KENYA FORESTRY RESEARCH INSTITUTE

SURVEY OF TECHNIQUES USED IN FOREST HARVESTING IN KENYA

Report of Techniques used in
Kwale and Taita Taveta District

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Survey Conducted By

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SURVEY OF LOGGING TECHNIQUES USED IN FOREST HARVESTING IN KENYA

INTRODUCTION

Wood harvesting involves the entire operation of felling, limbing, bunching, skidding and final transportation to the mills. It plays an important role in development of both the forest resources and forest industries since it acts as a link between them.

A proper harvesting system should be environmentally, socially and economically sound. To achieve such a system, social economic studies of harvesting systems has to be done, to come up with a properly managed harvesting system. The methods and equipments used should relate well to the soil, residue trees, user and at the same time be economical to use.

A properly managed and used forest should aim at creating increased wealth of a country's forest resource base and should stimulate the development of forest industries which in turn can improve other sectors of the economy. This will result to better employment possibilities, an increase of goods and improvement in the living standard of the population thus playing an important role in overall development of the country.

The choice of logging system is affected by the type of forest, size of trees, size of operation, soil and topographical conditions. All these affect the cost of wood. A most important requirement for any modern utilization project is an integrated plan for opening up the forest, ensuring a steady supply of raw material on one hand and enabling work to be carried out so as to preserve the forest and environment. Such overall planning is especially required when many individual small scale forest owners and/or logging operators are involved.

The logging system used in Kenya are diverse and are dependent on the harvesting equipment being used. The large companies are mechanised, mainly using industrial and crawler tractors for harvesting. The medium scale industries use farm tractors for skidding and chainsaws for felling. Small scale operators are least mechanised mainly using manual methods in harvesting. The data on the systems used and levels of technology used is lacking. The documentation of the

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systems used would be of great help to researchers and managers since it would form a base for improvement of methods/equipments used to make them economically, socially and environmentally acceptable. The various constraints faced by farmers would form a basis for project designs aimed at improving the current situation of forest harvesting in Kenya.

OBJECTIVES

1. Document the harvesting systems, equipment tools, level of technology used in forest harvesting in Kenya.
2. Determine constraints faced in forest harvesting in Kenya.
3. Effect of size of industry, and terrain on choice of equipments and logging system.

Areas Covered in Phase I

- Coast Province - Kwale district and Taita Taveta district.

Areas to be covered in Phase II

- Central Province, Rift Valley and Eastern province.

TECHNIQUES USED IN FOREST HARVESTING IN KENYA

REPORT OF VISIT TO COAST PROVINCE

Districts Covered: KWALE AND TAITA TAVETA

A KWALE DISTRICT:

1.0 BACKGROUND INFORMATION

Kwale district has an estimated forest area of 35,000 hectares (ha). About 34000 ha fall under natural forest. Plantations occupy 1000 ha. A total of 6345.5 ha of the natural forest is under mangrooves. There are no sawmills in Kwale. This means that the logs cut are transported to Mombasa where the sawmills are situated. The district was chosen for study of harvesting of mangrooves and selection harvesting of indigenous forest.

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2.0 HARVESTING METHODS

2.1 Harvesting of Mangrooves:

The mangrooves forest is located 60 km from Kwale town. Selection harvesting is used. The harvesting crew uses a boat for sailing to the mangroove area from the shore. The timing is such that they leave in the morning with the tide and then come back in the evening with the same. Equipments used for cutting are pangas, axes and saws. The boles cut are loaded on the boats for transportation to the shore. Once on the shore, the boles are classified and stacked depending on the diameter size. The boles are then transported to the consumers mainly in Mombasa by lorries.

The forest department controls the harvesting by issuing each licencee a specific number of boles to cut per year and limiting the number of licencees.

The end use for the boles is building poles (Boriti, Mazio, Pau, Fitto), trusses and fuelwood.

2.2 Selection Harvesting in Natural Forests:

Natural forest cover an area of 35043.9 ha. The major commercial species are, Newtonia paucijuga, Brachystegia spiciformis, Entandrophragm angolense and Terminalia brevipes. The two major licencees are Kwale sawmills and Krishna sawmill.

Selection harvesting is done in natural forest. The trees removed are identified by the forester who marks the tree for the sawmiller. It is the responsibility of the sawmiller to cut the tree, crosscut and skid it to the roadside. Tools used for felling is powersaw, after which the tree is delimbed using pangas and axes and later crosscut using powersaw. Once the tree is ready for collection the sawmiller engages a crew of local people to load the logs onto the lorry. This crew does the opening.up of the forest for the lorry to pass through up to the point where the logs are located. The same crew does the loading. Loading is mainly manual with an assistance of a craine which is mounted on top of the lorry. The lorry carrying up to ten logs transport them to Mombasa where the sawmills are located.

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2.3 Sawmills and Constraints faced by Sawmillers

2.3.1 Kwale Sawmills

The sawmill located in Mombasa island was started in 1944. The sawmill consumption is about 500 m^3/year from government forest and another 500 m^3/year from farm woodlots.

Constraints faced in harvesting

(i) Transportation cost for logs is very high due to the long distance transported. The cost is excerberated by the cost of operating the crane and delays in the ferry. Delays in the ferry (ferry connecting Kwale and Mombasa Island) minimizes the number of trips made per lorry to a maximum of two per day.

(ii) The sawmillers do not have harvesting machineries like tractors. Instead they use the lorry to enter to the point where harvesting can be done to only those areas whose terrain are permitable for the lorry. Consequently, some large areas which are inaccessible to the lorry are not harvested. In such cases a modified farm tractor could be better in removing the logs from the forest. The farm tractor will tolerate to some extent bad terrain and at the same time it can be used during wet seasons.

(iii) Fellers lack training on how to service the sawblades. This combined with the hardness of trees being felled makes the fellers change blades of the power saw after felling 2-3 trees. Felling can be more efficient through training of power saw operators on how to sharpen and do minor servicing of the power saw.

(iv) Defects in wood. Most trees have defects due to heart rot and stem cracks. This makes the felling operation risky and reduces recovery of wood. The hardwood felled has high proportion of sapwood compared to heartwood. This sapwood cannot be used as timber since it is degraded at a high rate by termites and other wood degrading agents. Once the logs are transported to the mills, they do split as they dry up. This is partly due to method used in seasoning, To prevent logs splitting, metal plates could be nailed at the edge of the logs.

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End Uses: The timber sawn is sold and some used for furniture production.

2.3.2 Krishna Sawmill

The sawmill located at Changamwe, started operating in 1940. The harvesting methods used are like the ones used in Kwale Sawmills. The constraints faced by this sawmill are the same as those faced by Kwale Sawmill. Besides those constraints, the sawmill operates with an old sawing machine which is manually operated. This slows down the production in the sawmill. The sawmill has only one feller who doesn't know how to service the power saw. This means in case of minor problem to the power saw, work has to stop.

The sawmill stands to gain if they replace the old blades with new automated blades. This will increase the productivity of the mill. The sawmill has a furniture section in which quality furniture is prepared.

3.0 CONCLUSIONS AND RECOMMENDATIONS

Kwale district has a large area under mangroove which is presently under-exploited. The management of this area is also not well defined since the forest department who are supposed to manage have no access to this area due to lack of transport means. Method presently used for transporting harvested material is quite limiting since it only relays on the tide. Selection harvesting being practiced need to be improved by introducing farm tractors for removing logs from the forest. Training of fellers on how to service the tools and equipment would reduce delays caused by break-down of machines.

Further detailed studies on techniques for harvesting mangrooves is necessary in order to get cost effective harvesting methods for mangrooves forest in the district.

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B) TAITA TAVETA DISTRICT

1.0 Background Information

The district has a wide range in altitude and weather variation. While Voi is low-lying and hot, Wundanyi altitude is high and the weather cold. Most of the forest areas are found in these mountaineous hills commonly known as Taita hills. Taita Tavete district was selected for study of the difficulties encountered in harvesting forest in areas with difficulty terrain.

The forest area consist of small scattered forests mainly at the hill tops. The lower area is used for agriculture. The major forest activity is conservation and protection. There are some limited plantations areas but the greatest problem is how to harvest them. Some of these plantations have reached maturity, but cannot be harvested due to nature of terrain. The main plantation species is cypress and pines.

The district has no sawmill, and as a result most of the timber exploitation is being done by pitsawyers.

2.0 Harvesting Techniques in areas visited

2.1 Ronge

This is a hill located between Wundanyi and Voi. Its a steep hill, from the bottom to the top, being 12 km of road climbing. Where the forest is located is relatively flat and fertile. The pine plantation is mainly used for tapping of resin by Rosin Kenya Ltd. Most of the plantations are due for harvesting but the terrain conditions makes harvesting difficult.

2.2 Kinyesha Mvua:

This forest is located 25 km from Wundanyi town. The plantations were established in early 60's. They are situated in difficult terrain areas, and this makes harvesting difficult. The trees have reached maturity age, with some of them drying up. The forested area is a water catchment area. This means its important to have a ground cover in such an area. Presently the plantations have no undergrowth and this risk the area being left bare once the present crop dries up. This calls for a gradual replacement of the present plantation with indigenous trees which are more suitable for water catchment areas.

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The Taita Taveta development programme (sponsored by Dannida) had come up with a proposal on how to harvest the plantations. They intended to use heavy machinery which the Kenya government considered inappropriate. Discussions were going on how to implement the project with a few modifications. This is an area where KEFRI could be involved in trying out harvesting techniques and consequent replacement of the present plantation with indigenous trees.

2.3 Methods of Tree Exploitation in the District

There is no sawmill or sawbench in the district. This leaves pitsawing as the only major exploitation technic practiced in the district. Alot of exploitation is in farm woodlots. The main constraint faced by the pitsawyers, is the cost of trees in relation to cost of timber. Majority of available trees are pine trees which do have alot of gum resins, which often block the blade when sawing, making sawing difficult.

In areas with difficult terrain, pitsawing has great potential as a way of exploiting the resources in such areas. The pitsawyers need to be adviced on proper maintenance of their saw blades and on methods which they can use to achieve higher recovery.

2.4 Extent of Farm Woodlots in the District

Tree planting on farmlands is widespread in the district. This is more so in Wundanyi and Taveta. The species preferred by farmers are mainly Grevillea robusta and Cupressus lusitanica. In Taveta the practice of tree growing is to interplant them with crops mainly bananas.

3.0 Conclusions and Recommendations

Taita Taveta district especially in Ronge and Wundanyi regions has steep terrain which require special skills in harvesting. This has contributed to the whole district not having a single sawmill mainly due to constraints faced in harvesting. The demand of forest products especially lumber, is high and this is evident out of the large number of pitsawyers in the district. The methods for harvesting in these areas need to be conomical, environmentally acceptable and those which will not damage the soil.

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The visit reviewed the need for planning on harvesting techniques which will later be used during establishment of the plantation. More studies need to be conducted which will try out various techniques which could be used in harvesting. Such techniques would include plastic chutting, use of limited machinery in harvesting and potential of opening up the roads for harvesting purposes.