TRADITIONAL USES OF MANGROVE RESOURCES IN THE CENTRAL PROVINCE

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INTRODUCTION

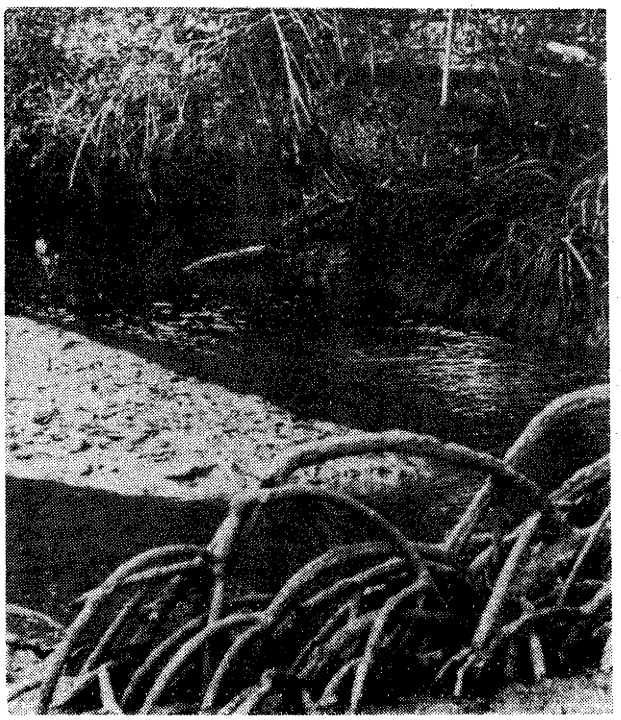
At the end of 1983 the Marine Section of the Forest Products Research Centre started a project to collect information on the traditional uses of mangrove resources. This article is a summary of the information collected so far for Central Province. The project aims eventually to gather data from all the mangrove areas in Papua New Guinea.

The project is being carried out because, with the introduction of Western technology and education, the use of traditional technology and natural products has decreased. Unless information about traditional crafts and practices is collected and recorded, it will be lost.

MANGROVES

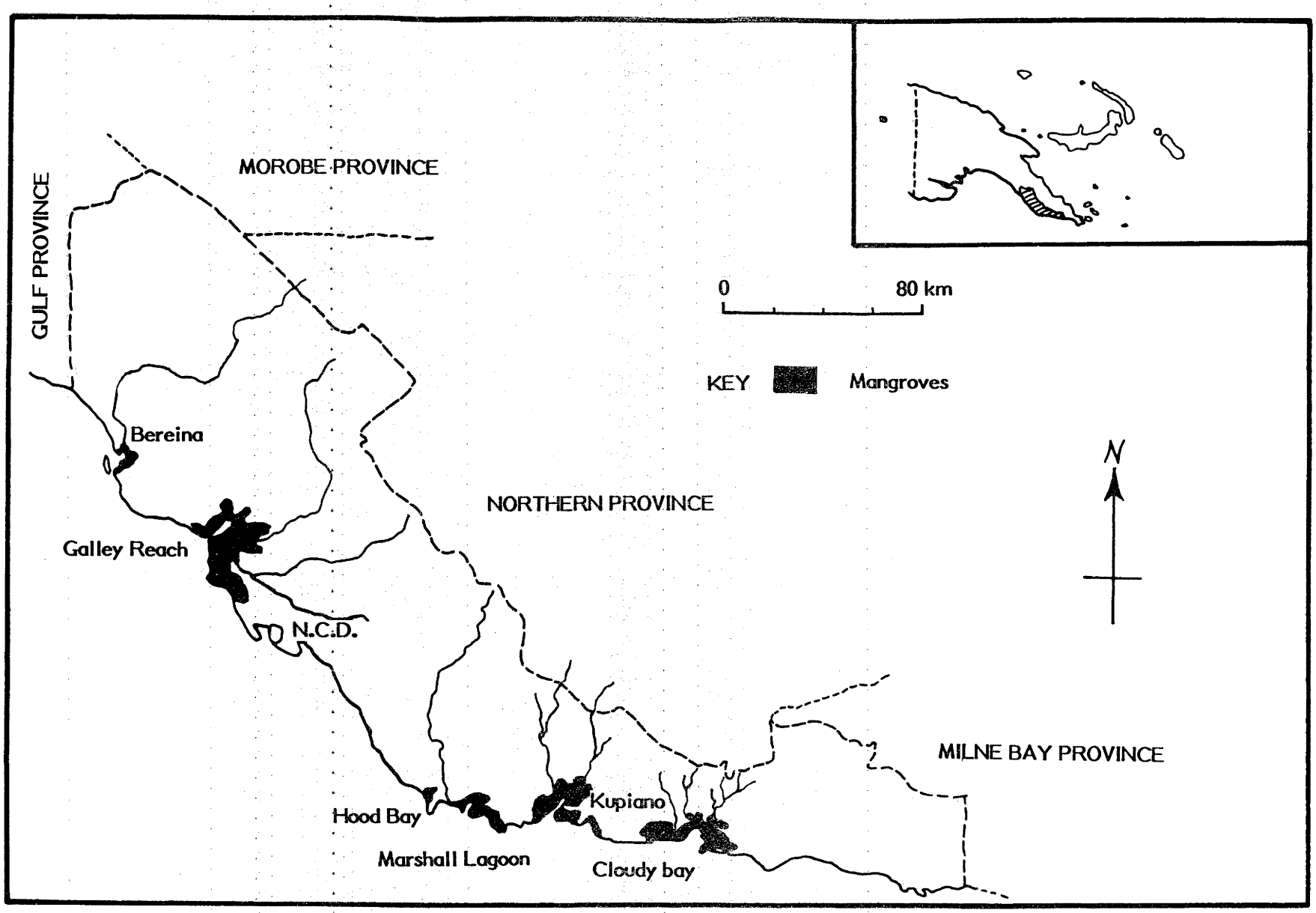
Mangroves are the special type of vegetation found in the coastal tidal zones. The word 'mangrove' covers many different species of trees and shrubs; however all mangroves are specially adapted to grow in tidal, salt-water conditions. The species found in any particular area vary with soil type, climate, slope of the land, salinity (saltiness) of the water, tides and drainage. Mangrove species grow tallest where the soil is made up of sediment washed down from rivers, which is exposed to the air every day at low tide. (See Paijmans, 1976).

The total area of mangroves in the Central Province has been estimated to be just under 60,000 hectares. This estimate does not include the small strips all along the coastline. The main areas of mangrove are shown in the map on page 6. (See Paijmans, 1973).



A mangrove area, showing typical 'prop' roots of Rhizophora *spp.*

The mangrove genus Bruguiera *which is 'buttress'-shaped at the base of the trunk*



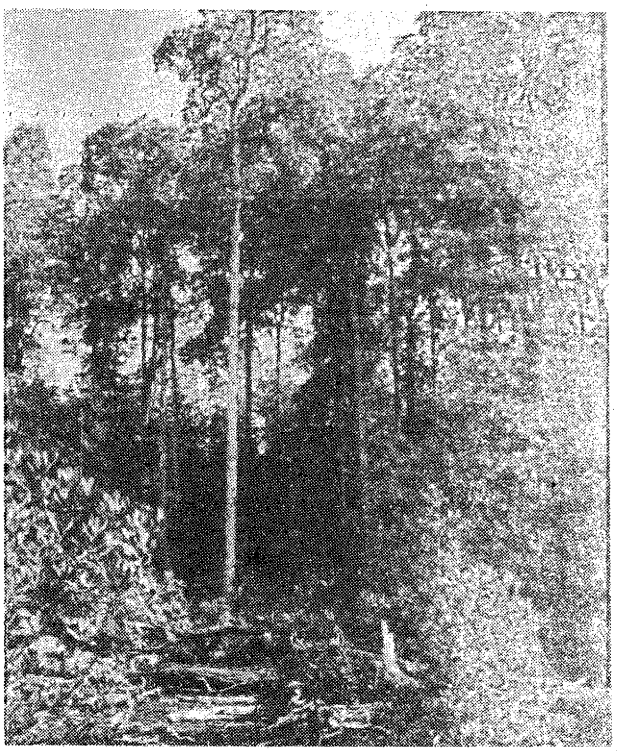
Central Province: The main mangrove areas

Mangrove ecosystems in the past and at present play an important role in the lives of the coastal population of the Central Province. By 'ecosystem' we mean all the plants, animals, soils, waterways, etc. that together make up the mangrove area. About 36% of the total population of the province (see National Population Census, 1980) use the natural resources of mangroves.

COLLECTING THE INFORMATION

We collected the information by:

- Visiting some local villages and interviewing the elders
- Carrying out a 2-week survey of markets in Port Moresby to find out where the mangrove resources came from and how much they are worth.



Bruguiera *spp. The tall straight trunks make it very good for construction purposes*

RESOURCES AND THEIR USES

Firewood

Some mangrove woods make excellent firewood. Mangrove wood is often preferred to other species because it burns better, giving off more heat and producing less smoke and ash. In some Motuan villages, stands of mangroves have been completely cut down for firewood.

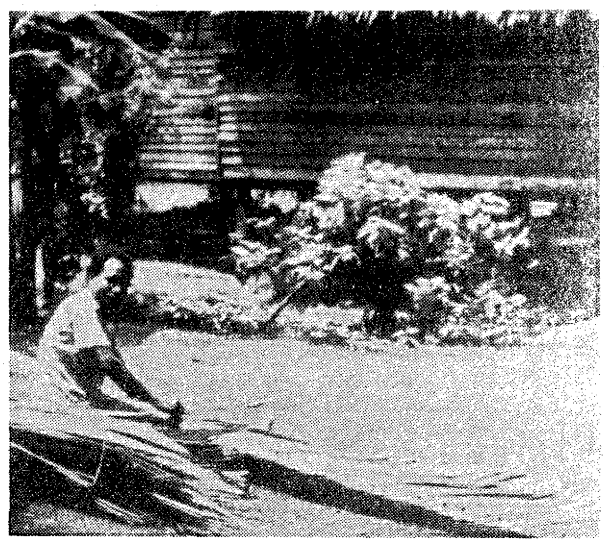
Species commomly used for firewood include *Ceriops* spp., *Rhizophora* spp. and *Avicennia marina*.

Construction

Mangrove woods are widely used for making houses, fencing and canoes along the whole coast of the Central Province. Before there were any good roads in the province, the villagers transported logs from all the main mangrove areas by canoe or by bamboo raft, to build their houses. The Motuans continue to use mangrove wood for construction purposes today.

The species most commonly used for building are *Rhizophora apiculata, R. stylosa, R. mucronata, Bruguiera gymnorhiza* and *B. sexangula*. Most of these species are common throughout the province. They are specially good for construction purposes because the wood is strong and long lasting; and the trees grow fairly straight without much secondary branching. Under good conditions they can grow to over 30 m high. (See Paijmans, 1975).

The leaves from nypa palm (*Nypa fruticans*), a palm which is common in mangrove areas, are used for thatching the roofs and walls of houses.



This woman is weaving nypa fronds for roof thatching

A typical village in a mangrove area. All the materials used in building the houses are mangrove products

Food and drink

Mangrove ecosystems provide suitable habitats (places to live) for many animals which are important sources of protein for local people. Sometimes the mangrove areas may be the only source of protein.

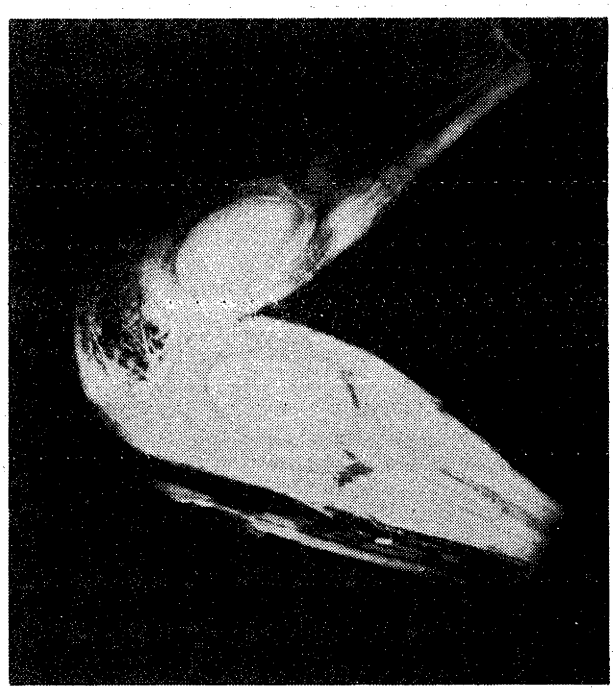
The estuaries, rivers and creeks within the mangrove forests provide rich and easy fishing grounds. Large numbers of fish, several prawn species and some bivalves (e.g. the cockle - *Anadara granosa*) are found.

The mud crab, *Scylla serrata*, occurs in mangrove forests and is commonly eaten. The bivalve shell fish, *Geloina coaxans*, which lives in the soft mud in the mangroves is also eaten by many people. Along the western coast of the Central Province, the shells of *G. coaxans* are used to make the lime used when chewing betelnut. Another crab species, *Cardisoma carnifex*, found around the very high water mark, is a delicacy along the whole coast.

Trading of the foods found in mangrove areas (e.g. smoked fish, shellfish, crabs, salt) for garden foods like bananas, taro, sweet potato, yams as well as betelnut and mustard, used to be very common. This type of bartering has decreased over the years as the villages have become involved with the cash economy. However, the barter system is still used in many areas. In some parts of the Central Province, gardens in the coastal areas give such low yields that villagers rely totally on the exchange system for their vegetable supply. This is especially true during drought and flood periods.

Various parts of certain mangrove species can be eaten, but are minor foods only, for example:

- Children eat the base of young shoots of *Nypa fruticans*. They drink the water in the young nuts and eat the flesh of the nuts.



A young nypa fruit split open to show the flesh of the nut inside

- Roro children from the Kairuku area chew the flowers and soft young stems of *Avicennia marina* with very young coconuts, in play. Chewing the mixture gives them red lips as in betelnut chewing!

- In villages opposite Yule Island, youngsters, especially teenage girls, eat the young shoots of *Rhizophora stylosa*, when they are out collecting firewood, etc. from the mangroves.

The only mangrove species which provides an important food is *Bruguiera gymnorhiza*. In some villages in the Marshall Lagoon area, the hypocotyls (sprouting fruits) are used as a staple. In the local language the food is called Kavela.

Method for preparing Kavela

1. *Collect mature hypocotyls from the trees of Bruguiera gymnorhiza, and also those which have fallen to the ground, if they are still fresh.*

2. *Boil the hypocotyls for about 1 hour until they are cooked.*

3. *Peel and shred the hypocotyls.*

4. *Pack the shredded hypocotyls in coconut or nypa leaf baskets and suspend them in the sea water for 3-4 hours. This soaking softens the hypocotyls and probably helps to get rid of some of the tannins.*

5. *After the soaking, the shredded hypocotyls are ready for cooking and eating. Cook them by boiling in fresh water or with coconut oil for 30-45 minutes. Normally Kavela is eaten with some sort of protein, e.g. fish.*

Medicinal purposes

A number of mangrove species can be used to treat various ailments. Traditionally, knowledge about medicinal plants is regarded as personal or family property; villagers are reluctant to pass the information on to anyone outside their family. They fear you might give their valuable information to enemies who might use it against them. Hence it is difficult to get information on medicinal uses of mangroves.

Information was given on a few commonly used mangrove species:

- Villagers around Bereina chew the roots of *Avicennia marina* and place the chewed roots on minor fish stings to stop pain and swelling.

- The young bark of *Lumnitzera racemosa* is chewed with very young betelnut by women who want to be sterilized.

- In the Marshall Lagoon area, boiled *A. marina* leaves are placed on sprained ankles to ease the pain.

Recreation and transport

The sheltered rivers and creeks in the mangrove forests are used for the main forms of recreation - fishing and swimming. The waterways are used as 'roads' for paddling to gardens, visiting neighbouring villages, transporting logs and so on.

The mangroves also provide sheltered mooring for canoes during bad weather. During long sea voyages (e.g the Hiri trade journeys), the canoes always went into the estuaries and rivers in mangrove areas to avoid bad weather and to avoid damage to the goods they were carrying.

Clothing

The young shoots of the nypa palm are used for making grass skirts for women. Before Western clothes were common, women along the whole coast of Central Province wore these skirts.

Fibres from the rib of the nypa fronds are woven to make arm bands.

Tools and weapons

Traditional tools made from mangrove woods include digging sticks, coconut peelers and spears. Young, straight

Bruguiera gymnorhiza trees are used for poling and anchoring canoes. They are also used to hold down nets in the sea.

Shells of *Geloina coaxans* are used to peel vegetables such as bananas and yams, and to scrape coconuts. The shells of *Mytilus* sp. are used in preparing the hypocotyls of *B. gymnorhiza.*

Dyes

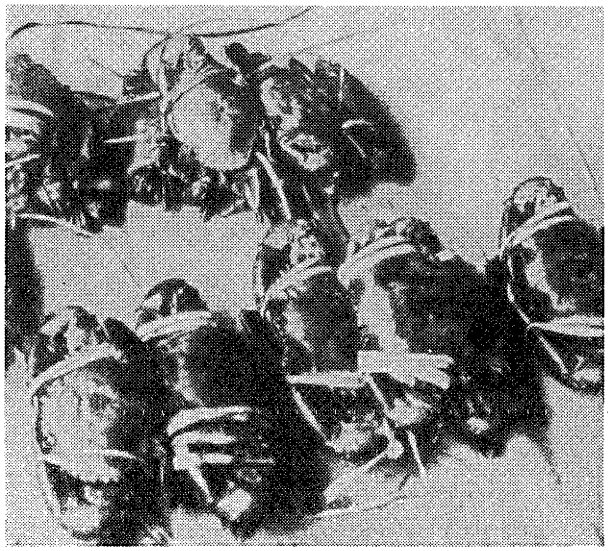
Tannins from the bark of green *Xylocarpus* used to be used to dye grass skirts and bark cloth (tapa) a maroon (dark red) colour. The bark was beaten to a pulp, then placed in water. The tapa and grass skirts were soaked in this water overnight, or until the desired colour was obtained. Occasionally the barks of *Rhizophora* spp. and *Bruguiera* spp. were used for this purpose.

Source of income

A major way for coastal villages to earn cash is by selling fish, crabs and shellfish. Lime made from the shells of *G. coaxans* is also sold in large quantities in markets in Port Moresby. Our survey of Port Moresby markets showed that the main suppliers of fish, shellfish, crabs and lime are from Hood Lagoon and Galley Reach. People from Hall Sound Bay and Marshall Lagoon come to the markets less often. Although Cloudy Bay has the largest mangrove area in Central Province, there are no road links to Port Moresby, so the resources are used locally only.

A lime seller at Gordons Market, Port Moresby

Sellers were found to each earn between K10 and K90 per day from the sale of the resources mentioned above. Mud crabs sell the best with the price varying from 20t to K5.00 per crab. The price depends on the size, sex (females cost more than males) and demand at the time of selling.



Mud crabs on sale at Gordons Market, Port Moresby

Cash earned from selling in the markets is used to buy items like rice, tea, sugar, tinned fish and meat, and clothes. It also goes towards school fees, fares, buying outboard motors and buses.

For some people this is the only way they have to support their families. For example, the Gulf Province squatters around Galley Reach depend entirely upon money from selling crabs and shellfish. They cannot make gardens because they do not own any land.

Miscellaneous uses

Other uses of mangrove resources include:

- Use of leaves of *Heriteria littoralis* to roll tobacco

- The Roro people in the Kairuku area cut rings out of the legs of the crab *C. carnifex* and put them on the earlobes by making one crack in the ring. The shell gradually pierces the earlobes. This is an easy and painless way of piercing the ears.

- *A. granosa* shells were used as weights on small gill nets.

- Before the introduction of scissors and glass, shells of *G. coaxans* and *Batissa violacea* were used to shave hair.

- Green branches of *Excoecaria agallocha* are burned to produce fine soot which is collected on the bottom of cooking pots. The soot is used for tattooing girls.

CONCLUSIONS AND RECOMMENDATIONS

Mangrove ecosystems are very important in the lives of people who live along the coast of the Central Province. Some mangrove resources (fish, mud crabs) are becoming increasingly important as a source of income for village people. So there is a need to make sure that the mangrove ecosystems are protected and conserved.

People living around the mangroves should be made aware of the importance of the mangrove ecosystem as a whole. They should be helped to understand how large scale use of mangroves, such as logging, could affect their lives.

Important and useful traditional uses of mangroves could be introduced to other parts of Papua New Guinea. For example, the method of cooking and eating the hypocotyls of *B. gymnorhiza* could be introduced to people living in major mangrove areas where the main energy food is sago. This could help towards good nutrition, as *B. gymnorhiza* hypocotyls contain more protein than sago.

At present, mangrove resources are used only by local people who live close to the mangrove forest. However, some of these resources will become more important in the future. For example, the prawn and barramundi fisheries in the Gulf and Western provinces could be expanded to bring in more money for the country. When the demand for electricity increases as the population increases, a cheaper alternative fuel for low income earners would be high quality charcoal, mass-produced from mangrove wood.

Aquaculture could become important to satisfy an increasing demand for fish in both urban and rural areas. With the expertise of modern science, traditional medicinal plants could provide possible cures for some diseases that affect man today.

There is a vast amount of traditional knowledge on plants and animals. Collecting and recording this information will provide a useful source of data for researchers. Since Papua New Guinea is a developing country, it lacks skilled manpower to use modern technology. Projects like ours collect information which can be used in the development of techniques which are approriate for use by village people.

FURTHER READING

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