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Fishing

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Fishing

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INTRODUCTION

This report describes and analyzes the fishing activities of the Galela people. The research on which it is based focused on the following topics:

1. Varieties of fishing gear and fishing techniques and their mutual relevance; and
2. the quantities and type of canoes owned and their use in fishing.

Research for the first topic was done by observing the fishing techniques employed and then investigating the gear used. An exhaustive house-by-house inventory of fishing gear was made, and the frequency of fishing, the kinds of tackle used, and, with the cooperation of 6 villagers, the numbers of fish caught during 1 week in October and another in November were investigated statistically. Research for the second topic proceeded by first checking the number of each type of canoe belonging to the villagers and then investigating how different canoes was actually used in fishing.

All interviews were conducted in Indonesian and Galela words were used to record names of fish, fishing gear and techniques used. The Galela transcription is based on current Indonesian orthography.

I. FISHING ACTIVITIES

1. Overview

Fish and shellfish are important sources of animal protein for the Limau villagers.¹⁾ Except when seeking specific migratory fish, Galelans fish almost exclusively

1) It is generally believed by the villagers that women should not take part in fishing activities, because they are thought to be stained by menstruation. However, only women and children go to the river to gather shellfish.

in the shallower, inshore waters. They regard fishing for the market as unthinkable, fish being nothing but "empty stomach fillers", and just enough fish for the day's food is all they require. This makes distant fishing unnecessary. The fact has had corresponding influence on the gear and techniques employed.

Fishing techniques: The Galela people employ relatively few varieties of fishing techniques, and all are primitive and small-scale. Their techniques may be divided into three major categories: Line fishing (*pa hau*), net fishing (*pa soma*) and spear fishing (*pa tudu*). One or two villagers also occasionally practice hedge fishing (*sero*) and trapfishing (*igi*). Dive fishing (*putun*) has also been handed-down to the present generation, but diving for fish is no longer practised.

Those three main fishing techniques can be further sub-divided. Line fishing, for instance, can be sub-classified into handline fishing (*pa hau*), rod-and-line fishing (*pa totobe*) and longline fishing (*pa lia*); net fishing into scoop-net fishing (*pa siu*) and gill-net fishing (*pa some bodo*). But line fishing is a year-round activity and is the most representative fishing technique, the rest being used only during particular seasons. Scoop net fishing is used only seasonally to catch specific migratory fish, sometimes far out at sea. Line fishing is probably the most popular technique since anyone can fish with the minimum of gear, a simple fishing line (*nilon*) and a hook (*gumala*) being all that is required. And since their purpose is just to catch "fish enough for the day's food," Limau villagers probably would never even think of using sophisticated gear.

It is not clear whether trap fishing and hedge fishing are originally Galelan techniques. If the information provided by informants is reliable it seems that these techniques are a relatively recent introduction, some people saying that "strangers brought them here." Additional evidence for this may be that only a few villagers, all in-migrants from other areas, are known to practice these techniques. One of the outstanding characteristics of the community in Limau is the great mobility of people (see Matsuzawa, this volume, pp. 368-372), hence it is quite easy to envisage a connection between this mobility and some aspects of Galela fishing activities. For example, the villager who owns a trap net is an in-migrant from Sangir, in North Sulawesi, and the one who practiced hedge-fishing is an in-migrant from Maba, in Central Halmahera. Furthermore, many of the villagers who had relatively many articles of fishing gear were in-migrants. A significant number of the types of fishing gear and techniques used in Limau have been introduced from outside. But not every article of fishing gear or technique introduced by in-migrants is accepted and adopted by the villagers. This might result from their regarding fishing as just a minor means of obtaining side dishes, and that using sophisticated tackle and techniques are not attractive enough to replace their simple but handy methods. This may partly account for the fact that the Galela have not readily adopted the fish trap, which is too complicated, or a fish hedge, the setting-up of which is a laborious task.

Fishing gear Needless to say fishing gear and fishing techniques are closely related. Limau is no exception; corresponding to line, net and spear fishing are, respectively, line fishing tackle, nets and spears. Most villagers who fish own fishing

lines and fishhooks. Thus, from the viewpoint of tackle, line fishing is the most representative of all the fishing techniques practiced by the villagers. Other gear like gill nets, scoop nets, spears, harpoons, fish traps and fish hedges are far fewer in number compared with lines and hooks; only one villager owns a fish trap, for example.

Fishing grounds: Unless seeking particular, seasonally migratory fish, the Limau villagers' operational grounds are generally limited to the coastal waters in the sight of the shore (Fig. 1). Although the main area of their operations is within 1 km of the coast, this does not necessarily mean that they never fish outside this area, such as when they fish 3–4 km from the coast, or near the R. Gilitopa for collecting shellfish.

Their fishing ground appears to be a gently sloping shelf lacking biologically rich coral islands or reefs. The water depth (Fig. 1) is based on the information provided by the villagers together with my own approximate measurements, made with a length of a fishing line. The villagers lack sophisticated instruments for measuring water depth, and those few interested in finding out the water depth measure it by approximate means that I used. To the Galelans it is more important to know where fish can be caught rather than to know the depth of water in a particular place.

Generally, Galelans use traditional units of measurement to express length, and the metric system is seldom used. A fish, for example, is said to be "big up to the wrist" or "big up to the elbow." "Big up to the wrist" means "from the fingertip up to the wrist." Similar measurement are used to express the size of nets and water depth.

The *depa* is used to express water depth and the linear measurement of objects. *Depa* is an Indonesian word, and 1 *depa* equals the length of two outstretched arms, approximately 1.6 m. To express the water depth of 20 m, for instance, Galelans would say that it is about 12 *depa*.

Besides the indication of the water depth, Fig. 1 shows three distance areas, A, B and C, each of which gives a tentative idea of the fishing technique actually used there. Line fishing for instance, the major fishing technique employed, is central to B and C,

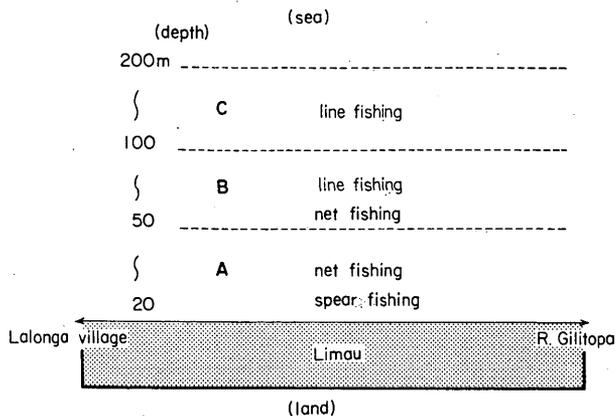


Fig. 1. Outline of the fishing grounds exploited by Limau villagers.

the latter being almost exclusively fished in this way. The centrality of line fishing is also seen in the case of fishing in areas other than those indicated in Fig. 1. But in area B, on the other hand, net fishing takes place. The area closest to the coast, area A, is mainly exploited by spearing and net fishing.

Obviously the Limau villagers employ different fishing techniques in different areas, but this is not meant to imply that they have any clear-cut idea about these separate fishing areas, these being simply my own classificatory labels. It might be imagined that they use different names to indicate different fishing areas, since they use various names for a rich fishing ground, such as *o nawo madoku* (: *nawo*=fish, and *madoku*=a strip of rocks or coral near the surface of the body of water) or *teto madoku* (the place between *madoku*) or *makale* (the sloping sea bottom), but the data available do not permit even a guess.

One of the important factors that defines good line fishing is the locations of one's relative position in a large fishing area. Galelans seem to use at least on-shore landmarks to locate themselves at sea via a simple form of triangulation. The choice of reference points seems to vary from person-to-person, but apparently stars are used at night.

Fishing seasons and fishes caught: The climate of Halmahera can be divided into two seasons: *O kore sara* (June-October), with little rain and a south wind, and *o kore mie* (December-April), which is relatively rainy and characterized by a north wind. The former is the dry season and the latter is the rainy season, and the months April-May and November-December are transitional periods. But the distinction of dry versus rainy is based less on the amount of rain and more on wind direction.

The representative fishes caught during *o kore mie* include *supado* (*Rastrelliger* sp.), and *ngawaro* (*Hemirhamphus* sp.). The north wind begins to blow in this season, and it rains almost every day. Consequently, the villagers say that the R. Gilitopa discharges a large volume of turbid water which drives the fish away from the coastal waters and makes fishing in this area impossible. But at the same time the north wind brings schools of the seasonally migratory fish, *ngawaro*, into Galela Bay. There fish are best caught in a scoop net from a large canoe (*pakata*) used for this purpose. Few villagers possess a scoop net and only 3 men in Limau own both a scoop net and *pakata*. Scoop net fishing, when practiced in the coastal waters during *o kore mie* to catch *ngawaro*, is always done together with the people from the neighboring village of Lalonga. Some Limau villagers catch *ngawaro* further south when the fish begin migrating southward off Halmahera during the *o kore sara*.

The season of *o kore sara* yields such fish as *bobara* (*Alectis ciliaris*), *make* (*Spratelloides japonicus*), *toni* (*Parexocoetus* sp.), *cion* (*Caesio erythrogaster*). But the seasonal migratory fish, *leanga*, (*Euthynnus affinis yaito*) is taken in the greatest numbers. *Leanga* and *ngawaro* are the two main fishes caught in the coastal waters off Limau. *Leanga* are caught either by the handline or the longline. This season also brings schools of migratory fish along the shoreline, making the area closest to the land (A, Fig. 1) the center of spear fishing activities. On rare occasions villagers fish with a floating gill net. Fish are sometimes caught with a fish

hedge (*sero*) or a fish trap (*igi*), both of which are used mainly in freshwater, and each of which are possessed by only one villager. During the period of our investigation *sero* was used only once, and *igi* not at all. According to our informant these types of fishing are not traditional. The owners of both items of gear were in-migrants from North Sulawesi, and it appears that neither the fish hedge nor the fish trap have been used for long in Limau.

Most fish caught are consumed as family food, and only a small quantity, particularly of *ngawaro* and *leanga*, are smoked and sold at the weekly market in Soasio.

2. Fishing techniques in Limau

1) LINE FISHING (*pa hau*)²⁾

Line fishing may be conveniently divided into the three types: Handline, rod-and-line and longline. Rod-and-line fishing is seldom practised and everyday fishing is done with the handline (Photo. 1) and the longline (Photo. 2).

Generally, villagers go fishing twice a day; in the early morning at about 4-5 a.m. (*i langi langi*) with the operating hours sometimes extending to 10 a.m., and in the cool evening hours, about 5-7 p.m. (*i mada mada*). Allowing for individual variation, men fish once every 2-3 days. Many species of fish are caught by line fishing.

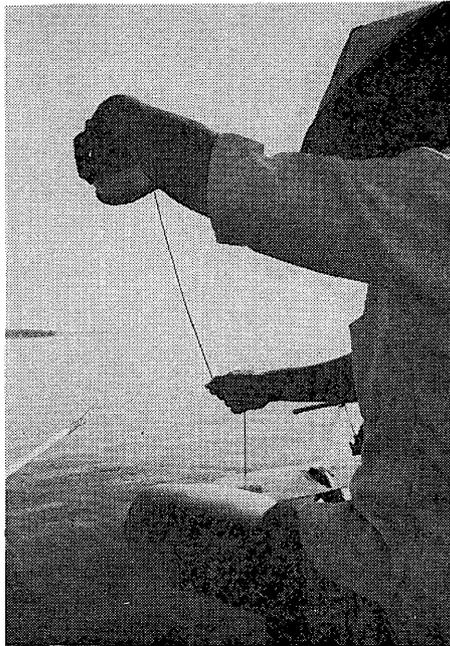


Photo. 1. Handline fishing (*pa hau*).

2) "*hau*" means "to catch fish with a line" in Galela but the villagers apply this word to fishing in general. The author applies "*pa hau*" as the translation of "line fishing" in this paper.

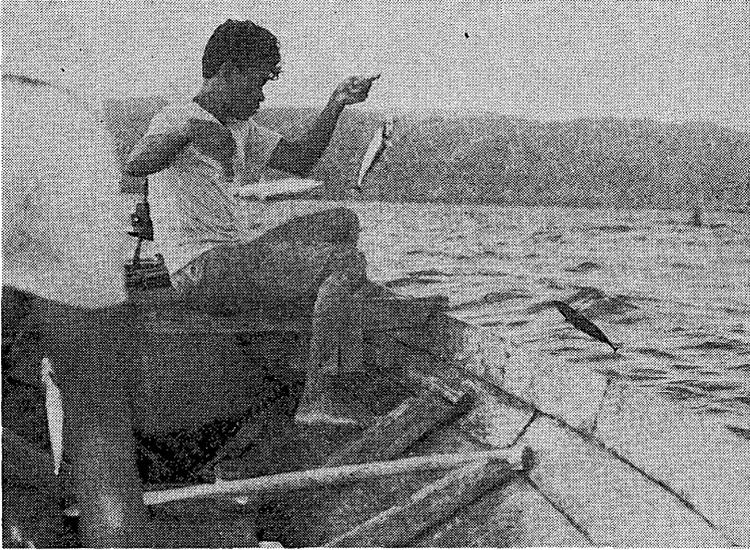


Photo. 2. Longline fishing (*pa lia*): Catching *leanga*.



Photo. 3. Making a lure (*lau*).

I observed 35 species caught by line fishing, of which 19 were purposely caught with the handline. This, of course, does not preclude the possibility of some fish being caught by the rod-and-line or the longline. *Leanga* was the most numerous among the 35 species, of which I could identify 18 (Table 1). One fishing trip will sometimes

Table 1. Fish catch and fishing technique

Galela	Indonesian	Zoological identification	line fishing			nets		spear	hedge	trap
			A	B	C	D	E			
<i>bobara</i>	bobara	<i>Alectis ciliaris</i> (Bloch)	○					○		
<i>baramahe</i>	selar	<i>Caranx</i> sp.	○							
<i>lasi</i>	talang ²	<i>Chorinemus</i> sp.					○	○		
<i>suru</i>	sunglir	<i>Elagatis bipinnulatus</i> (Quoy et Gaimard)	○					○		
<i>ngangadike</i>		<i>Priacanthus</i> sp.	○							
<i>toni</i>	ikan terbang	<i>Parexocoetus</i> sp.				○		○		
<i>ruo</i>	gerita	<i>Mugil cephalus</i> L.					○	○		
<i>leanga</i>	tongkol	<i>Euthynnus affinis yaito</i> (kishinouye)	○		○					
<i>tolouro</i>		<i>Thunnus alalunga</i> (Bonnaterre)	○				○			
<i>ido</i>	cakalang	<i>Katsuwonus pelamis</i> L.					○	○		
<i>supado</i>	kembung	<i>Rastrelliger</i> sp.	○							
<i>ngongare</i>	sunian	<i>Nemipterus</i> sp.	○	○						
<i>kusese</i>	tato	<i>Balistes</i> sp.	○	○						
<i>gorobe</i>		<i>Paracaesio kusakarii</i> Abe	○							
<i>dolosi</i>	pisang ²	<i>Caesio</i> sp.	○							
<i>cion</i>	ekor kuning	<i>Caesio erythrogaster</i> C. & V.	○				○			
<i>nyowa</i>	nyowa	<i>Dasyatis</i> sp.						○		
<i>ngawaro</i>		<i>Hemirhamphus</i> sp.				○				
<i>sapilada</i>	todak	<i>Xiphias gladius</i> L.	○							
<i>make</i>		<i>Spratelloides japonicus</i> (Houttuyn)	○							
<i>gasango</i>	golago	<i>Sphyrna zygaena</i> L.	○	○				○		
<i>lodi</i>		<i>Plectropoma maculatum</i> (Bloch)	○							
<i>lebo</i>		<i>Ophicephalus</i> sp.							○	○
<i>goodo</i>		<i>Anguilla</i> sp.								○
<i>gegete</i>		<i>Anabas</i> sp.						○		
<i>udi</i>	cumi ²	<i>Loligo</i> sp.	○							
<i>udi teto</i>	cumi ²	<i>Loligo</i> sp.	○							
<i>sakiloro</i>		<i>Penaeus</i> sp.						○		

Notes: A=handline B=rod-and-line C=longline D=scoop net E=floating gill net

yield 50–60 *leanga*, the migratory fish of *o kore sara*. They are caught with either the hand-line or the longline, which requires only a fishhook and a length of nylon fishing line. For the longline, however, a special lure (*lau*) is also used (Photo. 3-4).

The traditional lure was made formerly by inserting a small piece of chicken feather into a small hole (*ma kope*) in a fishhook (*gumala*) and then it was bent at the bottom of the shaft and tied with a thin cotton thread. The feather was cut

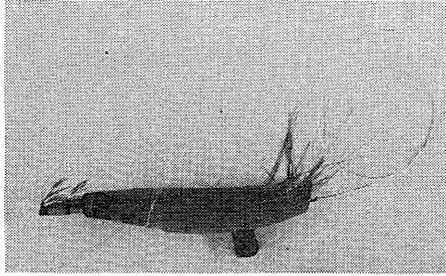


Photo. 4. Lure (*lau*).

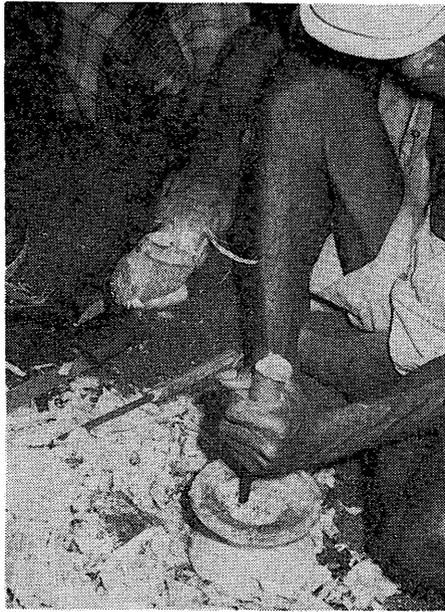
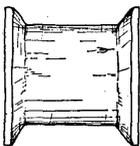
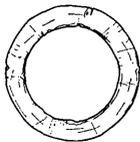


Photo. 5. Making a reel (*babalin*).



0 5cm

Fig. 2. Reel (*babalin*) made of *ngolola* (*Erythria* sp.) wood. This figure is drawn from Photo. 5. The reel was made by a villager while we were staying in Limau. It took nearly two hours to make it.

longer than the fishhook. But today people often substitute the nylon line (*fuya*) used for packing instead of the chicken feather for the lure. A lure is then fixed every 10–40 cm to a nylon fishing line, which is usually about 100 m long. The line is wound by a reel (*babalin*) (Photo. 5 and Fig. 2).

All fishhook's are purchased nowadays in Soasio. One pack of some 30 fishhooks approximately 3 cm long costs Rp. 300. According to our informants, formerly fishhooks were made of wire. The combination of fishhook size and line thickness is determined by the kind of fish sought.

Although the lure (*lau*), used mainly for catching fishes like *bobara* and *ido* (*Katsuwonus pelamis*) as well as *leanga*, usually goes together with longline fishing (*pa lia*), it is sometimes used in handline fishing.³⁾ In *pa lia*, a long, artificially baited line is trailed behind a slowly moving boat about 1–4 km offshore and within the radius of some 300 m. The line is wound every 20 minutes or so; one operation sometimes yields as many as 15–20 fish. Today this longline method tends to be used less frequently, whereas the lure now seems to be used more frequently, in combination with the handline.

2) SPEAR FISHING (*pa tudu*)

Spear fishing (Photo. 6.) is mostly done during the season of *o kore sara*, since



Photo. 6. Spear fishing.

3) According to the villagers there are two methods of fishing with a long line; catching fish by casting a line on the sea while the canoe is moving (*tuda*; to pull with a hand) and staying at one place (*hau*). Besides, *lia* means "to pull". *Hau* is applied to hand line fishing and *lia* to longline fishing in this paper.

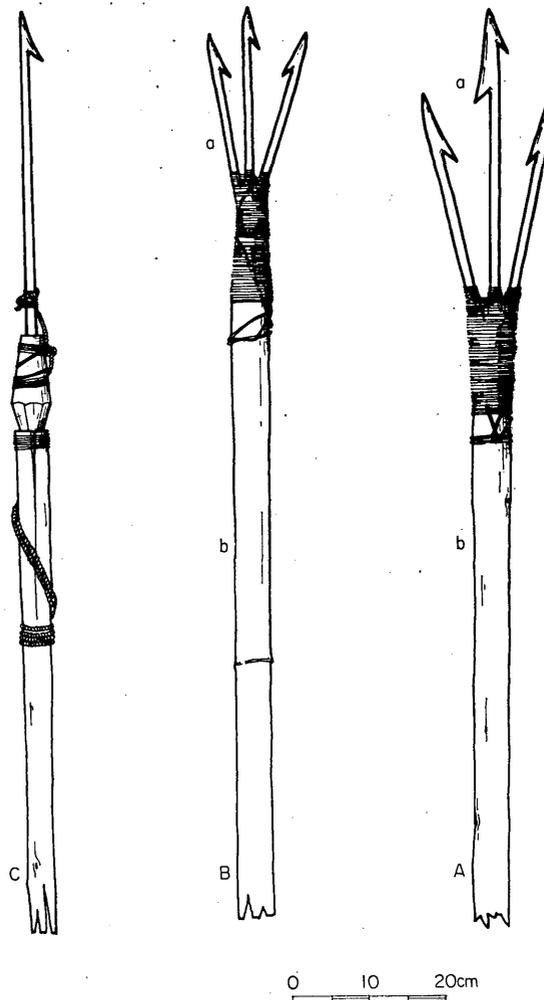


Fig. 3. Spear (*dodofa*, *titiala*).

schools of fish come close inshore at this time. Accordingly, the fishing ground shifts to the relatively shallow ocean floor, about 10–30 m deep, close to the coast. The spear most frequently used is called *dodofa* (A and B in Fig. 3), which comprise a spear head (*ma doto*, lit. iron, [a] in Fig. 3) and a bamboo shaft (*tui*, shown as [b]). The shaft is about 3 m long and the spear head is tied at its top with a nylon thread. The spear head is made in a forge (*dua dua*) with iron bought in Soasio. Those shown here each have three prongs, each with a fluke. When catching a fish, the longest prong in the middle is used for piercing. Some fishing spears are made of wood and bamboo, but originally they were just used by in-migrants from North, Sulawesi (A and B in Fig. 4). Multi-pronged spears like these were probably once used in Limau, but they have been replaced by iron fishing spears.

Other minor articles of spearing gear include the harpoon (*titiala*, [c] in Fig. 3) and a bow-and-arrow (*ngangami*, Fig. 5), each of which is owned by one villager and is

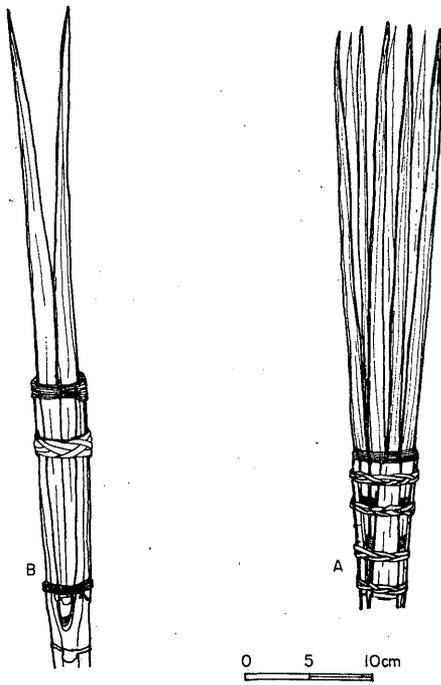


Fig. 4. Wooden spear.

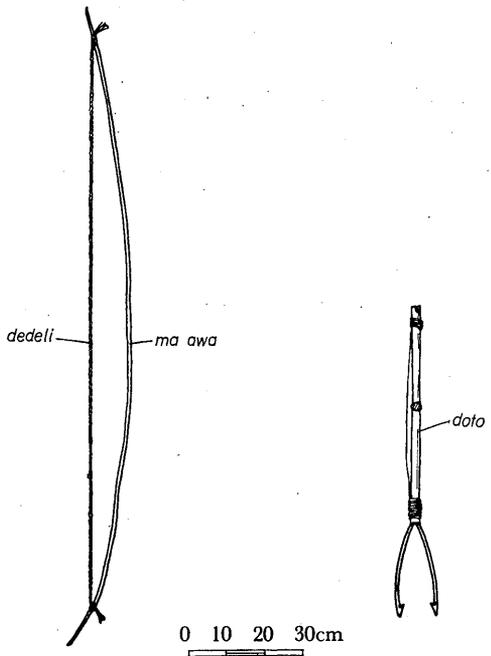


Fig. 5. Bow-and-arrow (*ngangami*).



Photo. 7. Using a *ngangami*.

not normally used. The *titiala* is used in hunting large fish, such as sharks. The fluked head is not tied to the shaft (made of bamboo and about 4 m long); when the harpoon is hurled at a fish, the shaft is taken out immediately, and the harpoon head is tugged at with the attached cord.

The *ngangami*, on the other hand, is a combination of bow (*ma awa*) and arrow (*doto*). Custom taboos the use of bow and arrow for hunting mammals, but the villagers say they can be used to catch fish because fish are aquatic. This activity may be called bow and arrow fishing (Photo. 7). The arrow shown in Fig. 5 has a bifurcated head; other kinds include one-tine and three-tine arrowheads. The *dodofa* is used also to spear a fish that has been hooked and pulled up close to surface with the hand line.

Fishing with these spearing instruments is done during the evening after the

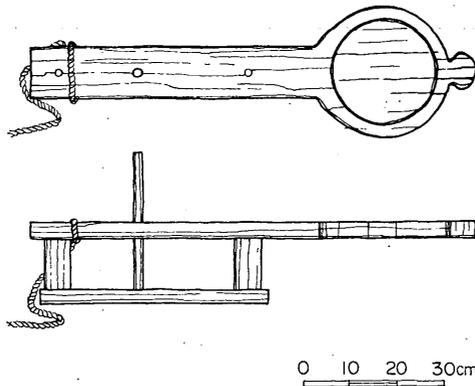


Fig. 6. Lamp holder (*sionga*).

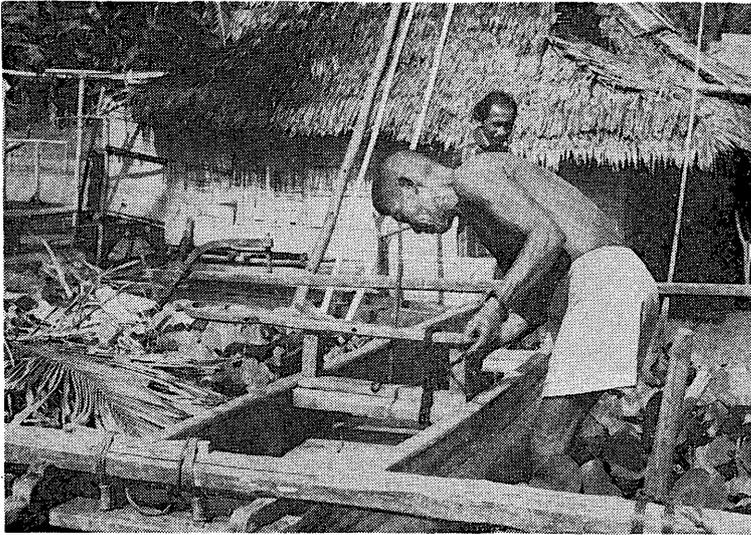


Photo. 8. Setting up a lamp holder.

sunset, at around 7 p.m. from a small canoe (*awa* or *bolotu*), with a pressure lamp tied to the crossbar at the bow (Photo. 8). Some villagers possess a special lamp holder (*sionga*, Fig. 6). Two men, the one who pierces (*ma nomaka*) and the other who paddles (*ma rabaka*), are in the canoe, *ma nomaka* standing near the prow and spearing fish that swim by. Before lamps were known, the villagers burned coconut oil (*gososo igo*) to provide light. Men are usually out spearing fish for about 4 hours, regardless of the number of fish caught. Many species are taken by spear fishing, but I could identify only 10 of the 37 obviously different species caught during own stay in Limau.

3) NET FISHING (*pa soma*)

Fishing nets in use today include scoop nets (*siu*), floating gill nets (*soma bodo*), dip nets (*gogeleba*, *salapa*, etc.). The *salapa* is used to remove fish from the *siu*. *Siu* and *soma bodo* are used in the ocean.

Scoop net fishing (*pa siu*): This is the only large-scale fishing practiced by the villagers and is essentially a form that depends on cornering fish with a scoop net. Eight villagers own a scoop net, but only 3 actually use it in fishing, since they also own the special boat (*pakata*) required for scoop-netting. Of the 8 villagers who possess the net, 4 purchased one, 2 bartered nets and 2 received them as a gift from paternal uncles. The most expensive net cost Rp. 25,000, and the lowest-priced net was Rp. 7,000. The average net cost about Rp. 17,000. Considering that the average monthly income of the villager is Rp. 2,500–3,000, it is not difficult to see that a scoop net is a fairly expensive piece of property for a Limau villager and that not everyone can afford one.

The scoop net is used during the season of *o kore mie*, mainly to catch *ngawaro*.

Men first drive the swarming *ngawaro* that swim 300 to 500 m off-shore toward the coast, by using 10–12 *pakatas*. Since Limau has only 3 such boats, fishing is done in cooperation with the neighboring Lalonga villagers. Children in two small boats positioned at each end of a line of *pakata* help to chase the fish by disturbing the water, either through beating the surface or rocking the boats. When the fish are driven close to the shore, the *pakatas* form a fan pattern as if to enclose the fleeing fish; at the same time the children begin to drive the fish away from the shore into the fan. The men in the *pakata* are ready at the bow with scoop nets, and plunge them into the water. Fish caught in the net are removed with a small scoop net (*salapa*). As many as 60 fish are caught at a single time by this technique (Photos. 9–12).

A scoop net is a bag-like net held with two pieces of bamboo, each about 7 m long. The net, when fully unfolded, is shaped like pyramid. To open the base widely (a), a crossbar (*tako*) is placed at its apex (b) (Fig. 7). The net itself is 7 m × 6 m. Either No. 30 or No. 40 fishline sold at a Soasio store is used for weaving this net. Scoop net fishing is mostly done in the season of *o kore mie*; occasionally people sail south toward C. Lelei to catch the migrating *ngawaro* (Fig. 8). The most recent such expedition for which information was available took place in 1974, when the Limau villagers, joined by Lalonga people, sent only one *pakata*. The trip lasted nearly 3 months. Each crew member of a *pakata* generally has a specific role. Whether fishing is in-shore or far from home, the crew usually consists of 4 men, 1 at the bow who watches and catches fish with the scoop net (*ma namaka o gonge*), 2 paddlers positioned in the center (*ma rabaka i gonge*), and helmsman (*wasi dodu ulu*). But on the 1974 fishing trip a child was taken along to help the crew with bailing and cooking. When fishing far out to sea a small, makeshift sleeping hut (*totangu*) is set up in the middle of the *pakata* (Photo. 13, Fig. 9). A sail (*ma side*) is used for travelling. It takes 4–5 days sailing to reach C. Lelei. When the *pakata* nears the Cape, the sail is furled in preparation for fishing, since the 2 pieces bamboo used in setting the sail are also required for making a scoop net. During the fishing period a makeshift field hut is built near the Shore. Fishing near C. Lelei is done twice a day, once in the morning (about 6–8 a.m.) and once in the afternoon (about 3–6 p.m.). *Ngawaro* are dried for about 24 hours, and then in groups of 20 they are placed between two bamboo lattices (*galifea*, Photo. 14, p. 220). This unit of 20 fish is called *o nawo galifea moi* (lit. "one pack of fish"). A unit of 50 such "lattice-packs" is referred to as *beke moi*. At the Soasio market, one pack of fish sells for about Rp. 200. Since one fishing expedition yields about one thousand fish, the villagers have the cash income of about Rp. 20,000. After a large catch buyers are said to come from as far away as Sulawesi. But relatively small catches are all sold in the villages that dot the C. Lelei area.

Fishing with a floating gill net (*pa soma bodo*): This is usually done by a single individual working alone. The net is 20–30 *depa* (30–40 m) wide and 3 *depa* (about 4 m) high (Photo. 15); lead weights are attached to the bottom and floats (*ma babao*) to the top of the net. The net examined was made in Japan. Fishing with the floating gill net is done in an inshore area where the water is about 20 m deep. One

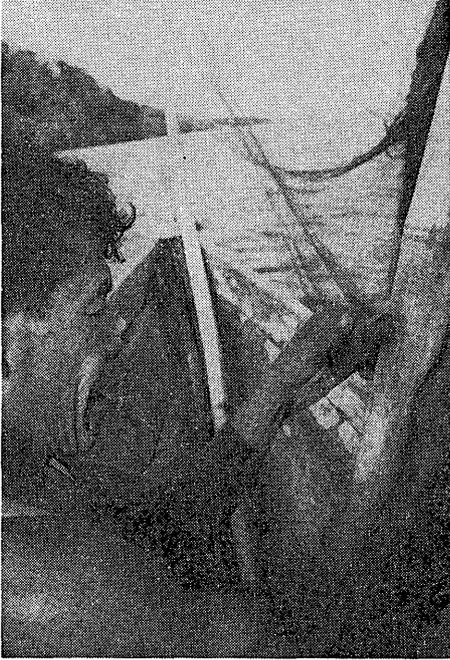


Photo. 9. Checking and assembling the scoop net before arriving at the fishing ground.

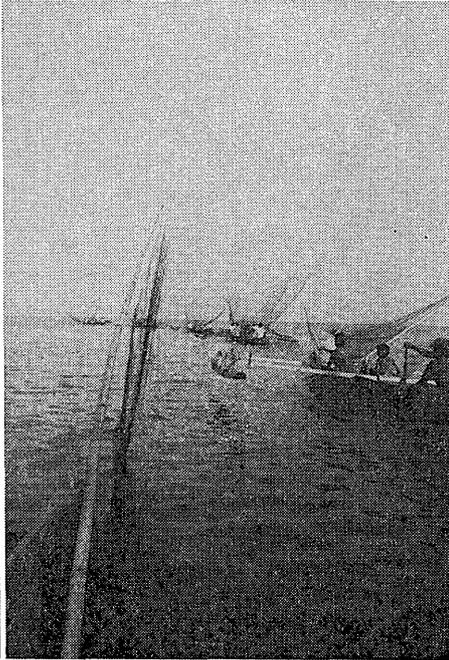


Photo. 10. Departing for the fishing ground.

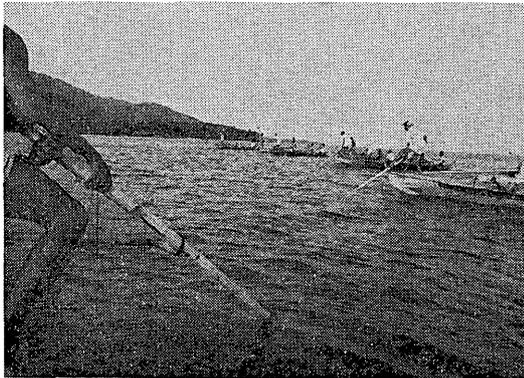


Photo. 11. On reaching the fishing ground the boats fan out. Scoop nets are put into the sea to await fish driven by the beaters.

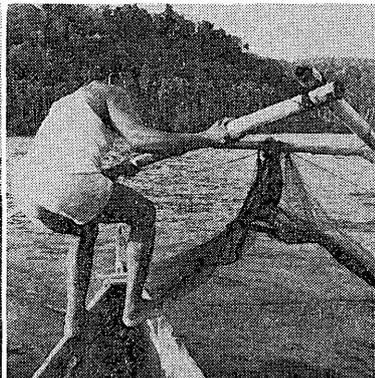


Photo. 12. A great deal of skill is required to pull up the scoop net quickly without letting the fish escape.

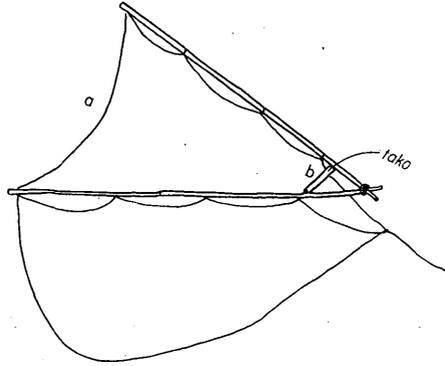


Fig. 7. Scoop net.

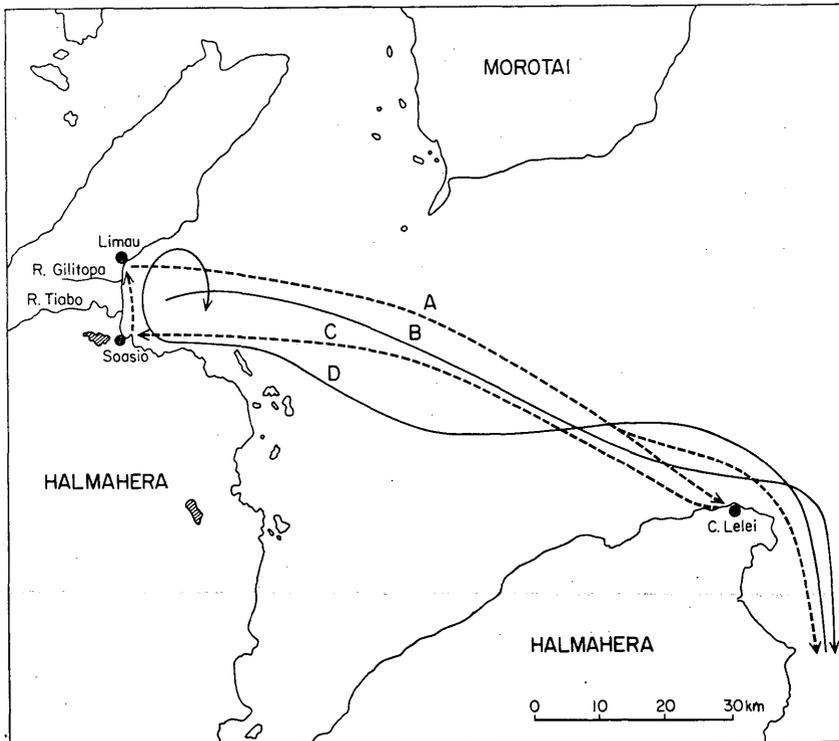


Fig. 8. Scoop net fishing areas.

A: Courses to the fishing ground (June-October).

B: Migratory course of *ngawaro* (June-October).

C: Courses from the fishing ground.

D: Migratory course of *ngawaro* (December-April).

source: Director of Military Survey, Ministry of Defence,
United Kingdom 1972.



Photo. 13. A makeshift hut (*totangu*) is set up.

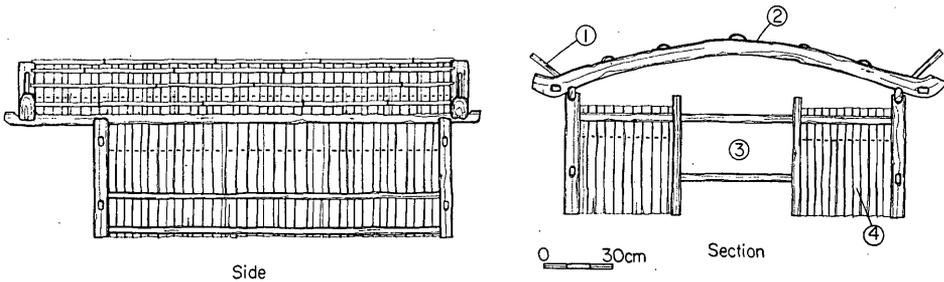


Fig. 9. Makeshift hut (*totangu*).

- ① Stick to fix the cordage (*side ma ngihi*).
- ② Roof (*ma doku*).
- ③ Entrance (*ma noma*).
- ④ Outer wall (*ma gora*) made of sago palm leafflets; *katu* is the material used mainly for roofing (*atap* in Malay).

end of the net is tied to a tree branch and an anchor is fixed to the other end. The net is then pulled and set with the aid of a canoe. All this is done at night. Another way of setting the net is to let it move freely in the water with anchors and floating logs (now replaced by styrofoam floats) attached to both ends. The fishes mainly caught by this technique are *cion* and *bobara*, both of which are migratory and come close inshore during *o kore sara*. The floating gill net is seldom used during *o kore mie*, when fish are not found near the coast.



Photo. 14. Bamboo lattices (*galifea*) used for packing a unit of twenty fish in.



Photo. 15. Floating gill net; floats are made of cork, and the canoe is *pelang*-style.

4) OTHER FISHING TECHNIQUES (*igi, sero*)

So far only the principal fishing techniques of the Limau villagers have been discussed. Less important are the techniques of trap- and hedge-fishing. Both techniques appear to have been introduced by in-migrants, and few people use them.

Trap fishing (*igi*): This technique is employed when catching eels (*goodo*, *Anguilla* sp.), which the Galelans seldom eat, or Taiwanese loaches (*lebo*, *Ophicephalus* sp.), mainly in rivers and swamps. The fishing gear consists of a trap (*igi*) of woven bamboo strips (Fig. 10, Photo. 16). That shown in Fig. 9 depicts a fish trap made by an old man who had move to Limau from Kau (Central Halmahera). This bamboo trap is 100 cm in length and the inside folds at the mouth are about 40 cm long. The people of Maba, near Kau, also use a fish trap, but there it is used in the ocean. According to our informant, Maba people set the fish trap by placing several small rocks inside and a log on top. During the period of our investigation, I accompanied a villager in eel fishing, but the fish trap was not used then (Photo. 17). The only equipment that this man took along was a large hatchet (*pela*) and a thick fishhook. He first waded into what appeared to be appropriate water pool and cut the grass

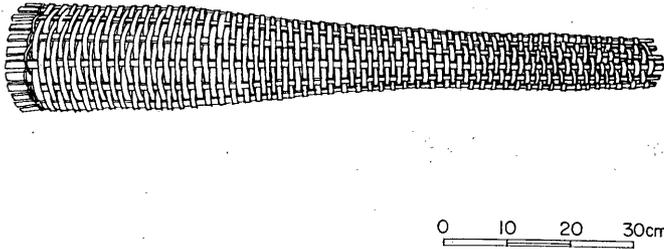


Fig. 10. Cylindrical fish trap.

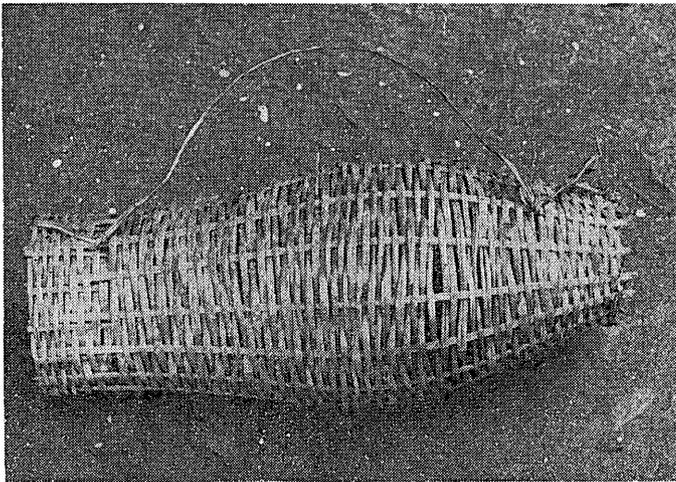


Photo. 16. Cylindrical fish trap; the only one in Limau.



Photo. 17. Catching an eel.

with the hatchet. He then groped in the muddy soil for eels. According to him, one seldom finds an eel at first and groping is patiently repeated in different places until an eel is located. When an eel is found a branch is cut from a nearby tree and used to dig up the place where the eel is supposed to be. After precisely identifying the position of the eel, the fisherman quickly stabs it with the fishhook and draws the eel up. The fishhook is tied to a string to ensure the capture of the fleeing eel. This technique can be called hand catching. Another method is to cut-off the head with the hatchet when an eel is located. It is probable that hand catching was the technique traditionally practiced in the village, prior to the introduction of the trap net.

Hedge-fishing (*sero*): This is usually practiced in the lowland forest near the R. Gilitopa, about 3 km north of Limau. The fish hedge is set up at the low tide. Two cylindrical bamboo hedges are set with a guiding wall of sago palm leaves around them. Each hedge has an entrance for the fish, their exit being prevented by with inside folds. It takes about 3 hours to set the fish hedge, a daytime job done during the ebb tide. Then the hedge is inspected at night around high tide. The main target fish are climbing perches (*Anabas* sp.), together with others of less importance (Photo. 18–20).

Dive fishing, another minor technique, is done in water about 5 *depa* (7–8 m) deep, using a spearing instrument (*titiala*). One villager owned a speargun (*susinapan*), made of wood, and using an iron pole for a spear (Fig. 11). These days people seldom dive for fish.⁴⁾

Shrimps and shiners are sometimes caught in rivers and pools with a scoop net (*gogeleba*), but only one villager had this type of net (Fig. 12, Photo. 21).

4) Besides this the villagers are said to take eggs and meat of sea turtles (*tutuluga*), but they themselves know little about the spawning period.



Photo. 18. Hedge fishing; setting bamboo cylinders and making folds.



Photo. 19. Hedge fishing; making the guiding wall to lure the fish in.



Photo. 20. Hedge fishing; checking the *sero* at midnight.

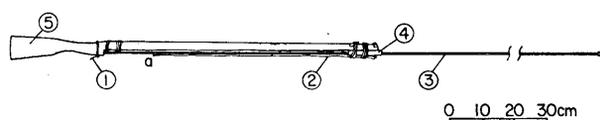


Fig. 11. Spear gun (*susinapan*).

- ① Trigger (*ma kalabenga*).
- ② Rubber tape (*ma golo*). The rubber tape is hooked to the spear(a). When the trigger is pulled, the rubber tape comes off and the spear flies out.
- ③ Iron spear (*ma doto*), about 2 m long.
- ④ Bamboo barrel (*ma lou*), to direct the spear.
- ⑤ Body of the gun is made of wood.

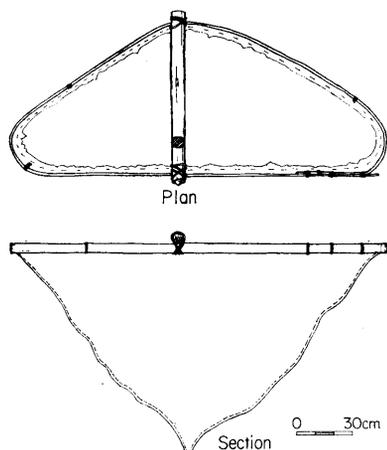


Fig. 12. Scoop net (*gogeleba*).

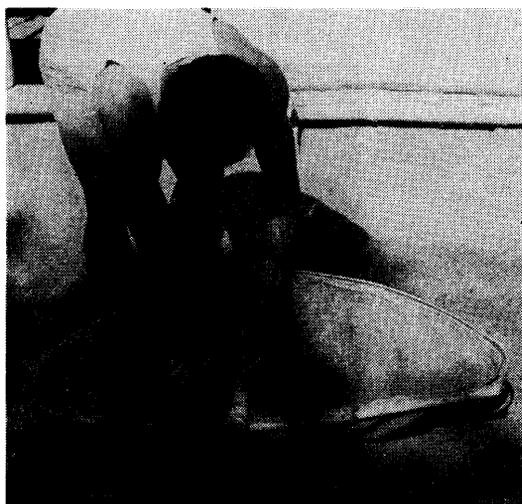


Photo. 21. Demonstrating the use of a *gogeleba*.

3. Fishing Gear: Varieties and Use

The items of fishing gear owned by each village household are shown in Table 2. The number in parentheses denotes the person who belongs to the same-numbered household.

Six households had no fishing gear whatsoever. Five of these (HN13, 14, 16, 21, 22) subsist on hunting, crude sago extraction, bananas, yams, and other wild plants. Hunting, however, like fishing in general, is only a minor means of subsistence. The most numerous items of fishing gear are those related to line-fishing (fishhooks, nylon fishing lines and fishing rods), which are owned by 29 households. Twenty-nine households have fishhooks, 28 have nylon fishing lines, and 9 have fishing rods. Together these account for 85% of the 34 households owning an item of

Table 2. Household ownership of canoes and fishing gear

HN	F.G canoes				5	6	line gear			spears				nets			18	19	20	21	22
	1	2	3	4			7	8	9	10	11	12	13	14	15	16					
1	○				○	○	○	○	○	○											
2					○		○	○		○	○			○							
3							○	○													
4	○				○		○	○		○					○						
5							○	○		○											
6		○			○		○	○		○											
7	○				○		○	○											○	○	
8	○				○	○	○	○		○				○	○				○	○	
9	○				○		○	○		○				○							
10							○	○						○							
11		○			○		○	○						○							
12	○				○		○	○		○					○						
13																					
14																					
15															○						
16																					
17		○			○					○										○	
18	○				○		○	○		○									○		
19	○	○				○	○	○						○						○	
20	○			○	○	○	○	○		○				○	○			○		○	
21																			○	○	
22																					
23	○				○	○	○	○		○				○							
24	○	○			○	○													○		
25	○				○		○	○	○												
26	○		○		○																
27	○				○	○				○	○	○	○	○							
28	○				○		○	○	○	○									○		
29	○				○		○	○	○												
30										○											
31	○	○			○		○	○						○							
32							○	○		○											
33							○	○		○											
34	○				○		○	○	○	○											
35	○	○			○		○	○	○	○				○							
36	○				○		○	○		○	○				○						
37	○				○		○	○													
38	○				○		○	○		○											
39	○		○		○	○				○				○				○		○	
40							○	○													
(40)	○				○																
41			○		○																
(41)			○		○																

Notes: F.G=fishing gear

HN=house number

- | | | |
|---|---------------------------------------|-------------------------------------|
| 1. small canoe (<i>awa</i>) | 9. rod (<i>totobe</i>) | 17. gill net (<i>soma bodo</i>) |
| 2. small canoe (<i>bolotu</i>) | 10. spear (<i>dodofa</i>) | 18. trap (<i>igi</i>) |
| 3. middle-sized canoe (<i>pakata</i>) | 11. bow-and-arrow (<i>ngangami</i>) | 19. fishing box (<i>sauba</i>) |
| 4. small canoe (<i>pelang</i>) | 12. spear (<i>jau</i>) | 20. water glass (<i>cermin</i>) |
| 5. paddle (<i>sari</i>) | 13. harpoon (<i>titiala</i>) | 21. reel (<i>babalin</i>) |
| 6. sail (<i>side</i>) | 14. scoop net (<i>siu</i>) | 22. outboard motor (<i>motor</i>) |
| 7. fish hook (<i>gumara</i>) | 15. dip net (<i>gogeleba</i>) | |
| 8. fishing line (<i>nilon</i>) | 16. dip net (<i>salapa</i>) | |

fishing gear. Twenty-one households have some kind of spearing instrument; 21 have a three-prong spear, 3 have a bow-and-arrow, 1 has a one-prong spear, and 4 have a harpoon. Eight out of 15 households own a scoop net, but only 3 households possess the type of canoe essential for the scoop net fishing. Five households not owning a canoe do not practice scoop net fishing. Similarly, the day-to-day fishing in those households with a floating gill net is done mainly by line fishing the net itself being seldom used.

Line fishing is the principal village fishing activity, from the viewpoint of items of fishing gear in use. As is clear from Table 2, the essential items are fishhook and line which are matched according to size and the thickness. Table 3 compares the ideal combination (denoted by +) as given by our informants and the actual combination used in fishing (denoted by -). (O) denotes where the "ideal" and "actual" coincide. High numbers designate the thicker lines (row N), but for fishhooks the higher the number the smaller the size (column G). The smallest fishhook, No. 20, is 1 cm long, and the largest, No. 1, has a length of 9.5 cm. There are 3 groups of ideal combinations: the first between fishhooks No. 20-14 and nylon fishing lines No. 10-25, the second between No. 13-9 and No. 25-60, and the third between

Table 3. Combination of fishhooks and line

N \ G	No. 10	15	20	25	30	40	50	60	70	80	90	100
No. 20	-	+	-		-							
19			+									
18	○	+	○	+	-							
17	○	+	+	+	-							
16	○	+	○	+	-		-	-				-
15	○	○	○	○	-	-						-
14	○	+	○	+	-		-	-				-
13	○		-		-		-	-				-
12	+		○	-	○							-
11	○	-	-	-	○		-	-				-
10	○	-	-	○	○	+	-	-				-
9		+	+			+	+					-
8			-		-	+	○	○				-
7	-		-		-		-	+	+	+	+	-
6				-			+	○	+			+
5								+				+
4			+			+		+			+	+
3								+				+
2								+				+
1								+				+

Notes: N=*nylon* (fishing line) G=*gumara* (fishhook)

plus sign (+) shows the ideal combination

minus sign (-) shows the actual combination

circle shows where "ideal" and "actual" combinations coincide

No. 8-1 and No. 70-100. They each show that the size of a fishhook and the thickness of a fishing line are proportionately related in an ideal combination. Needless to say, selection from the combinations is greatly influenced by the kind of fish sought. For instance, the villagers claim that the combination of fishhooks No. 15-18 and the fishing lines No. 15-25 is ideal for catching *leanga*, which in fact, corresponds to actual practice. But on the whole, the villagers do not necessarily stick to the ideal combination, probably because the combination itself is of little relevance. Although not much caring about the thickness of a fishing line, the villagers carefully select the size of a fishhook, since as they put it, "a fishhook must be chosen to fit the mouth of a fish." This is confirmed by Table 2. Thus, for instance, nobody actually uses a fishhook larger than No. 5; as larger hooks are too big for the fish species, all about 20-30 cm in size, caught near the village. Fishhooks larger than No. 5 are mainly used for catching large fish such as sharks. Table 4 lists the villagers' fishhooks and nylon fishing lines based on the previous classification. Sixty-five hooks are smaller than No. 5, 45 of which are of sizes No. 10-18. On the other hand, 30 or 60% of the nylon fishing lines are of No. 10-30. Thus the most likely combination would be between fishhooks of No. 10-18 and fishing lines of No. 10-30, which to a significant degree is covered by the ideal combination for *leanga* fishing.

Prior to the introduction of nylon fishing lines, in 1974, the Limau villagers used lines made from the bark fibers of the *ma ngumi* tree. Before the use of *ma ngumi* fibers,

Table 4. Number of villager's fishhooks and nylon fishing line

size	hook	line	size
No. 1	0	0	No. 10
2	2		
3	1	5	15
4	1	3	20
5	1		
6	2	15	25
7	5		
8	3	7	30
9	6		
10	5	11	40
11	4	1	50
12	5		
13	5	4	60
14	7		
15	9	2	70
16	5		
17	2	0	80
18	3	1	90
19	0		
20	4	0	100
total	70	51	—

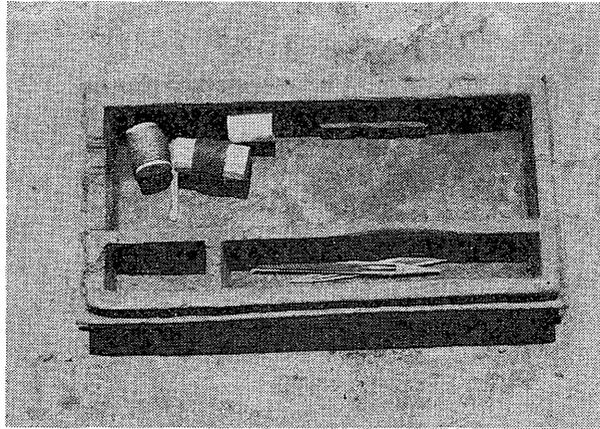


Photo. 22. Tackle box, a portable toolbox used by a fisherman when he goes at sea. The box is made of *gowasa* (*Vitex punctata*) and its dimensions are $14 \times 30 \times 22$ cm.

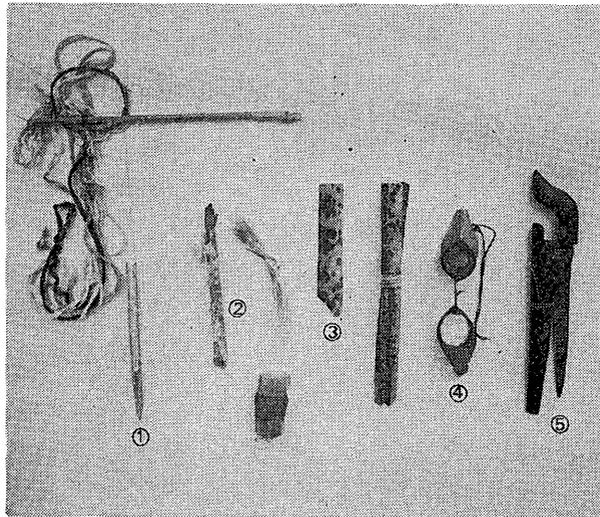


Photo. 23. Fishing tackle.

1. Bamboo needles used to repair nets.
2. Feather for lure.
3. Bamboo for net-repairing needles.
4. Water glass; the glass is shaved with a knife and fixed to the wooden frame with putty and resin. Glasses are used to see underwater when nets become tangled or caught.
5. Knife and sheath (blade length is 14.5 cm).

it is said that they used to make a fishing line from the bark fibers of the bamboo-like *bi awa* tree (*Maranta dichotama*). But the *bi awa* fishing line could not be used more than twice, and since the nylon lines can be used repeatedly, lines of *bi awa* are no longer used.

4. The Catch, its Distribution and Consumption

Table 5 tabulates the quantities of all kinds of fish caught during one week each in October and November. It is based on an investigation using 6 informants to establish the quantities of each fish caught, local names, and the fishing techniques used during these two weeks. There was a one month lapse between the two weeks so that the variation in the types of fish caught in *o kore sara* and *o kore mie* could be observed.

The distinction between the dry and the rainy seasons in Halmahera is not climatically definite. But a clear distinction can be observed in the types of fish taken in each season. Particularly salient is the contrast of *leanga* in *o kore sara* and *ngawaro* in *o kore mie*.

The catch of *leanga* in October is 344, and that in November, 418 (Table 5), the increase in November probably occurred because it is the transitional period from *o kore sara* to *o kore mie*. *Leanga* do not completely disappear from the coastal waters until December, and the November waters are still rich in them. On the other hand, the *ngawaro* catch in October is 0, whereas in November it is 145. Only 3 villagers ever catch *ngawaro*, and the table is a record of 2 of their catches.

Eighteen species of fish caught during the above two weeks of investigation have been identified. Of these *leanga*, *cion* and *bobara*, all of Carangidae family, are caught in *o kore sara*. The rest can be caught all-year-round, except *ngawaro*, which is caught only in *o kore mie*. The difference of 230 in the fish catch between October and November is partly the result of the appearance of *ngawaro* in November, and stems partly from the still lingering *leanga*. *Leanga* accounts for 74 % of the entire catch, confirming the villagers' belief that "you can catch only *leanga* in *o kore sara*."

A villager, Ha, caught more fish than anybody else, catching a total of 185 fish during October and November, because he catches more *leanga* than anyone else in order to sell them smoked at a Soasio market. The smoked *leanga* are about 20 cm long, and 6-7 sell for Rp. 100. He sells about 200 smoked *leanga*. Most villagers, however, use their catch for family subsistence, thus he is an exception.

Table 5 shows that line fishing, spear-fishing and net-fishing were practiced 20, 11 and 2 times respectively during the period of investigation. The former was done exclusively by hand line and the net-fishing with the scoop-net, and gear for it outnumbered the other techniques. Table 6 tabulates the number of fishing operations and the quantities of fish caught per day over during the two-week investigation period. Since fishing is done twice a day, the table is divided into morning (AM) and afternoon (PM), AM representing the hours from 6-10 a.m. and PM from 5-8 p.m. The hours were fixed by the times of the earliest and the latest fishing operations in each time frame.

The number of fishing operations of the 6 villagers during the period of 14 days totalled 86, of which line fishing accounted for 73, spear fishing 11, and net fishing 2.

Table 5. Quantities of fish caught by species, fisherman, and the fishing technique employed

fishing technique	total	1						fish species	2						total	fishing technique
		Ab	Ym	Je	Ha	Sm	Ay		Ab	Ym	Je	Ha	Sm	Ay		
○	344	76	43	70	65	50	40	<i>leanga</i>	88	38	56	120	62	54	418	○
—	—	—	—	—	—	—	—	<i>ngawaro</i>	—	—	85	—	—	60	145	△
○ ×	6	—	1	—	—	3	2	<i>ruo</i>	2	—	4	3	2	5	16	○ ×
○	6	—	3	1	—	2	—	<i>kusese</i>	—	—	4	5	—	3	12	○
○	9	3	—	1	3	2	—	<i>lasi</i>	—	3	—	2	3	3	11	○ △
○	12	—	—	3	6	—	3	<i>ngongare</i>	3	—	2	—	1	—	6	○
○	3	—	—	2	—	1	—	<i>cion</i>	1	—	2	—	—	—	3	×
○	10	2	—	3	—	1	4	<i>bobara</i>	—	—	7	—	—	—	7	○
×	1	1	—	—	—	—	—	<i>nyowa</i>	1	—	—	—	—	—	1	×
—	—	—	—	—	—	—	—	<i>lodi</i>	—	—	1	—	1	—	2	○
—	—	—	—	—	—	—	—	<i>ngangadike</i>	2	2	—	—	—	1	5	○
—	—	—	—	—	—	—	—	<i>tolouro</i>	1	1	—	—	—	—	2	○
○ ×	3	1	2	—	—	—	—	<i>gaca</i>	1	—	1	—	1	—	3	×
×	2	1	1	—	—	—	—	<i>sidoene</i>	2	—	—	—	—	—	2	×
—	—	—	—	—	—	—	—	<i>gasango</i>	3	—	—	—	—	—	3	○
×	1	1	—	—	—	—	—	<i>udi</i>	2	—	—	—	—	—	2	○
×	1	1	—	—	—	—	—	<i>sakloro</i>	—	—	—	—	—	—	—	—
○	7	1	—	2	—	2	2	<i>turusi</i>	—	—	—	—	—	—	—	—
total	405	87	50	82	74	61	51	total	101	44	162	130	70	126	638	—

Notes: 1 indicates 16-22 October. 2 indicates 20-26 November.

Ab, Ym, Je, Ha, Sm and Ay indicate informant's name.

○=line fishing ×=spear fishing △=net fishing

Allowing for possible individual differences, we can say that each man went fishing once every 2-3 days. In 72 of the 86 operations fish were actually caught. This is a fairly high percentage although the villagers themselves do not seem to care much about their daily fish catch; a man who is unlucky may simply ask another person for fish, or he may barter something for them.

Since except for scoop-netting each operation is done individually, seldom are the fish caught distributed to other villagers. Only when somebody else's gear has been borrowed or when fishing is done cooperatively (as is the case of scoop-netting) are fish ever distributed.

Eight instances of borrowing items for fishing were recorded, of which boats accounted for 5, fishing spear 1, and fishhooks 2. There were also 7 instances of tools for boat-making being borrowed. In only 2 of these 22 instances did borrowing ever take place between blood relatives (one man borrowed from his paternal cousin, and the other from his brother), the rest being between unrelated neighbors. One man who had borrowed a boat from his neighbor gave him 15 fish (out of the 40 caught), whereas another gave the boat owner 10 fish out of the 25 caught. Usually one-third of a catch of the day of the borrowing is given, providing that fish have been caught. If none are caught, repayment is deferred to a later date, when fish are taken. Strictly speaking this is not distribution but rather a clearance of debt.

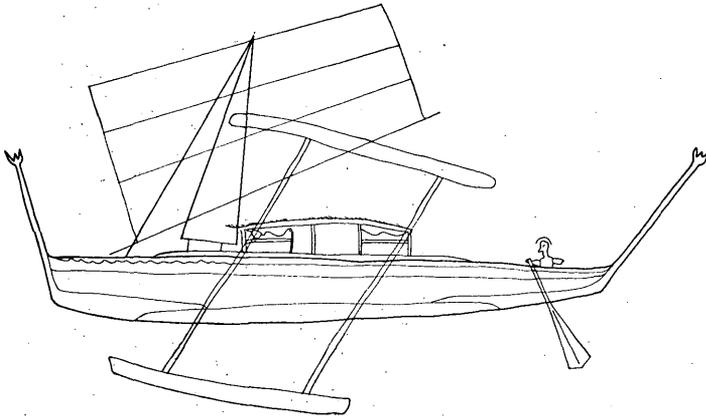
But members of a scoop-netting crew distribute the fish equally among themselves. Using the example of the trip to fish off C. Lelei, the 5 crew members each took 2,000 fish out of 10,000 that were caught during the period, the child being treated as their equal. Should there have been another man, such as the owner of the either boat or the net, the catch would have been divided equally to include him. Thus joint operation pre-supposes equal distribution. When I accompanied villagers for scoop-netting, I was later given half of the entire catch (20 out of 40). Although there were 6 crew members (including me), all, apart from me, members of one family, the fish were divided equally between them and myself. Members of a family are thus regarded as one person in a joint operation.

Fish are generally used only for family subsistence, but those not needed are sold. In the C. Lelei operation, for example, fish were sold to people from Sulawesi or from the village near the fisherman's camp site. They also sold some on their way back to Limau. But on the whole such selling is rare, except after scoop-netting or *leanga*-catching.

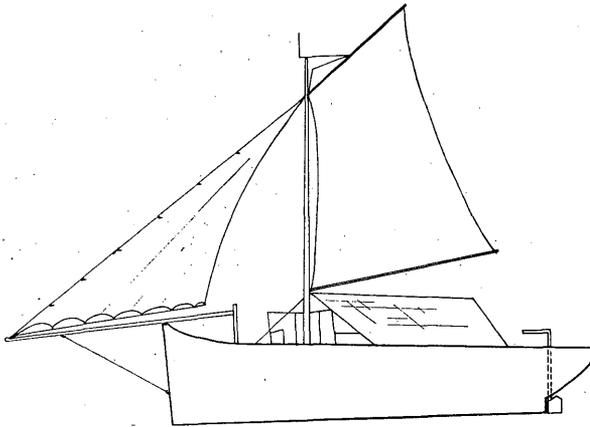
II. CANOES (*deru*)

1. Canoes in Limau: Their Structures and Types

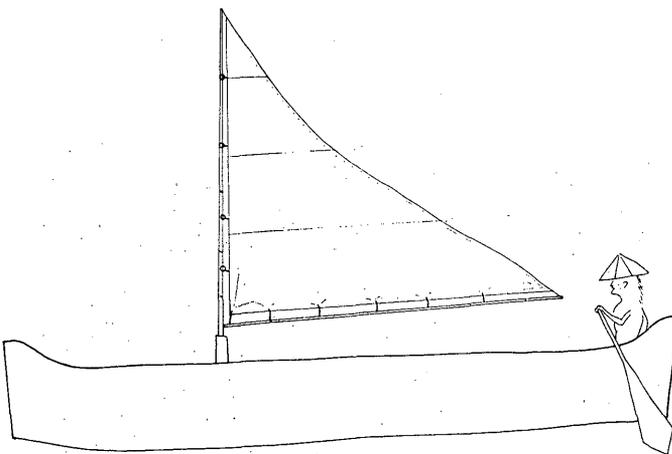
The canoes of Limau Village are double outriggers, fitted with floats on both sides of the boat (Photo. 24-29). The floats are attached to two laterally projecting spars or booms, a typical characteristic of canoes in this part of Indonesia, southern Philippines, New Guinea and a part of the Solomon Islands [DORAN 1974: 133-134]. Haddon and Hornell note that floats are attached to the booms in two different ways;



a. *side galela* (middle-sized canoe: *pakata*).



b. *side fenesu* (middle-sized canoe: *fenesu*).



c. *side bugisu* (middle-sized canoe: *lepa-lepa*).

Fig. 13. Three types of sail.

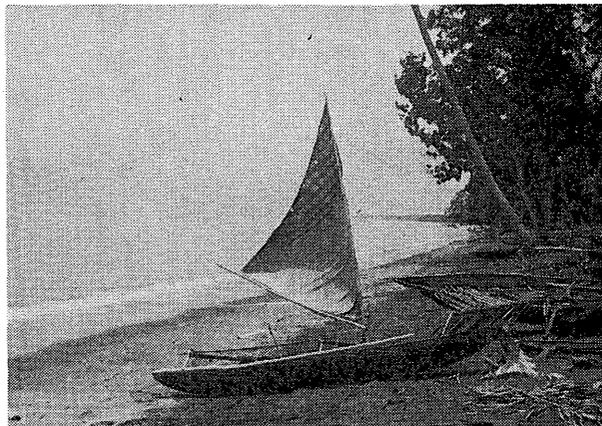


Photo. 24. Small canoe (*awa*).



Photo. 25. Small canoe (*bolotu*).

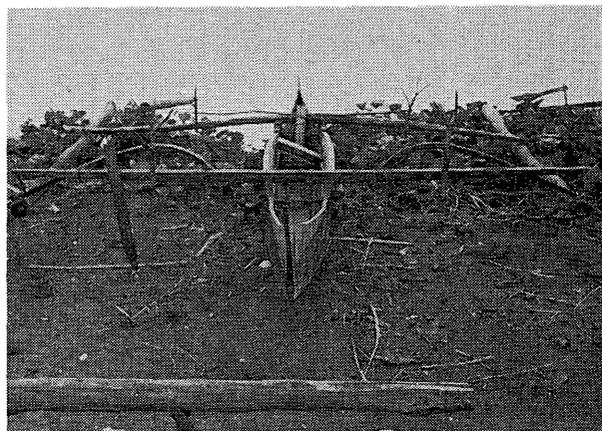


Photo. 26. Small canoe (*pelang*).

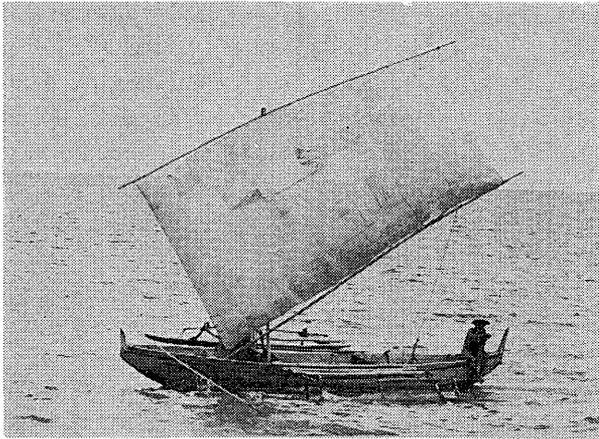


Photo. 27. Middle-sized canoe (*pakata*).

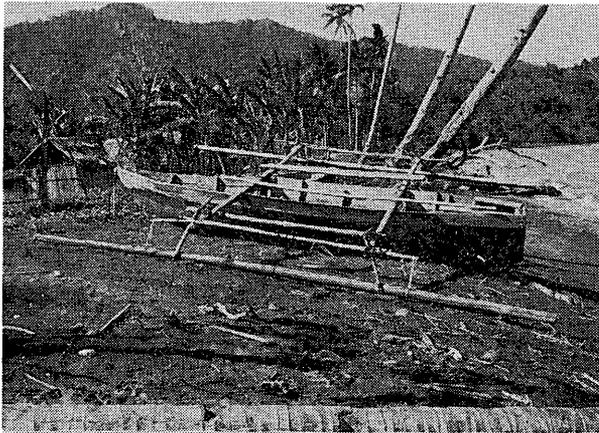


Photo. 28. Middle-sized canoe (*lepa-lepa*).

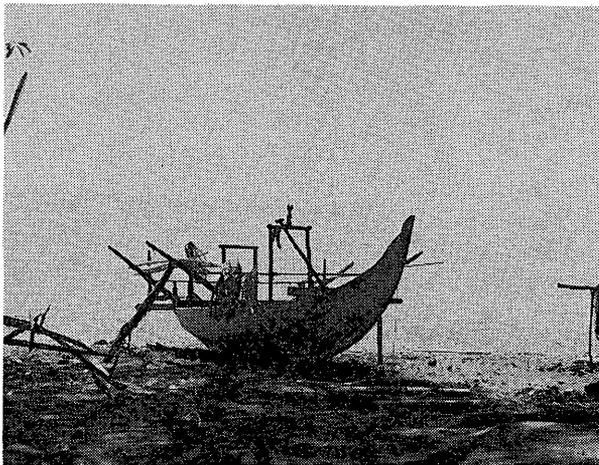


Photo. 29. Middle-sized canoe (*rorehe*).

direct and indirect attachment. Further, the connectives used are either ① lashed or ② inserted; ① using a string and ② a mortise and tenon [HADDON and HORNELL 1938: 25]. Whereas floats and booms are directly connected in the direct attachment, they are connected by means of some auxiliary material in indirect attachment (Fig. 14). The canoes in Limau are of type ① and use the indirect attachment.

The ①-type connectives are further subdivided into a \perp -shaped stanchion, elbow, and withy connectives (Fig. 14). Limau villagers use elbow connectives (also known as Halmahera connectives) using boughs bent in the shape of a bow or at a right angle for connecting booms and floats [HADDON and HORNELL 1938: 9]. Of the Limau canoes, *awa* and *bolotu* use (c) whereas *pakata* uses (a) of Fig. 15.

The villagers use either *awa*, *bolotu* or *pakata* for daily activities. Although each part of these canoes is identified by the same name, the first two are dugout canoes whereas the last is planked. Fig. 16 and Fig. 17 give floor plan, side view and cross section of *pakata* and *bolotu*, respectively.

Pakata is made by planking the frame attached to the backbone formed by a keel (*ma awa*) and auxiliary structural members (*ma pakata*, Fig. 16). The keel and the auxiliary members are made of *bolawaro* and *gowasa* (*Vitex punetata* Schaver), respectively, both which attain a height of more than 20 m. Both bow (*dina*) and stern (*dai*) are decorated with wooden poles having the figure of the cross (*ma karuru*, Photo. 30). The top plank of each side of the canoe has a wave-like carving (*ma loloto*). At the very end of the bow is a small crossbar (*ma logi*) that provides leverage by supporting the bottom ends of the two bamboo poles used for stretching a scoop net. (Photo. 31). Slightly further toward the bow from the middle of the canoe is *ma side ma titi*, used for fixing the sail. To unfurl a sail, 3 bamboo poles each about 5 m long, are set to from a cone, and 2 are inserted into holes in the *side*

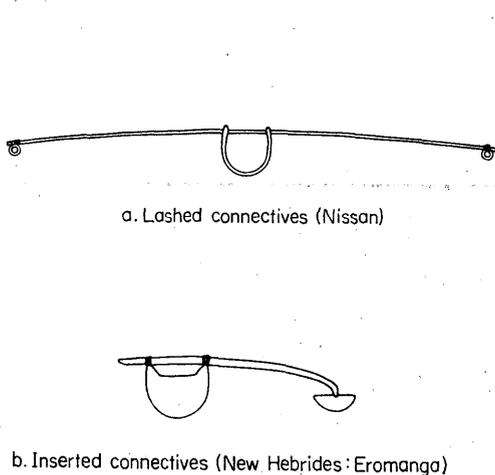


Fig. 14. Direct boom attachment. [HADDON and HORNELL 1938: 24, 26]

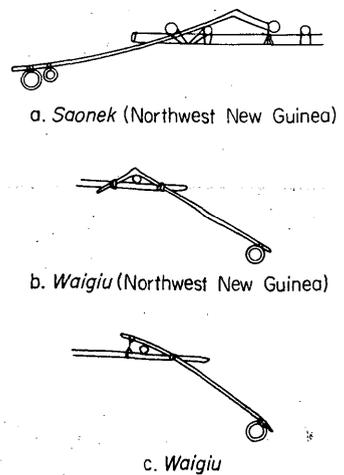
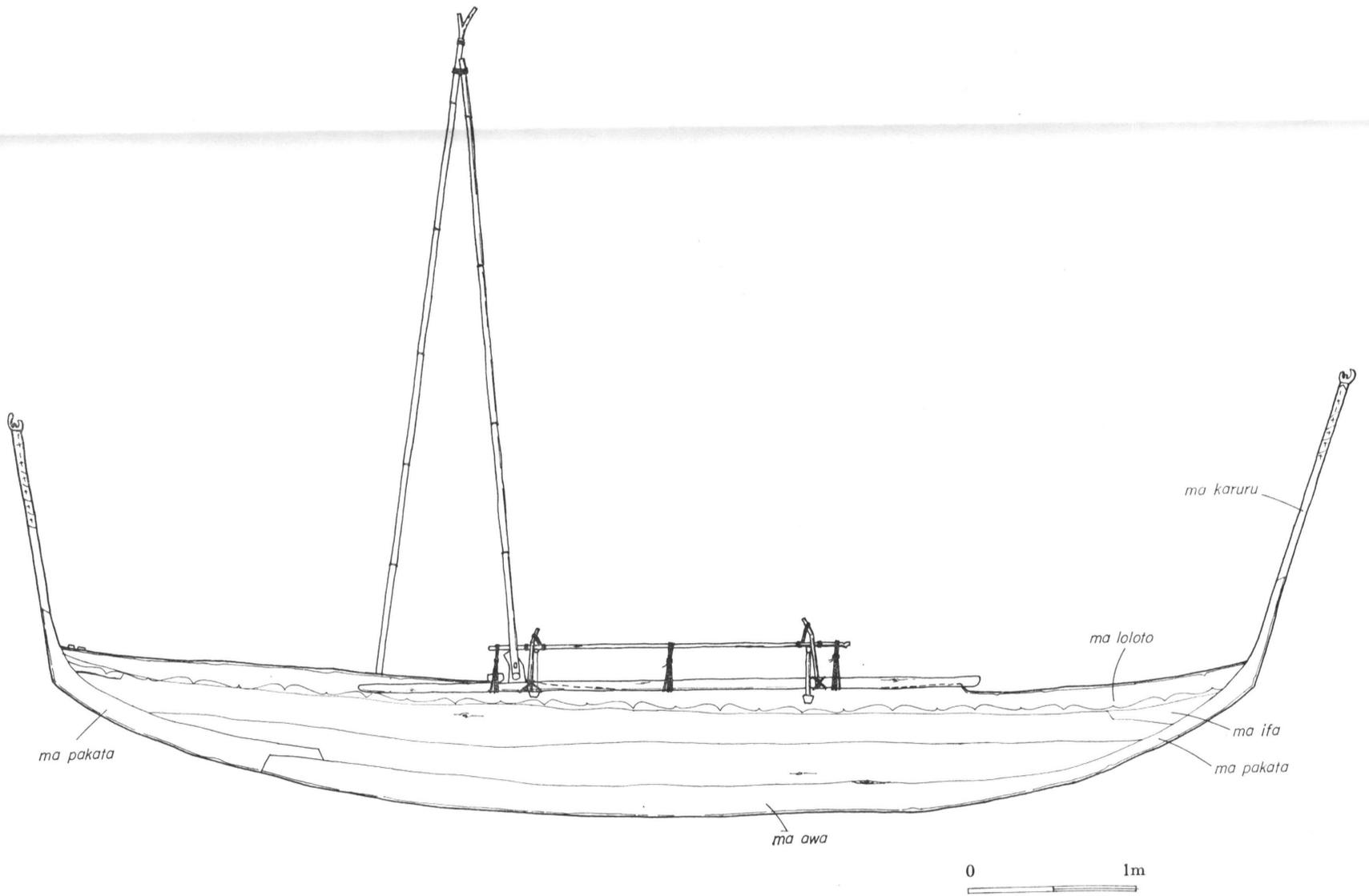
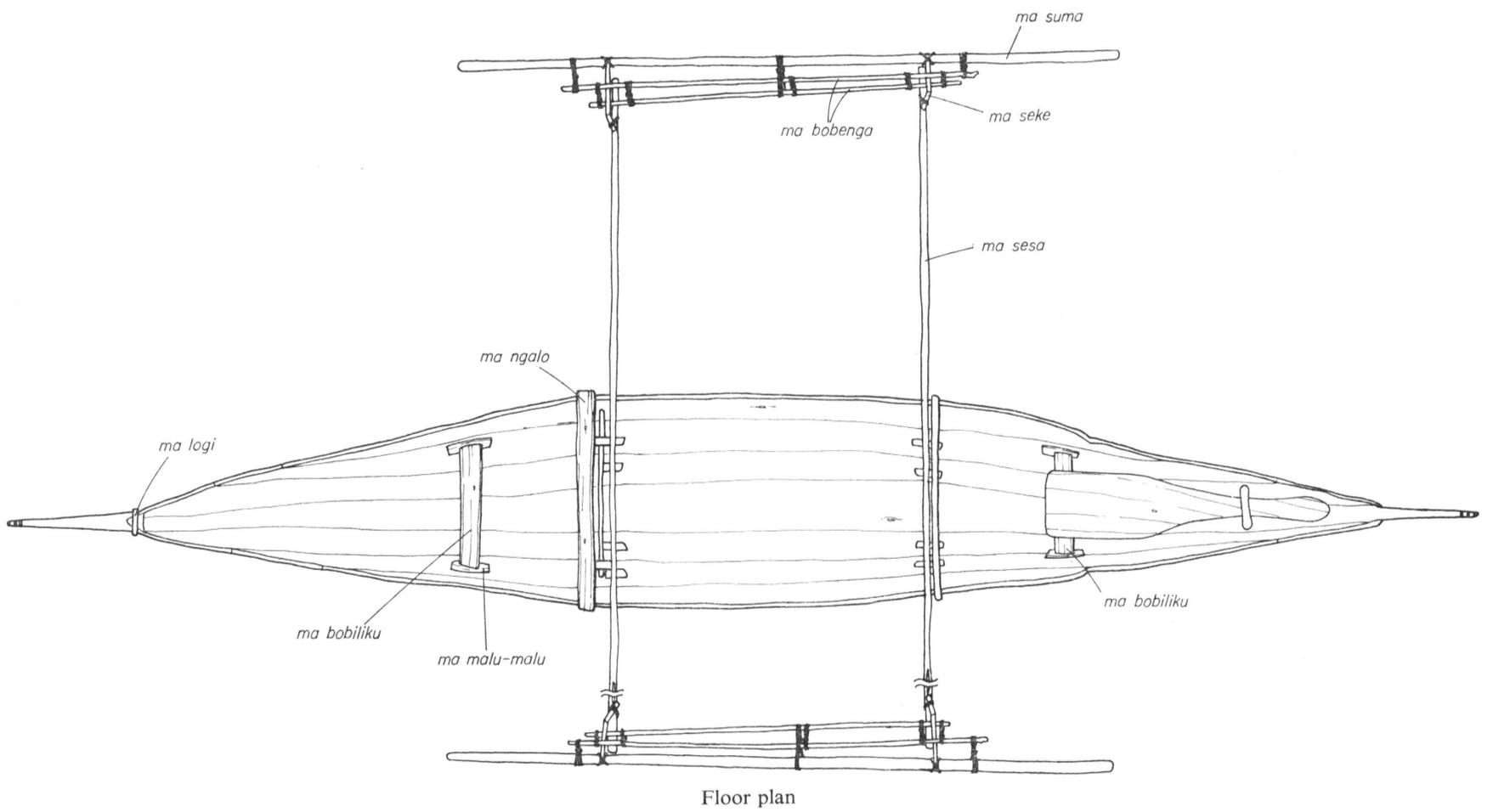
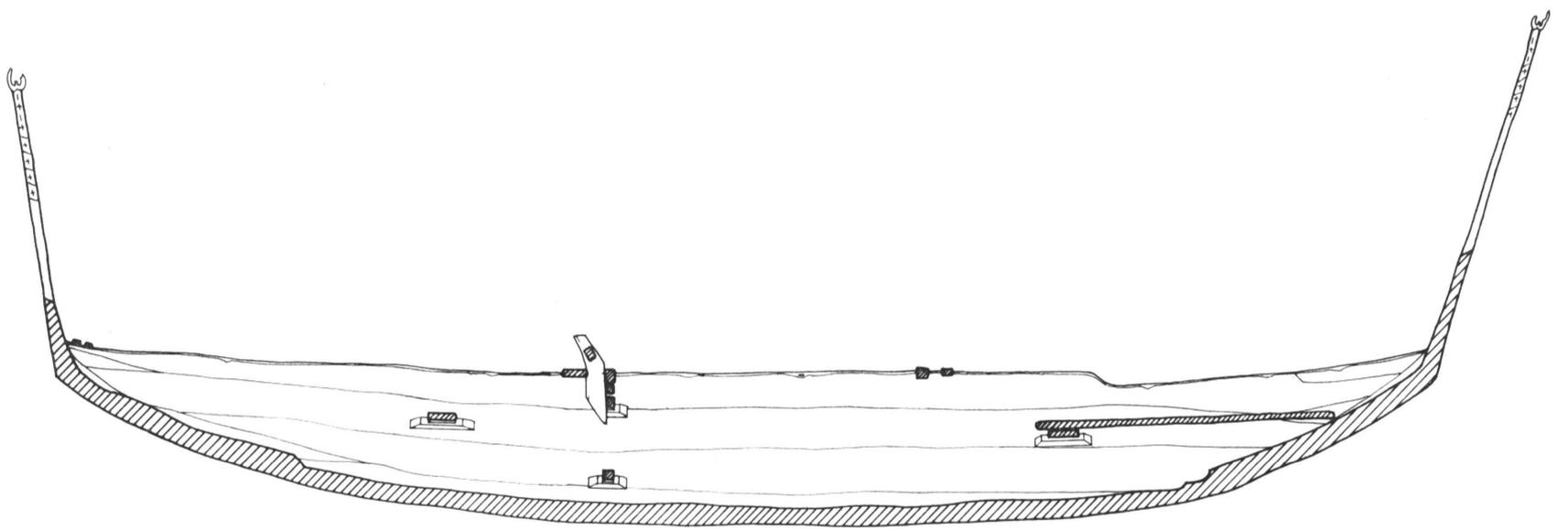


Fig. 15. Indirect attachment (elbow connectives). [HADDON and HORNELL 1938: 35]

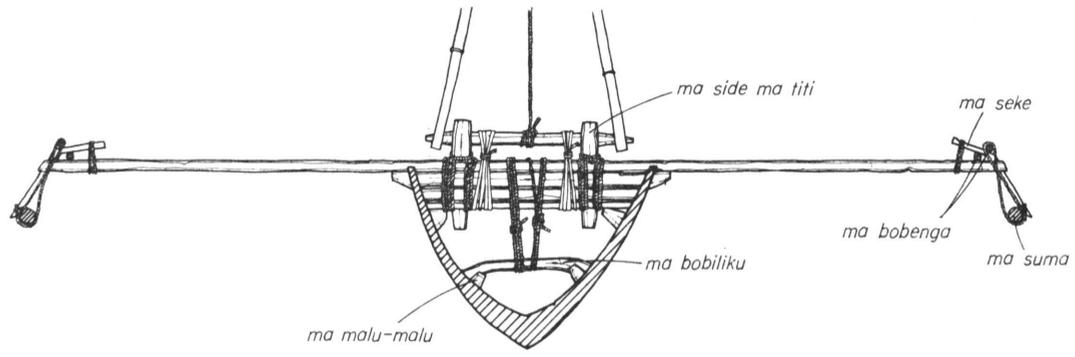


Side view (1)

Fig. 16. Canoe of the *pakata* type.

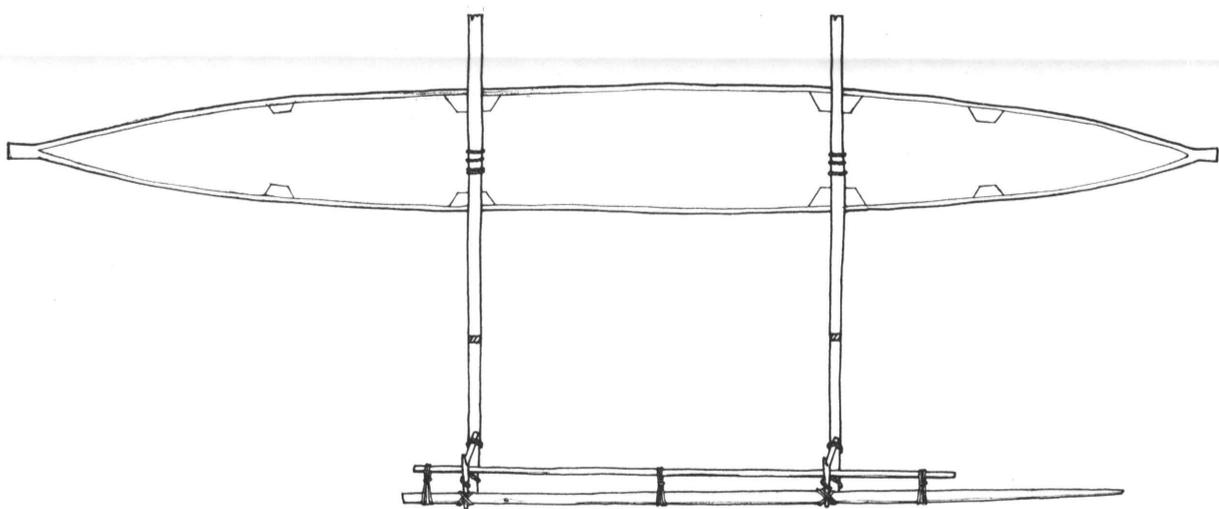


Side view (2)

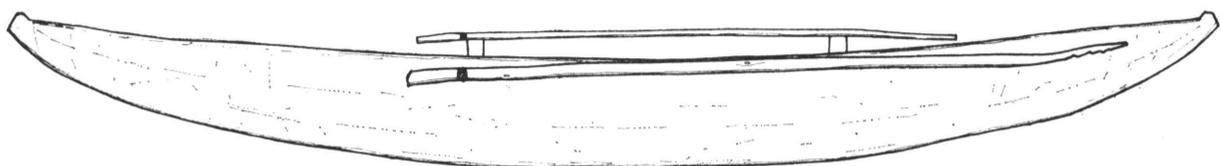


Cross section

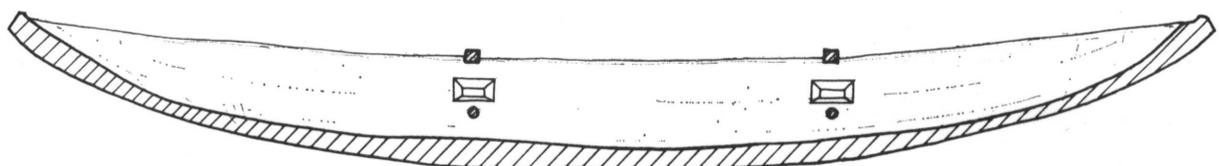
Fig. 16. Canoe of the *pakata* type.



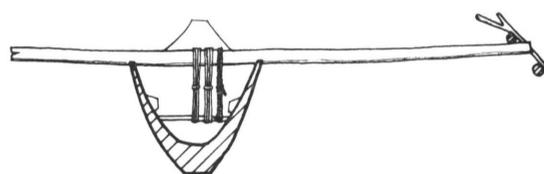
Floor plan



Side view (1)



Side view (2)



Cross section

Fig. 17. Canoe of the *bolotu* type.

ma titi. The other pole is tied to a small wood batten (*ma ngalo*) at the side of a canoe near the bow. The 3 poles are then tied together at the apex, and a Y-shaped stick inserted into one of them. This functions as a pulley raising or lowering the sail (Photo. 32-34).

The cloth sail (*ma side*) measures 2×4 m. Formerly the sail was made by stitching together pandanus leaves with the threads made from sugar cane fibers. People used only paddles in the days before sail but probably the informants were referring to a different type of canoe, such as those used for long journeys. Two of the 3 poles used for unfurling the sail are called male and female bamboo (*ma nau* and *ma beke*, respectively), but the meaning of this is not clear. The sail is tied to the 2 poles with coconut fiber ropes (Fig. 18).

According to the informants, there are three types of sail; *side galela*, *side fenesu*, and *side bugisu* (Fig. 13, p. 233), each being used with a specific kind of canoe. *Side galela* is used for *pakata* (Fig. 13-a). Only three villagers now possess this type of sail. *Side fenesu* (Fig. 13-b) is used for the *pelang* (used in North Sulawesi).



Photo. 30.

Wooden poles bearing the figure of the cross (*ma karuru*).

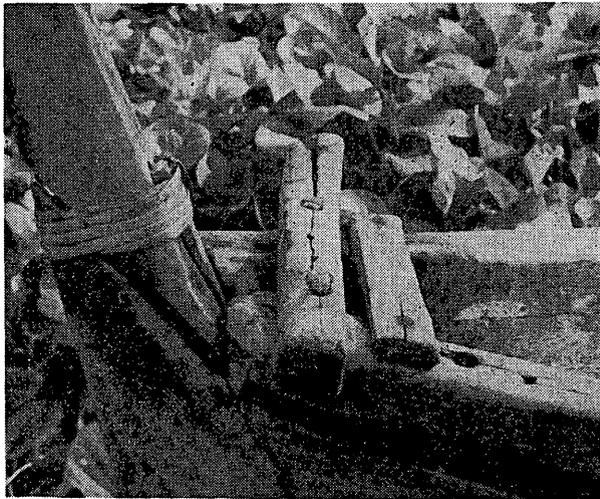


Photo. 31. Small crossbar (*ma logi*) which provides leverage by supporting the bottom ends of the two bamboo poles used for stretching a scoop net.

There is only one *pelang* in Limau Village. *Side bugisu* (Fig. 13-c) is used for the *awa*, the *bolotu* and the *lepa-lepa*. These sails are not used often since relatively few villagers possessed them and the inshore daily fishing activities do not require their use.



Photo. 32. Unfurling the sail of a *pakata*-style canoe; setting three bamboo poles in cone.



Photo. 33. Setting a cordage on the pulley at the top of the pole and pulling-up the sail up.



Photo. 34. The sail is completely unfurled.

Inside the *pakata* are 3 projecting parts (*maru*) to support the crossbar (*ma ngalo*). Special planks (*ma ifa*) are used near to bow and stern to make the canoe more impervious to water.

The outrigger comprises 2 spars (*ma sesa*) and a float (*ma suma*), which is connected by an auxiliary flying spar (*ma seke*) bent almost at a right angle. The connection is reinforced by two *ma bobenga* placed lengthwise to hold the *ma seke* tight (Fig. 19 and 20).

The paddles for rowing *pakata* are about twice as large as those used for other types of canoes (Fig. 21). They are never decorated except for some occasional, simple, grooved notches. The hand is called *mata puana*, the shaft is *ma mumu*, and the blade is *ma lade*. A paddle is always shaped with a hatchet from a hard wood like *gowasa*. It takes 2-3 days to make a paddle.

A *pakata* measures 7.5 m from bow to stern and has a width of 1.2 m. The outrigger is about 5 m long. According to the villagers, a family may use the *pakata* to migrate, sailing for days to do so. Since nobody in the village can build a *pakata*,

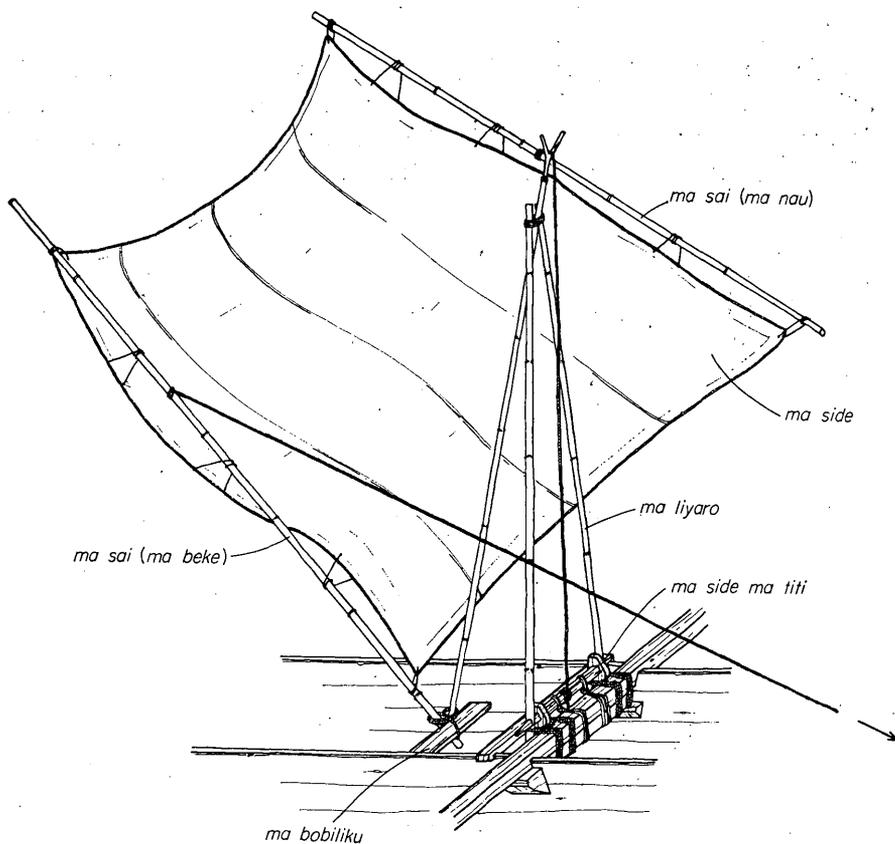


Fig. 18. Connecting part of sail of the *pakata* type.

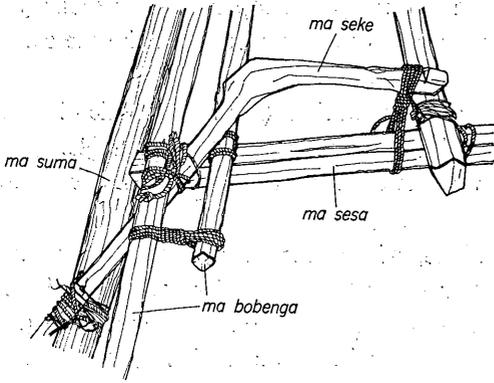
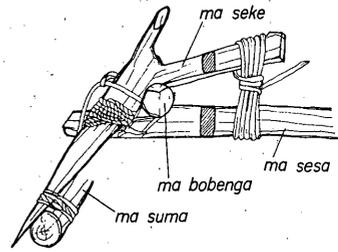


Fig. 19. Connecting part of *pakata* type.



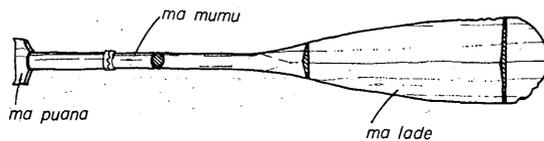
0 10 20cm

Fig. 20. Connecting part of *awa* and *bolotu* types.

they are purchased from a man in the neighboring village of Lalonga (Photo. 35). A new *pakata* costs approximately Rp. 34,000.

Unlike the *pakata*, the *awa* and the *bolotu* are dugout canoes, made by hollowing out a single log: Usually they are made by their owners. These canoes have either no vertically placed plank, as with the *pakata*, or at most a single such plank. *Ma seke* is also used for connecting spars and the float, as with the *pakata*. An *awa* is 4.7 m long whereas the *bolotu* has a length of 5.6 m. Both are small canoes built to carry 1-4 persons.

Table 7 (p. 231) classifies the canoes in Limau by number, type, age and material. There are 33 canoes, of which the majority, 23, are *awa*. There are 7 *bolotu* and 4 *pakata* in Limau. (In the table the *pelang* is put in parentheses because it comes from Sangir [North Sulawesi] and is not hence a characteristic Limau Village canoe.)



a. *pakata* type



0 1 2 3cm

b. *awa* and *bolotu* type

Fig. 21. Paddles for canoe.

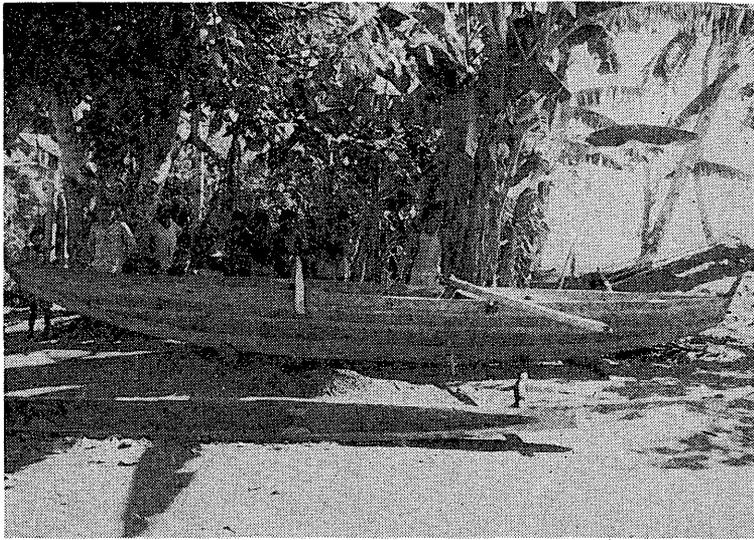


Photo. 35. Nearly completed *pakata*-style canoe. Canoe-builders of Lalonga, the neighboring village to Limau, usually are commissioned to build this type of canoe.

There are 21 canoe-owing households, 7 of which owe 2 canoes respectively. Accordingly, the total number of canoes owned in the village is 35.

Half the canoes are between 1–5 years old. One *awa* was said to be 25 years old, but this is doubtful, since some villagers say that 10 years is the maximum life of a canoe.

All timber for canoe-making is cut in the mountains. All trees cut for this purpose average 15–30 m in height, regardless of species. Canoes are made where the tree is felled. In making a canoe, the top and the base of a tree is always made to correspond to the bow and the stern, respectively. After the canoe is finished, it is dragged down to the shore with a rope, and paddled to the village. Allowing for a difference according to the size of the canoe, it usually takes a couple of months to finish an *awa* or *bolotu* and 3–4 months to complete a *pakata* (Photo. 36). The tool-kit used for canoe-making comprises a large hatchet (*pela*), adze (*patu patu*), saw (*garagaji*), axe (*basu*) and a chisel (*susuga*), among other things (Photo. 37–38). Since most of the villagers have only a hatchet and an axe, they must borrow other necessary tools from those who own them.

Canoes are used for both fishing and trading. *Awa* and *bolotu* (and *pelang*) are used mainly for line fishing, spear-fishing and fishing with a floating gill net. The *pakata* being used solely for scoop-netting. There are many canoes of the *awa* or *bolotu* type in Limau since either line fishing or spear fishing is the principal fishing technique employed.

The main trading activity of the Limau villagers is shopping every Thursday morning at Soasio. Some people also sell such items as smoked fish, copra, and



Photo. 36. Rough-hewn *bolotu* (in Limau).



(42c m)

a. Chisel (*susuga*).



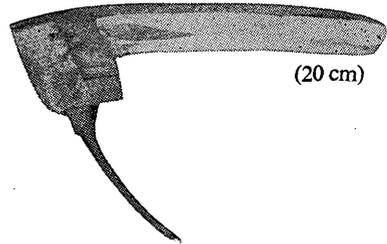
(50 cm)

b. Chisel (*sosonoto*).



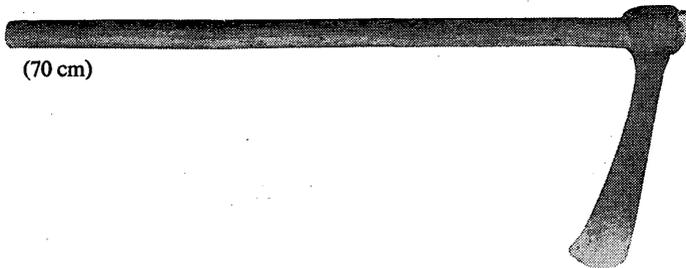
(30 cm)

c. Adze (*galo-galo*) with a narrow blade.



(20 cm)

d. adze (*patu-patu*).



(70 cm)

e. axe (*basu*)

Photo. 37. Tool-kit for canoe-making.

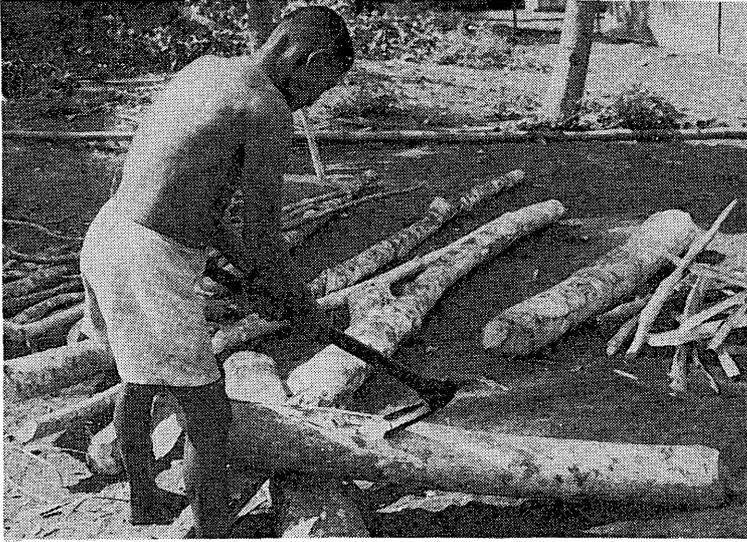


Photo. 38. Shaving wood with a hand axe.

katu. Although they formerly went to the morning market in their canoes, today they use a boat with an outboard motor. . It is the joint property of the villagers.⁵⁾ One villager personally owns a boat with an outboard motor. He seldom uses it for fishing, but reserving it for long-distance travel such as to the town of Tobelo, in Central Halmahera. Canoes may also be used for travelling to distant areas or to the mountains for lumbering.

Edible seaweeds and shellfish are not abundant in the vicinity of Limau. A canoe is a prerequisite for any kind of fishing activity, hence their close association with fishing in Limau.

2. The Traditional Canoe (*juanga*)

According to the villagers, before Islam was introduced to Limau, the Galelan had a large boat called *juanga*. Also called *kora-kora*, this boat was used for the voyage of a sultan. It was also used as a battleship when a sultan went to war. The *juanga* was a rowing boat with a capacity of 100 persons. It had a carved figure-head, consisting of a bird's head, on the prow, and a carved bird's tail at its stern. At about its middle a large, yellow triangular banner of the sultan (*pajilamo*) was hoisted, and a triangular tricolor (*koimurao*, a Ternate word) flew at both prow and stern. Prior to the arrival of the Dutch the flag was triangular and black and white, but it was changed to a rectangular red, white (symbolizing Holland) and black (designating Indonesia) flag. *Juanga*, it is said, did not have an outrigger and was propelled solely with paddles. While at sea, a watch (*sido do ulo*) stood at the prow, and the

5) This village management boat was purchased in 1975. It was the Maba (Central Halmahera) living in Bobisigo that built the boat. The boat cost Rp. 50,000 and the engine Rp. 250,000.

captain (*palihema*) was positioned at the stern. The *juanga* disappeared from the Galelan scene 35 years ago, when the last one broke down at Soasio.

III. CONCLUDING REMARKS

Fishing activities in Limau, being merely a means for "catching the fish enough for the day," occupy a secondary position among the subsistence activities. The basic food sources are agricultural products, and fish are at best secondary. Accordingly, fishing lines, fishhooks and canoes suffice for this activity. Thus, even those few villagers who own nets and other items of fishing gear often resort to hand line fishing. Trap-fishing and the use of the fish hedge, which seem to have been introduced by in-migrants, have not yet found general acceptance. There is little need or motivation for sophisticated fishing gear or new fishing techniques, and the fishing activities of the Limau villagers lack both variety and sophistication. But this does not mean that fishing is unimportant to them, rather it constitutes an essential source of animal protein.

According to Ishige (see this volume, pp. 10-15), the Limau villagers make a distinct division in identifying their living space among mountains → lowland forests → crop fields → ocean, each of which, he notes, corresponds to some kind of subsistence activities. For example, hunting and crude sago extraction correspond to lowland forests and the cultivation of various kinds of crop corresponds to the crop fields. Needless to say, the ocean abounds in fish and is a place for fishing.

The way in which the Galela recognize their living space may be alternatively understood as basically the contraposition of land and sea. If this is so, such lowland forest-oriented fishing techniques as fishing with the fish hedge or trap-fishing may be considered as somewhat outside the villagers' proper domain of fishing.

Yoshida (see this volume, pp. 24-38) discusses the space orientation of Galelans from the viewpoint of folk directions. Using the multifarious Galelan expressions of directions, he reveals insightfully the complexities involved in Galelan folk directions. He discusses fishing with a scoop net as one example of daily activities in which folk directions are overtly used. The words one hears used in scoop-netting are far more complex and precise than our expressions of daily conversation like "Over there!" or "Over here!" Drawing on these examples, Yoshida hints at the close connection between Galelan folk directions and the ocean, observing that such precise and subtle expressions are only meaningful when used on the sea, where there is nothing to block one's view.

I do not have any such convincing evidence as Yoshida puts forward to show the causal connection between folk directions and fishing activities. But that they are closely related may be seen from frequent employment of richly developed folk directions in fishing, especially in scoop-netting, and *dina* and *dai*, the canoe bow and stern respectively, and in folk directions.

Also significant is Yoshida's observation that the expressions used in folk direc-

tions are ocean-centered. Only the ocean is recognized by the villagers as the proper area for fishing activities.

In conclusion it should be emphasized that from the standpoint of material culture, both Limau fishing gear and fishing techniques are simple and the activities on the whole are fairly small-scale. This is related to the subsidiary position occupied by fish among Galela foodstuffs. Small-scale fishing and unsophisticated fishing gear and techniques are all related to the significance attached to fishing in the overall subsistence activities. But the relative significance of fishing in the overall subsistence activities is one thing; its own importance is another. In other words, it cannot simply be said that the villagers find fishing of little importance simply because their fishing gear and techniques are not sophisticated. That this is not the case should become more apparent when we reflect on the fact that Galela folk directions are basically and essentially sea-oriented.

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