Cultivation period should not exceed three years after tree planting on a given area. However, the FD should not be obliged to allocate another area to compensate the one on which trees are planted.
- The FD should encourage involvement of the local communities through community associations to manage designated areas and ensure that trees are planted on scheduled areas.

e) Logging

In order to reduce illegal logging, barriers should be put across all access roads to the forest. This would help in monitoring forest activities. The logs should also be given an official mark at the point of collection to enable the officers separate the legal from the illegal logs.

f) Water

Since some of the people in Gathiuru have access to piped water, they should utilize it to develop nurseries and to irrigate their farms. The government along with NGOs should ensure that piped water is extended to more people. This will reduce the workload on the women and thus increase production in their farms.

g) Income generaion

The community can utilize their forest as a source of income for non-consumptive purposes such as eco-tourism. Activities such as camping, hiking and sight seeing should be encouraged. The proceeds from the eco-tourism activities and other revenue generated from the forest can be ploughed back to the community to develop social facilities such as hospitals (figure 8), schools and access roads.



Figure 8: Provision of health services through accrued forest income.

h) Technical Advise

The problem of lack of knowledge in raising tree nurseries can be solved through training some members of the community who have an interest in nursery management. They in turn would be expected to train other members of the community. The government and NGO's working in the area would facilitate this. Through the IFRI programme, KEFRI will undertake the training of some members of the Gathiuru community and the other areas where it has established sites. IFRI also hopes that the guidelines provided in Annex 1 in establishing a tree nursery will be useful to the community.

4. WAY FORWARD

- (a) The Gathiuru community largely depends on the forest for their livelihood. The ban imposed by the government on the harvesting of forest products is a direct impetus for continued destruction of forests. With nowhere else to go and no industries to offer employment or large farms to cultivate, the members of the community may be forced to continue 'stealing' from the forest.
- (b) Since the government does not have enough resources to carry out effective monitoring of the forest, it should work together with the community. This may offer a lasting solution to the problem of forest protection, while offering the community a source of livelihood.
- (c) The parcels of land in the settlement are too small to sustain the needs of most families in the community. The government should liaise with the communities and work with the existing Forest Associations within the communities to finally solve this problem. The NRC system should also be restricted to sites designated for tree planting within the forest and the members of the community would provide the labour necessary in exchange of cultivating in the forest. There would be need to supervise these very strictly.
- (d) The government needs to consider privatising some activities currently being undertaken by the FD like nursery establishment and tree planting to directly benefit the community through revenue collection. They also need to involve all the users and stakeholders in decision-making regarding the resource, which could lead to better utilisation of the forest.
- (e) One major problem that the FD faces is inadequate resources in terms of personnel and finances to protect the forests. If they were to work together with the community, the problem of personnel to protect the forest would be solved. If members of the community begin to regard the forest as their own, they would loyally monitor activities there in.
- (f) The government has also introduced 'free' primary education. Further investigation with the members of the community is needed to ascertain whether the introduction of free primary education and the promotion of the girl child education have reduced the rate of harvesting products from the forest.

ANNEX 1: REQUIREMENTS FOR ESTABLISHING A SUCCESSFUL TREE NURSERY

Site of a nursery

A tree nursery should be located in an area with the following characteristics

1. Reliable water supply
2. Level ground
3. Easily accessible by vehicles
4. Free from frost
5. Sheltered from wind

A nursery should not be located at a hilltop since transport will be difficult or the valley since the area can be water logged. The nursery should as much as possible be surrounded with a live fence to help reduce water loss from seedlings by the fence acting as a windbreak.

To produce 200,000 seedlings, a 100m long and 20m wide nursery is necessary, while 100m by 50m will be necessary to raise 500,000 seedlings. A standard nursery layout should have a shed, seed sowing bed, soil storage area, soil mixing area and seedlings beds (Figure 9)

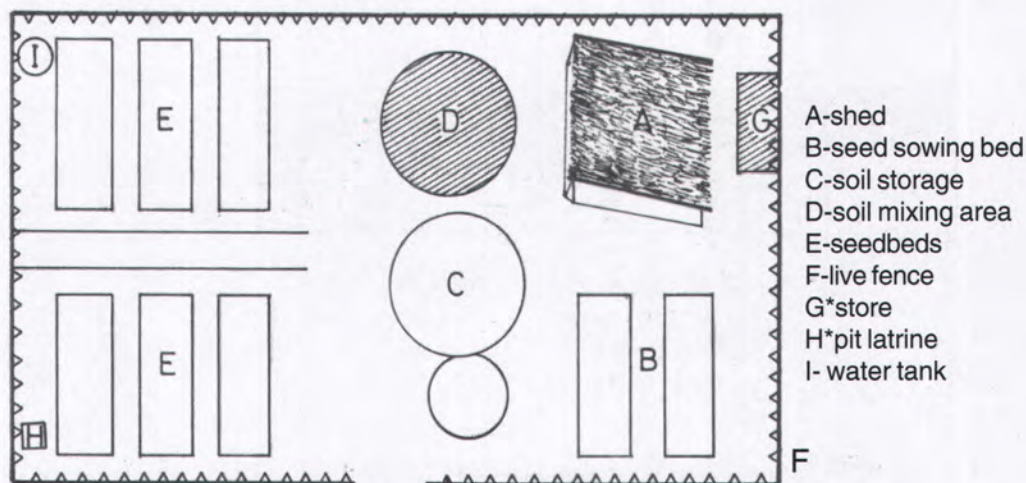


Figure 9: A typical standard tree nursery layout

*These items are not mandatory, in cases where the nursery is near homesteads, the already available store and latrine can be used.

Seed sowing bed facilitates the sowing of the fine seeds of tree species such as casuarinas and eucalyptus that cannot individually be sown into separate tubes. However large seeds can be sown directly into tubes and containers.

The sides of a seedbed should be 15cm (6 inches) high above the ground with the bottom 5 cm made up of broken stones, the next 2.5cm filled with gravel and the top 7.5 cm filled with river sand. Sawn timber, bamboo or logs of at least 17cm are placed so as to make a seed sowing bed of the desired length. Wooden pegs are used on the outside to hold the timber, bamboo or logs in place, while the stones, gravel and sand hold them from the inside (Figure 10).

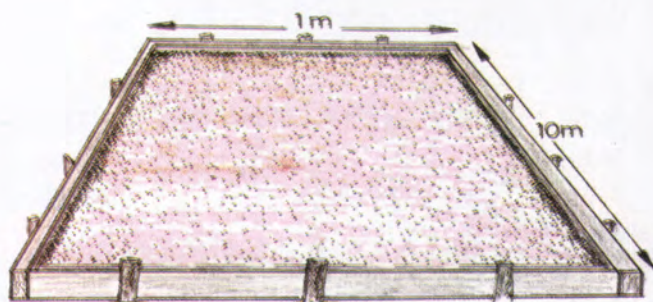


Figure 10: Seed Sowing bed

Plant nutrients in the seedbed should be supplied to help the seedlings attain pricking out height. It's not advisable to use soil in a seedbed as it may result in water logging which kills seedlings. Therefore, sand, charcoal dust or saw dust is used. Sand should not be filled to the top of the bed or container. A space of 2cm to 3 cm should be left at the top (Figure 11).

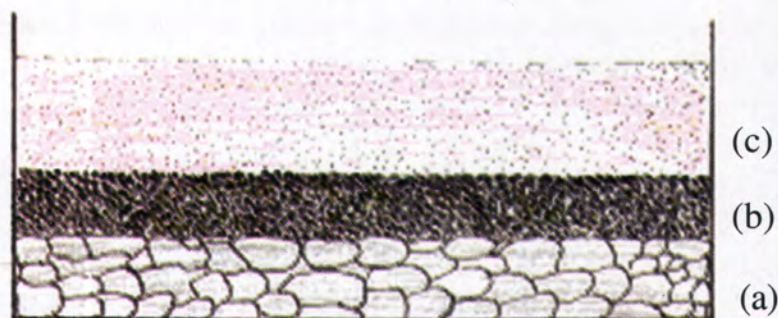


Figure 11: Soil Profile of a seed bed

- (a) Broken stones
- (b) Gravel
- (c) Sand or charcoal dust combined with soil

Seeds should be covered with a layer of sand twice their size and ensure no seed is visible. Seeds should be sown during the dry season when there are no seeds of weeds and when the watering can be regulated. A tree branch for watering should be used to avoid splashing the sand and the seed. Cover the sowing bed with mouse wire to keep off the mice and the birds. Inspect the bed daily and cover any exposed seed. The seed may take 1-4 weeks to germinate depending on the soil and the area.

Nursery Soil

Soil should be collected from the indigenous forest but never below 15 cm and not from cultivated land. The soil should be kept in the nursery for at least 2 months before use to give the weed seeds time to germinate and thereafter die through the processes of watering and turning over the soil.

The forest soil should be sieved before it is mixed with other ingredients to eliminate parts of trees or stones. Nursery soil is usually composed of the following ingredients:

- 5 parts of Forest soil
- 1 part of compost manure e.g. cow dung manure
- 1 part of Crushed stones
- 1 part of Clay crushed to 0.5 cm particles
- 1 part of Pine soil (when raising pine seedlings)

To every cubic meter of soil mixture, 2 kgs (the equivalent of a big tin of Kasuku or Kimbo) of nitrogen, phosphorus and potassium (NPK) fertilizer is added and thoroughly mixed. When raising pine or casuarina seedlings, soil obtained from under these trees is also added since such soil contains micro-organisms required for the development of the tree species. In absence of the above, fertile top soil should be used with addition of manure.

The soil is then put in a seedling bed (Figure 12), polyethylene tubes or other containers, perforated to allow water to flow downwards to give the soil air for root development. Seedling beds are 18 cm high from the ground and 1 m wide.

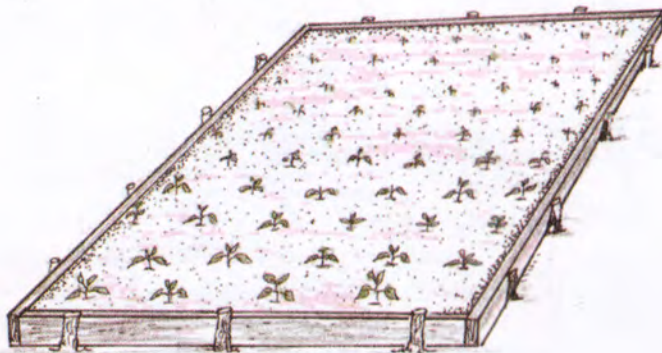


Figure 12: A seedling bed

Polythylene tubes can be 10 cm wide and 15 cm long when laid flat. For slow growing species like most indigenous trees, large tubes should be used (Figure 13).



Figure 13: Seedlings in polythylene tubes

Other locally available containers can also be used instead of polythene tubes. (Figure 14)



Figure 14: Alternative seedling Container

Soil is filled in the containers and firmed to allow 0.5 to 1 cm space at the top. Seedlings from the sowing bed are then planted in the containers. This is done when seedlings develop their first leaves. The seed sowing bed is watered before removing the seedlings to loosen the soil around the roots. The seedlings are then put in a water container to avoid drying up. Before planting the seedling, cut a third of the long root and do not bury the stem in the soil when planting. However, slight deepening of the stem below the root collar does not interfere with seedling development (Figure 15.)



Figure 15: Planting seedlings into containers

In the figure 15 above, (a) is recommended while (b) is not recommended

Seedlings in containers should remain in the shed for 2 weeks, then taken out under light shade for 1 week and can then be left without the shade. Seeds in a nursery are provided with shade and the amount of shade is reduced after 2 weeks, while all the shade is removed after another week (Figure16).

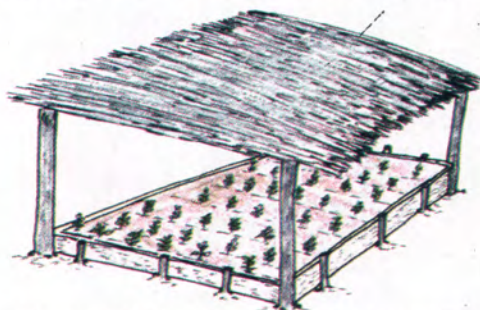


Figure 16: Shading pricked out seedlings

Seedlings should always be watered, weeded and root pruned. Root pruning is done 6 weeks after planting and every four weeks thereafter to facilitate the development of a more fibrous root system. Watering of seedlings should be done twice a day; in the morning and in the evening when the sun has gone down.



Figure 17: Green House

Seedlings can be put in greenhouses where the temperature, sunlight and moisture are regulated (Figure 17). Seedlings should be ready for planting when they attain a height of 4-12 cm depending on the species.

Diseases and Insect Attacks

The nursery heads or caretakers are expected to report outbreak of diseases and insect attack noticed on seedlings. Private farmers should make such report to the forest officers in their areas for advice.

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