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The Status of Mangrove Exploitation and Trade along the Kenyan Coastline

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ABSTRACT

Exploitation of mangroves in Kenya is controlled by the Forest Department through the licensing of users and subsequent supervision of harvesting and removal of the produce. Marketing of the produce is undertaken by the licensees and individual traders; the department has a role through the issuance of movement permits. The state is the only stakeholder who invests in the conservation and management of forest resources in-spite of the benefits accruing to the other stakeholders. In view of this, there is need to look at ways of easing this burden from the government through decentralisation and devolution of some of the activities and powers respectively to the other stakeholders.

INTRODUCTION

Mangroves are highly valued for their richness in biodiversity and provide habitats for many species of fauna and flora. The resource contributes considerably to the local economy. Trade in mangrove products provides employment opportunities to many people: dhow transporters, vehicle transporters, cutters and sellers. Indirectly it contributes to employment in building industry, fishing, carpentry and hotel industry. Mangrove exploitation has existed

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Table 17.1 *Areas and locations of mangrove forest*

DISTRICT	LOCATION	AREA (ha)
Lamu	Lamu	30,475
	Kiunga	3,025
Tana River	Kipini	1,595
	Kilifi	820
	Mto Tana	250
Kilifi	Kilifi Creek	360
	Mida Creek	1,600
	Mto Fundisa	330
	Mto Kilifi	1,550
	Mtwapa Creek	525
	Ngomeni	1,815
	Takaungu	30
Mombasa	Mtwapa Creek	115
	Port Reitz	1,575
	Tudor Creek	1,465
Kwale	Funzi Bay	2,715
	Maftaha Bay	625
	Kwale	1,195
	Ras Mwachema	5
	Vanga	4,265
TOTAL		54,335

Source: Doute *et al.* (1981) quoted in Wass (1995).

for many years. Mangroves were exported to the Middle East since early this century. This export was banned in 1982 but there have been concerted efforts to have the ban lifted.

The estimated mangrove cover in Kenya is 54,335 ha (Table 17.1). Mangroves in Kenya are spread over six districts: Lamu, Tana River, Malindi, Kilifi, Mombasa and Kwale (Map 1: p.256) with Lamu making up about 68% of the resource cover as well as having the most productive stands.

During the colonial period at the turn of the century, mangrove poles were the major forest products exported from the coast region. They are still the main forest product. Recognising the importance of mangrove resource, the German administration in East Africa was the first to attempt to control the cutting of mangroves. The first forest management plan by Germans for Tanzania involved limitations for quantities to be cut for mangrove poles

and firewood. In order to improve quality of the mangrove forests, replanting of cleared areas and the replacement of lower quality trees with those of higher commercial value were undertaken. Successive governments in the region, both colonial and independent, have also been concerned with the management of the mangrove resource (Semesi & Howell undated).

G. A. Park, a forester stationed in Lamu between 1958 and 1968, is the first person reported to have attempted trials of replanting mangroves in Kenya. Other attempts to replant have been in Ramisi River, Mida Creek, Tsunza and Gazi. The latter constitutes the largest attempt and has also involved the local population.

Mangrove forests were gazetted in 1932 (Ferguson 1993) with some areas later being gazetted again as marine reserves like Mida Creek in 1968. Management of mangroves is done at local level. For example, Gede forest station manages all the mangrove formations south of Malindi while Jilore station manages all the mangrove formations north of Malindi. In each station there are forest guards and patrolmen who police to stop illegal activities, supervise the cutting and removal of mangrove products.

The state remains the main stakeholder who invests in the management of mangroves though the other stakeholders continue to benefit from the resource as well. Mechanisms to facilitate the implementation of collaborative partnerships in resource management are lacking. The current policy allows uni-sectoral management, which vests all the powers in the Forestry Department (FD). Kenya Wildlife Service (KWS) has management responsibilities in the marine parks and reserves (like Kiunga in Lamu and Watamu in Malindi) but all mangrove formations are gazetted forests whose management wholly rests with the FD.

Other stakeholders such as licensees, cutters, forest adjacent communities, the tourism industry, and non-governmental organisations have potential for management and are willing to do so. Organisations that should be involved in the management of mangroves include the Kenya Forestry Research Institute (KEFRI), Kenya Marine and Fisheries Research Institute (KMFRI), Coast Development Authority (CDA), National Museums of Kenya (NMK). Local and international bodies such as public universities, the United Nations Environment Programme (UNEP), United Nations Education, Social and Cultural Organisation (UNESCO) and International Union for the Conservation of Nature (IUCN) also should be involved. The combined capacity of these potential partners needs to be utilised to supplement the efforts of FD through collaborative partnerships in forest management. This will improve the management of the resource thus ensuring it provides multiple products to satisfy the many needs of the participating stakeholders.

The Forest Department is the government department authorised to co-ordinate the utilisation of forest products in gazetted forests like the mangroves. The utilisation procedure is through application of an annual licensee. The granting of the license and payment of the license fee gives the applicant the right to exploit the resource at specified quantities within a designated area for one year. Each licensee has cutters who know the area they are supposed to operate within. They are expected to cut and inform the licensee when they have finished whom in turn informs the FD. The numbers cut are counted, government fees paid and the poles are hammer marked. The licensee is free to move his materials on issuance of a movement permit. All mangrove products are for local use as there is a ban on the export of mangrove products since 1982.

METHOD

A survey on the status of mangrove exploitation and trade along the Kenyan coastline was done in 1997 using a semi-structured questionnaire and a checklist of issues to be covered with each category of interviewee. The interviewees were selected through random sampling. The questionnaires were supported by structured observations on the general state of the resource and the level of erosion in the mangrove swamps.

The interviewees were categorised as follows

- Licensees;
- Merchants;
- Users (local people for building houses and as fuelwood);
- Mangrove cutters;
- Government officers (FD, KMFRI and KWS).

The interview venues were chosen for the convenience of the respondents and they consisted of:

- Landings — where the poles are landed after cutting for counting and hammer marking by the FD;
- Selling yards — where the merchants display and sell the poles to the public;
- Offices — this involved the Government officers and the large-scale licensees;
- Mangrove forest — this involved wading through mud with the officers, fishermen and cutters. The survey tools consisted of a semi-structured questionnaire and structured observation;

- Households — from the forest adjacent communities whose main use of the mangroves is for fuelwood and house construction and who are also cutters.

Observations were used to categorise the districts as regards level of exploitation and the status of the mangrove forest and swamps. Secondary sources of data were consulted for purposes of comparison.

Results and Discussion

The exploitation of mangroves is difficult mainly because of the inaccessibility to the swamps where the trees are growing. This situation has also made supervision and monitoring of exploitation by FD staff difficult. This has made the cutter who has access to be the exploiter and the supervisor; the one to decide where and what to cut within the licensees' compartment. The officers come into contact with the poles at the landing bay. Since the cutter is paid as per the number of poles cut, temptations to over-exploit in zones with better trees are high, often resulting in bare swampy grounds which are prone to erosion.

The cutters range from subsistence ones; those who cut poles from forests within a walking distance from their houses to the mobile commercial cutters of Lamu. The latter own dhows and they are contracted by the licensees to cut poles from far-away islands. They are paid on delivery of the product at Mkowe jetty. This means that the cutters are the decisive factor in the exploitation of mangroves. Logistical difficulties make it impossible for the

Table 17.2
Official data on the number of scores extracted per district

	LAMU	KILIFI	KWALE
1990	16,164	3,190	41
1991	16,266	7,312	331
1992	12,712	10,047	135
1993	10,395	3,672	1,437
1994	7,087	5,355	1,945
1995	9,201	20,461	1,947
1996	9,467	4,072	1,073
AVERAGE	11,611	7,230	987

Source: FD annual reports.

FD to have reliable data on the number of trees cut in identified areas. Consequently, the department is not in a position to make decisions to close one area and shift the licensee to other blocks at the right time.

Over 90% of the licensees interviewed started trading in mangroves poles during the colonial era when it was easy to get the top classes of mangroves poles; *Banaa* (diameter at butt 20.1-35.0 cm) and *Magogo* (diameter >35.0 cm). Most of the licensees have their own timber selling yards where they sell their produce except in Lamu where all licensees except one sell their products to merchants and selling yards in Malindi, Kilifi, Mtwapa, Mombasa, Likoni and Ukunda.

There is both domestic and commercial use in mangroves. Domestic use is for construction of houses and as fuelwood. The demand for mangrove poles is high during the low tourism season when most tourist establishments are closed down for renovations. This is also the time most workers have for their holidays and they use this time for building or renovating their houses. There is also use of mangroves for cottage industries in Lamu, namely the burning of coral to make lime. The use of mangrove firewood by Kenya Calcium Factory to fire it's kilns has been replaced by coal from South Africa. Commercial use is for the construction of residential houses in the urban centres along the coastline. The mangrove forests in Malindi, Kilifi, Mombasa and Kwale can not meet the local demands for mangrove products. Lamu exports 95% of its mangrove poles to meet the deficit in the other coastal towns. Mombasa takes the largest share and small quantities are also sold as far as Likoni and Ukunda (Table 17.2).

The surplus in Lamu exists because there are few hotels, the low population densities of forest adjacent communities, the relative high cost of mangrove poles and abundance of land poles[3] that are cheaper. Most of the mangrove poles sold in Ukunda are from Tanzania which are sold as far north as Mombasa. Ukunda gets more than half it is requirements for mangrove products from Tanzania. These poles are in high demand because of their superior quality in that they are straight and much longer than the local ones. They reach the country illegally through Bodo and then they are disguised as poles harvested from the local forests.

The severity of erosion in the mangrove swamps, the extent and frequency of bare sites and the presence of mother plants were categorised in better, bad, worse and worst. Worst, the lowest score, was forest which had been seriously degraded, low frequency of mother

3 Commercial term used by the FD to refer to poles from indigenous terrestrial forest trees.

plants and very little materials for harvest. Mombasa had the worst score as it had the most degraded forests followed by Malindi and Kilifi. Kwale had the third score of bad and Lamu had the best score of better. Lamu had it swamps least eroded, mother plants were more frequent and it had trees which could be harvested at all the sites that were visited. Also it did not have any visibly over-cut areas. Tana River was not covered by the study.

These findings can be attributed to the distance from major consumers like in Mombasa, Malindi and Kilifi. The tourism industry in Malindi and high population densities offer a ready market for the poles which exerts pressure on the nearby mangrove forests. In Lamu it was the opposite in that the mangrove forests nearby were least exploited with the cutters decrying over exploitation in faraway islands like Faza and Ndau. This is attributed to lack of FD personnel and the distance from the Lamu forest station.

Erosion of the swamps is being caused by over-cutting in some areas where the cutters find the poles of the size they require. They know they are hardly supervised and that the officers lack the means to supervise. Though the FD has boats in Kilifi and Lamu, most of the time it did not have fuel or the pilot had retired like in Lamu under the civil service retrenchment programme. The other districts do not even have a canoe. If they want to supervise they have to rely on the goodwill of the cutters to provide them with their canoes or dhows. In areas like Mombasa the bare sites as a result of mangroves dying due to pollution and siltation.

Customers preference for the most utilised species is as follows: *Rhizophora mucronata, Ceriops tagal* and *Bruguiera gymnorrhiza* (Mbuvi, Luvanda & Wandabwe 1997). In some areas *R. mucronata* has been over cut and the licensees are now turning to *C. tagal*. This is having an impact on the species composition of the mangrove formations. This is evident in Ndogo Kundu area of Mida creek where *R. mucronata* is being replaced by *C. tagal* which regenerates faster than the former (field observation). Lamu exports mostly *R. mucronata* to the other areas of the coastline while the other species are used locally (Mbuvi *et al.* 1997).

Sustainable Management

There are various indications that the resource is not being sustainably managed. Among these indicators are the following:

- The absence of large size classes poles like *banaa* (20.1-35.0 cm) and *magogo* (13.1-20.0 cm). These classes are not recorded anymore by the FD as being harvested these

days. The cutters reported that they are only to be found in Lamu after a long search;

- Ban on the cutting of *fitos* (size class less then 4 cm diameter at butt). This is a measure to enable the resource to recover. With sustainable harvesting it would not be necessary to ban the cutting of one size of mangroves since each class would be removed in quantities that leave enough stock to grow to the subsequent size classes;
- The illegal importation of better quality poles from Tanzania which are in high demand in the construction industry because of their superior quality. All the straight long poles with few knots in selling yards on the south coast are from Tanzania;
- The evident erosion within the mangrove swamps. This was less the case in Lamu but visible in Kurawa, islands in Kilifi Creek and also within the mangrove formation on the south coast;
- The cutters report that it now takes much longer to cut the same number of scores than it took about twenty years ago;
- The short and crooked poles with multiple knots that are being cut from the forests against customer demand for straight and long poles;
- Encroachment by developers, fish farms and salt farms on mangrove stands and pollution from industries and hotels.

Management Problems

The stakeholders cited several difficulties that hinder their efforts towards attaining sustainable utilisation and management of the mangrove resource. They are listed below without further comment:

- Lack of inventory data;
- Lack of involvement of other stakeholders;
- In-appropriate policy;
- Lack of management plans;
- Insufficient resources of personnel, motor boats and vehicles;
- High licensee fees;
- High transport costs;
- Lack of involvement in the management of the resource;
- Low morale among staff;
- Inadequate knowledge on mangrove silviculture;
- Areas of double gazettement are a source of conflict between KWS and FD;

- Illegal mangrove cutting;
- Tourism industry mostly jetties;
- Illegal allocation of mangrove forest areas to developers;
- Salt farming.

CONCLUSION

Inventory and re-surveying of the mangrove area are necessary. This will enable managers to draw appropriate management plans. The inventory data will enable them set sustainable quotas that allow only pole off take limits that do not affect the forest regeneration. It will enable the planners to allocate adequate resources towards the management of the mangrove resource. For example, the Kilifi District master plan for the period 1995–2020 (Kenya 1994) gives mangroves minimal recognition though it is a major revenue earner in the district. Lamu district has the highest mangrove cover but it has only one forester for the whole area. This makes the monitoring of legal and the policing of illegal activities difficult considering that most areas are only accessible by boats and dhows (Kahuki 1993).

Policy changes should aim to facilitate management through the involvement of other stakeholders like the Fisheries Department, forest adjacent community, KWS, NGO's, the tourism industry etc. FD should push for the new policy to be approved and start involving other stakeholders in the management and utilisation of the forest resource. Awareness and training programmes should be held involving all stakeholders. Awareness training should not leave out the government officers. Training should be aimed at imparting skills of advocacy, as well as how to built effective alliances and collaborative partnerships.

The stakeholders should facilitate mangrove growing on-farm considering that water and cost of seedlings remains a major hurdle for the poor members of the community. These households form the majority in the region and they have to be involved if illegal activities are to be reduced. The FD should strictly follow a compartment felling system while at the same time taking a lead in facilitating and co-ordinating the replanting of mangroves.

The local peoples' illegal use of the mangrove resource is attributed to poverty within the community. This can be alleviated through facilitating the community to start other income generating activities like fish farming, bee farming etc. Village based licensees should be allowed to cater for the needs of the community members who have to incur extra cost tracing the urban-based licensees.

The current system where the cutter is the patrolman of the mangrove forest should be supplemented by the FD with its own patrols. This is only feasible if the department is strengthened in terms of personnel and other resources. Quotas allocated to each licensee should be adhered to and they should set the number of specific species to be removed in each block. This will prevent over-cutting of individual species. For example, in Mida, *C. tagal* is replacing *R. mucronata* because the latter has been over cut to satisfy the customers' demand and preference and because the former is a faster coloniser. Quotas for such an area should not include such over utilised species. This will maintain the natural composition of the mangrove forests and retain the associated flora and fauna.

Research will need to be properly co-ordinated and a working group formed in view of the importance of this resource. Conflicts of interest between for example KWS and FD should be resolved in an open and transparent manner before they spill over to the licensees, the forest adjacent communities and developers. The policy should also be clear as to which prevails in case of double gazettement. It should make it clear how to handle the management of mangroves in areas where private developers have title deeds to the mangrove forests as is the case with the salt farms. Allocation of mangrove forest should be stopped.

All development adjacent to mangrove areas should be allowed only after an environmental impact assessment has been carried out and after it is confirmed that the development will not have a negative impact on the mangrove ecosystem.

Concluding there was a general feeling among the managers and other stakeholders that exportation of the mangroves should not be allowed. The ban should not be lifted as the resource is insufficient to meet local consumption. There is an absence of authoritative inventory data, and a shortage of the mangrove materials in all the coast districts except Lamu .

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