



FISHERIES PROGRAMME
INFORMATION SECTION

TRADITIONAL

Marine Resource Management and Knowledge

Number 7 — September 1996

I N F O R M A T I O N B U L L E T I N



Group Co-ordinator and Bulletin Editor: Kenneth Ruddle, Matsugaoka-cho 11-20, Nishinomiya-shi, Hyogo-ken 662, Japan. (Tel: (81) 798712904; Fax: (81) 798714749; E-mail: 71351.2343@compuserve.com)
Production: Information Section, Fisheries Programme, SPC, B.P. D5, 98848 Noumea Cedex, New Caledonia. (Fax: 687 263818; E-mail: cfpinfo@spc.org.nc). **Printed with financial assistance from the Government of France.**

NOTE FROM THE CO-ORDINATOR

This issue contains two contributions on shellfish. Anna Tiraa-Passfield examines shellcraft production by women in Tuvalu and Akira Goto presents the results of his detailed study of shell money production by the Langalanga people of Malaita, Solomon Islands.

A second contribution by Akira Goto provides an outline reconstruction of some aspects of the now rapidly-changing fisheries tradition of the Langalanga.

With the permission of the author and the editor of the *Senri Ethnological Studies*, both of Dr. Goto's contributions have been abstracted from a larger study of Langalanga economic activities (see Publications section).

A note on grouper spawning aggregations at Tongareva, Cook Islands, by Kelvin Passfield concludes the contributions to this issue.

Please keep this bulletin in mind when you are writing up your reports and share your experiences with other members of this Special Interest Group. Any and all contributions are welcomed. We are interested in news, reports of recent progress (or lack thereof), formal announcements, recent publications, reviews or abstracts.

Kenneth Ruddle

Inside this issue

The use of shells
in traditional
Tuvaluan handicrafts
by Anna Tiraa-Passfield p. 2

Shell money production
in Langalanga, Malaita
Province, Solomon Islands
by Akira Goto p. 6

Some aspects of fishing
among the Langalanga
of Malaita Province,
Solomon Islands
by Akira Goto p. 12

Notes on grouper spawning
aggregations in Tongareva,
Cook Islands, June 1995
by Kelvin Passfield p. 20

Recent publications p. 21

etc...



S O U T H P A C I F I C C O M M I S S I O N

The uses of shells in traditional Tuvaluan handicrafts

by Anna Tiraa-Passfield

P.O. Box 817, Rarotonga, Cook Islands E-mail: passfiel@gatepoly.co.ck

This paper examines the collection and utilization of shells in handicraft production in Tuvalu. Of particular interest were those made by women living on the islands of Funafuti and Nukufetau (See Figure 1). These two islands were chosen for study because they are the major suppliers of shells and shell handicrafts.

Introduction

Shell handicrafts have a strong traditional significance for the people of the islands of Tuvalu. Shell jewelry used to be considered a prized possession on Vaitupu (Koch, 1983). On special occasions the men of Niutao would wear a headband woven from women's hair decorated with six or seven cowrie shells. Excavations of ancient graves on Vaitupu and Nukufetau yielded necklaces and pendants made from mother-of-pearl and cowrie shells, among other things (Koch, 1983). Today, shell handicrafts are given to relatives or friends departing Tuvalu. They are also given to guests at special functions, visiting high-ranking officials, and are worn by men and women when performing the **fatele** (a local dance).

Handicraft production has become a major-income generating activity for the women of Tuvalu. Several local women indicated that they earn up to AU\$40.00 per week by making shell handicrafts. Seventeen per cent of women over 15 years of age earn a significant income from handicraft production, averaging AU\$10.00 per week. Fifteen per cent of all income generated by women is derived from handicrafts (Tausi & Posselt, 1996).

Five main species of shell are used in handicraft production. They are two species of white cowrie (**pule kena**), *Cypraea obvelata*, the gold-ring cowrie, and *C. moneta*, money cowrie, and a black cowrie (**pule uli**), *C. caputserpentis*, commonly known as snakeshead cowrie. The money cowrie is the commonest and so the most widely-used of the species. Two species of land gastropod, both locally referred to as **misa** (*Melampus luteus* and *M. fasciatus*),

are the other shells used. Other species of shell are seldom used because they are too fragile.

At least 25 named handicrafts that utilise shells are made by women. Some items, such as necklaces, are made entirely of shells. Shells can also be used to decorate certain items, such as napkin rings, for example. The different types of shell handicrafts, their cost price and materials used in their manufacture are listed in Table 1 on page 4.



Figure 1: Map of Tuvalu

Collection and preparation of shells

Shells are collected mainly by women and children. The handicrafts using **misa** are usually made in Funafuti from shells collected locally. Although the three species of **pule** (cowries) are found in Funafuti, they are uncommon on the main islet, where most people live. I was told that they are fairly common on the uninhabited islets. However, a boat is needed to reach them, thus making it harder for women to harvest shells there. **Pule kena** and **pule uli** are the main shells harvested in Nukufetau. **Misa** is also collected, but is mainly used for decorating some handicrafts.

Misa

Misa collection was observed on Funafuti, where they are collected by women and children. These shells are found in shady moist areas under coral rubble and debris on land. Apparently the best times to collect them are when it is rainy or on nights with a new or first-quarter moon. At these times **misa** move to the surface of their shelter, making collection easier. Collection at other times involves sorting and turning over coral rubble.

Misa are usually collected into a plastic bottle with a lid (if there is no lid, rolled tree leaves are used as a stopper). A kerosene pressure lamp is used for night collecting.

After collection, some women kill **misa** by pouring hot water over them. They are then transferred to a 20 kg flour sack, which is put in a shady place out of the direct sunlight, to prevent the shells from losing their lustre. If **misa** are not killed immediately they are left in the sack to die. Some women bury them instead, and the meat is eaten by various insects. After about a week the shells are washed and cleaned in the sea. They are then rinsed in diluted bleach to remove any smell.

Holes are made in the shell with a nail attached to a piece of wood. A shell is secured firmly in a cavity in a piece of a coral rock, and then the nail is pushed gently but firmly through the shell. Depending on the type of handicraft to be made, one or two holes are made in particular parts of the shell. The shells are then threaded with either nylon fishing line or local material, such as **taa** (see glossary).

Pule kena and pule uli

I observed the collection and preparation of **pule kena** and **pule uli** on the island of Nukufetau. **Pule kena** is collected with bare hands at low tide. This shell occurs mostly under coral rocks in intertidal pools on the lagoon reef flat. The best times to collect **pule kena** is at low tide when it is rainy or at night. At these times the animals make their way to the surface of the rocks.

The mid-rib of an old pandanus leaf is used as a tool to remove the **pule kena** from holes in the coral. The live shells are collected in a can or a plastic container, such as a bowl. When collecting at night, a kerosene pressure lamp is used. Collectors normally stay out for 2–3 hours, during which time they can collect 500 or more shells.

When I observed the collection of **pule kena**, rocks were overturned to remove the animal from them. The rocks were not returned to their original position. I counted between 5 and 15 **pule kena** per rock of dinner-plate size.

Pule uli are normally collected on an outgoing tide on the outer reef. They are collected mainly by women. They are best sought when it is sunny, because the dark colouring of the shell reflects the light, making it easier to see them.

The preparation of **pule kena** and **pule uli** is very similar to that of **misa**. However, instead of being rinsed in diluted bleach they are soaked for a day in a bucket of fresh water.

Pule kena and **pule uli** are hard shells. I observed hole-making using a nail tapped with a pair of pliers.

Marketing

Few tourists visit Tuvalu. The major buyers of shell handicrafts are therefore Tuvaluans, with shell necklaces being the most popular items.

The major outlet for women's handicrafts is the Tuvalu Women's Handicraft Co-op. Ltd. (Handicraft Centre). The main centre is in Funafuti, with branches on most of the outer islands. The Funafuti centre buys handicrafts once a week from both women and men. There are about six private retailers who also buy handicrafts, mainly necklaces. They sell their goods mainly outside the airport, when the plane calls into Funafuti.

Table 1: Handicrafts made with shells in Tuvalu

Handicraft name	Description	Price AU\$	Materials used
Shell necklaces (Tui) Pule pepe ¹	Butterfly	1.90	pule kena, pule uli , plant seeds (fuaga uli) or misa for decoration; nylon fishing line
Tui fafetu ²	Star	2.60	as above
Tui fafetu tonga ³	Star	1.90	as above
Tui masela ⁴		1.90	misa uli or pule kena, lau kie (fine pandanus leaves) coloured using local or imported dyes, raffia (polypropylene film), wool, cardboard and nylon fishing line
Pule feitu tasi	Triangle	1.70	pule kena or misa , nylon fishing line, misa or plant seeds for decoration
Pule fakavasa	Double strand	1.90	pule kena and nylon fishing line
Tui misa tuatasi	Single strand	0.80	misa and nylon fishing line
Tui misa tualua	Double strand	1.30	as above
Tui misa fakavasa	Double strand	1.90	misa kena, misa uli , nylon fishing line
Tui misa fuli ki lotu/tua	Spiral		
Pendants (Malele) Malele kena pule tasi	Single flower	2.00	pule kena , plant seeds, coloured or plain taa
Malele kena pule tolu	Three flowers	2.50	as above
Malele kena pule uli tasi	Single flower with black cowrie	2.00	pule kena, pule uli and taa
Malele paa ⁵	Bonito hook made of mother-of-pearl	3.00	Mother-of-pearl shell and kolokolo (coconut sennit)
Hair clasp (Pine ulu) Pine pule/misa		1.80	pule kena or misa , cardboard, taa or raffia or lau kie (fine pandanus leaf), togo (<i>Rhizophora mangle</i>) or gie (<i>Pemphis acidula</i>)
Brooch (Pine faka mau gatu) Pine faka mau gatu misa		0.80	misa , safety pin, taa or nylon fishing line
Pine faka mau gatu pule		0.80	pule kena , safety pin, taa or nylon fishing line
Headband (Fou)		1.70	woven lau fala (pandanus leaves and lau kie (fine pandanus leaf) usually coloured with local dyes), misa or pule or both, nylon fishing line or very fine kolokolo (coconut sennit) or taa , needle to thread taa or kolokolo
Earring (Ligi) pule/misa		2.00	earring hooks, pule kena or misa or both, or pule uli , nylon fishing line or taa
Door curtain (Pui mataloa)		30.00	pule or misa nylon fishing line
Belt (Fusi) Fusi pule		3.30	pule, lau fala , dyed lau kie , nylon fishing line or taa
Fusi misa		2.20	misa, lau fala , dyed lau kie , nylon fishing line or taa or fine kolokolo
Napkin rings (Mea fao sologutu pule)		3.00 per set	pule kena, lau fala, taa or nylon fishing line or fine kolokolo
Basket (Ato pukupuku pule)		5.00	pule kena , nylon fishing line
Vase (Teu pule)		12.00 big 3.00 small	pule kena , nylon fishing line and sometimes misa for decoration

¹ Twenty-four inches is the standard length of the strand. A strand consists of about 80 **pule kena**.

² Twenty-four inch strand. The star is made up of 65 small **pule kena** and 5 **pule uli**.

³ Star without the pointed tips, edge of star arms rounded.

⁴ Has its origin from the Marshall Islands.

⁵ Traditionally, the masterfisherman of Niutao wore a necklace of mother-of-pearl shell bonito hooks. Each hook represents an occasion when 100 or more tuna are caught by the masterfisherman at one time (pers. comm., Laisini).

Three times a year the Funafuti Centre orders cowrie necklaces through its branch in Nukufetau. Each order is usually for about 200 pieces. Each woman is limited to no more than 20 necklaces, in order to be fair to the suppliers. However, it is not uncommon for the women of Nukufetau to send their goods on the inter-island ship to relatives in Funafuti for them to sell on their behalf. They are sold either to the Funafuti Centre or to private retailers. Table 1 lists the cost price of shell handicrafts. The retail price is determined by adding a 30 per cent mark up.

Unworked shells (**misa** and **pule kena**) are also sold either to the handicraft centre or to private retailers. They are bought by the center for \$5.00 per bag of 1,000 shells. The retail price for all bags of shells is \$7.20. **Pule uli** are sold individually depending on size. The price ranges from 6 to 10 cents each.

In Nukufetau, where most of the cowrie shells come from, the **pule kena** is sold by the 500 g 'Irish Cake' tobacco can, which holds about 1,400 shells. They are sold to the Handicraft Centre for \$5.00 per can or to private retailers for \$7.00. I was informed that it is easier for the women to sell the **pule kena** in a tobacco can than to count out the 1,000 shells required for bagged sales.

The **tui fafetu** and **tui pepe** are the most common shell handicrafts made in Nukufetau. They are also the most profitable. Approximately 150 **pule kena** and 5 **pule uli** are used in making the **tui fafetu**. About 10 **tui fafetu** (each worth \$2.60) can be made from one tobacco can full of **pule kena**. Each can of **pule kena** is therefore worth about \$26.00, compared to the \$5.00 or \$7.00 obtained for the unworked shells.

The export of shell handicrafts for sale overseas is limited, although most leave the country as gifts with departing friends and relatives. It is not unusual to see 10 or more necklaces around the necks of departing passengers. The Handicraft Centre exports some shell goods to 'Jack's Handicrafts', in Fiji. I was also informed by a handicraft producer that recently one of the private retailers has established a market in Western Samoa. Table 2 shows the value of handicrafts sold through the Handicraft Centre during the period 1990–1995.

These data most likely underestimate the sales of goods from Nukufetau, and overestimate those sold through the Handicraft

Centre for Funafuti. This is because many of the necklaces and other items sold directly to the Centre by women on Funafuti may have come from relatives in Nukufetau, and would be misrepresented in the data as originating from Funafuti. Sales through the private retailers are also not accounted for.

Table 2: Value of handicrafts through the Women's Handicraft Centre, 1990–1995

Year	Total value in AUS	
	Funafuti	Nukufetau
1990	1564.55	416.40
1991	5777.20	3364.58
1992	7962.30	3413.52
1993	9176.90	834.56
1994	3535.59	2864.66
1995	3216.10	1913.92

Management

The National Government has no regulations covering the collection of shells. However, in 1994, the Nukufetau **Maneapa** ('Council of Elders') placed a verbal ban on the export of unworked **pule** and **pule uli** from Nukufetau. It did not include the export to Funafuti of handicrafts using these shells. Previously, large quantities of shells were collected for relatives in Funafuti to produce handicrafts for sale. The local economy missed out on revenue made from the sale of the goods. The ruling effectively encourages 'value adding' to the raw material on Nukufetau. Although no fines are imposed, an offender can expect to be called to the **Maneapa** to receive counselling from the elders.

Acknowledgements

I would like to thank the following people on Funafuti and Nukufetau, who graciously gave their time and hospitality to assist me write this paper. In Funafuti: The staff of the Tuvalu Women's Handicraft Co-op. Ltd., especially Tepalu T. Lemeke, Manageress of the Handicraft Centre, who provided much of the information contained in this paper, Margalita O'Brien who took me **misa** hunting, Makaina T. Paolo who showed me how **misa** shells are prepared to produce handicrafts. In Nukufetau: A special thank-

you to my main informant, Senitenati Taliu, the Island Council of Nukufetau, Faasi Sopoaga and the people of Nukufetau whose hospitality was given in true Pacific style. Shell identifications were done by Terry Lambert and Ed Saul, on Rarotonga. Lastly I thank my husband for his encouragement. *Fakafetai lasi*

Glossary of common local names

Misa: *Melambus luteus* and *M. fasciatus*.

Pule kena: *Cypraea obvelata* and *C. moneta*.

Pule uli: *Cypraea caputserpentis*.

Taa: Processed pre-emergent coconut leaves, those tightly packed together in the coconut 'spike', known as 'rito' in the Cook Islands.

Tui fafetu: A shell necklace made of **pule kena** and **pule uli**. The central pattern is a star.

Tui pepe: A shell necklace made from **pule kena** and **pule uli**. The central pattern is in the form of a butterfly.

References

KOCH, G. (1983). The material culture of Tuvalu. Institute of Pacific Studies, the University of the South Pacific, Suva, Fiji. (English translation by G. Slatter of Koch, 1961).

TAUSI, M. & H. POSSELT. (1996). Tuvalu Household Income and Expenditure Survey (HIES), 1994. Central Statistics Division, Funafuti.

Shell money production in Langalanga, Malaita Province, Solomon Islands

by Akiro Goto¹

Introduction

Shell money has been one of the most important cultural items in Melanesia. There are several types: cowrie shells, beads, rings and drum-shaped, among others. The cowrie-shell type also occurred in mainland South-East Asia and East Asia and has been an important item for exchange and accumulation in Papua New Guinea. Shell beads can be used both as ornamentation and as money. This type is widely distributed in Melanesia, occurring in Papua New Guinea, the Bismarck Archipelago, Solomon Islands, New Caledonia and Vanuatu. In Western Province (New Georgia) of Solomon Islands, ring-type shell money (**poata**) was used. **Poata** is a large 7–15 cm diameter ring made from giant clam shells, and used for bride price and exchanged for slaves, stones, bark cloth, shields, necklaces and bird eggs. In the Choiseul Islands of Solomon Islands a drum-shaped money (**kisa**) made of giant clam shells was used. It had different exchange rates according to size (Miller, 1978).

Langalanga, of Malaita Province, Solomon Islands, is among the few areas where shell money is still produced. The approximately 2,000 Langalanga people inhabit the Langalanga Lagoon area of the central west coast of Malaita Island, one of seven provinces that comprise Solomon Islands (Fig. 1). For the study of resource use and shell money production among the Langalanga, I stayed for about a total of three months in Abalolo village¹. Abalolo villagers subsist mainly by fishing, gardening or collecting. Their main marine resource zones are the sea beyond the reef, outer islands, reefs around outer islands or, in the lagoon, the lagoon itself and coastal reefs. Their terrestrial resource zones are the coastal plain, mangrove between villages, rivers, river terraces and mountain slopes.

Shell-money production in Langalanga

The Langalanga produce the shell-bead type of shell money, which occurs widely in Central Solomon Islands. Four species of shells are used: **romu** (*Chama pacifica*), **ke'e** (*Begonia semiorbiculata*), **kakandu**

1. Department of Cultural Studies, Miyagi Women's College, 9-1-1 Sakuragaoka, Aoba, Sendai 981, Japan

2. 11 August – 12 September 1990, 30 July – 31 August 1992 and 25 April – 31 May 1994.

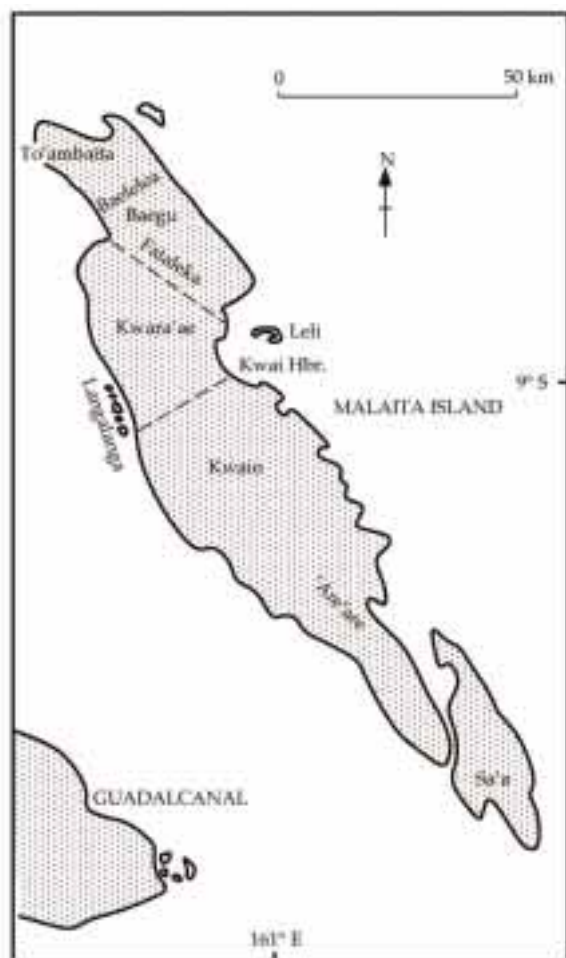


Figure 1: Malaita island

(*Anadara granosa*), and **kurila** (*Atrina vexillum*).

Shell beads are produced as follows. Shells are crushed with an iron hammer on a flat stone (**fou-li-ui**) to remove the hinges and other useless parts. Shell fragments (**kwai fuloa**) are then held with fingers and retouched with hammers, to make approximately 1 cm diameter round disks (**didia suiro**).

Disks of **romu** and **kakandu** shells, which retain a rough surface, are then smoothed on concave pieces of limestone (**fou-li-safa**). About 40–50 disks are placed on a half-cut smoothing stone (**ma'ai**), and are smoothed on the **fou-li-safa** by pushing down and moving the **ma'ai** with both hands. Water and crushed sandstone are used as grinding agents.

All disks are then drilled in the middle, from both sides. Traditionally, pump drills (**futa**) were used, but these have been replaced by more efficient store-bought

hand-drills. Drilled disks (**kwakwa suiro**) are then pierced and strung together, a process called **urufia**. At this stage the disks can be used as shell money, but usually they are polished into smaller beads.

To make beads, strings of shell disks some 3 m long are placed on an elongated wooden stand, and ground with polishing stones. This is the hardest work in the production process, and is often done by males. It yields round beads with diameters of 3–5 mm.

Beads of **ke'e** shell are then burned on an iron plate heated on a stove, to change their colour from dark purple to orange. This process, called **para**, and is one of the most important steps in shell money production.

If not heated enough, beads become improperly coloured; if heated too much they become too white, and so useless. The colour of **ke'e** shell is an important factor for the value and price of several types of shell money.

Shell money is produced in households by women. Children often help their mothers to reshape and drill the discs. But polishing strung shell beads is men's work, although women do it occasionally. Men and children also string shell beads. In 1990, only women were observed burning **ke'e** shell beads, but in 1992, I noted that men occasionally do this work.

Kinds of shell money

The Lungalanga people make various kinds of shell money, both for themselves and for other tribes. Their indigenous shell money used for bride gift is **isae galia**, made only of white beads of **kakandu** shell.

Isae galia are made of ten strings (**fula**) of **kakandu** shell beads with a diameter of about 10 mm. Each string is folded twice in the middle before being bundled. Thus **isae galia** appears to be made of 40 strings that are about 50 cm long. Since **isae galia** is the proper shell money for the Lungalanga people, they hesitate to sell it to outsiders.

The shell money produced in Lungalanga and distributed widely throughout the island is **akwala afu**. **Akwala afu** means

'ten (strings) together' in the Langalanga language.³

Akwala afu is subdivided into several types according to length, measured by parts of the human body: **awae-rarate** ('tip of the chin'), **obe-susu** ('over the chest'), **tari-bo'o** ('reaching the navel'), **gwae-uruuru** ('reaching the knee'), and **buigao** ('standing in the middle'). The longer the **akwala afu**, the higher the price.

A special type of **akwala afu**, **maifuo** ('net of diamond shape') is the most valuable shell money made by the Langalanga. To make **maifuo**, ten strings are combined into a net shape in the middle. On each string white (**kakandu**), black (**kurila**) and red (**ke'e** or **romu**) beads are arranged according to strict rules.

In former times only **romu** shells seem to have been used for red beads, but **ke'e** beads are substituted nowadays. However, **romu** beads are preferred in the middle part of strings. In particular, the netted parts of **maifuo** must be made from **romu**. The Langalanga are especially careful of the quality of **romu** shell. The most valuable kind is called **firai** and has a salmon pink colour. **Romu** shell lacking enough colour for shell money is called **romu ko**. A **maifuo** made only of **firai** is called **bata firai**. Such **maifuo** has a legendary reputation.

Several parts of **akwala afu** are distinguished according to the kinds of shell beads used. From the middle to the end are the **firai romu**, **lige bata ke'e**, **lige kurila**, **lige bata ke'e**, and **lige furu** (**lige** = side). **Lige furu**, at both ends of each string, consists of white and black beads arranged alternately. But the diameter of the black beads is smaller than that of the white beads. This imbalance looks strange, since the diameter of beads on one **akwala afu** should be the same. This has arisen because the black **furu** beads were formerly made of plant seeds named **furu**, but black shell beads with a small diameter have been substituted for original materials that are no longer obtainable.

Except for the **furu part**, the beads in one **akwala afu** all have the same diameter. But the Langalanga distinguish between **bata baela** ('big money') and **bata wawade** ('small money'). The beads of the former have a larger diameter. Among the Langalanga both types have equal value, but the Lau people seem to prefer **bata baela** to **bata wawade**, because they believe that since the former is newly-made shell money, it becomes **bata wawade** after being used for generations and so worn down. (However, **bata wawade** requires more labor than **bata baela**, since it requires more polishing.)

The shell money made most frequently in Langalanga is **safi**, which consists of a single string of **ke'e**. **Ke'e** is used among Kwaio and 'Are'are people, in the south of the island. They obtain **safi** from the Langalanga and rearrange them into their own shell money. When finished, strings of **safi** are either taken to the Honiara market and sold, or exchanged locally with the Kwaio and 'Are'are people.

For the Kwaio tribe, Langalanga people make several types of shell money⁴. I observed the production of **fafa'a** and **bani-au**. **Fafa'a** is made of small white snail shell (**soela** in Langalanga, and **mamalakwai** in Kwaio). **Bane au** has six strings of **ke'e**, **kakandu** and **kurila** beads. Unlike **akwala afu**, this shell money is not symmetrical: one side is **ke'e/kakandu**, and another side is **kurila/kakandu**. The former is called 'head' and the latter 'tail.'

For people on Guadalcanal, the Langalanga make yet another type of shell money, **talina**. This type has three strings of **ke'e**, **kakandu** and **kurila**. Unlike **akwala afu**, **talina** has **kakandu** with **kurila** beads in the middle.

Bride gift and functions of Langalanga shell money

Isae galia and **akwala afu** are used today as bride gift and for other purposes, like funerals. **Akwala afu** is also used to obtain important items, such as pigs, canoes and yams from other tribes.

3 It is known as *tafulia'e* among the Kwara'ae and Lau, a more widely-used name (e.g. in Solomon Islands National Museum exhibitions) than the Langalanga term.

4 In 1994, I observed shell money production in the Kwaio village of Kwa'a. There women were drilling and stringing white snail shells (*mamalakwai*) but men were responsible for arranging the shell money for bride gift. The kinds of shell money used among the Kwaio are: *lakwalaka* (one string of *mamala kwai*), *genilabi* (2 strings), *sauoru* (3 strings), *fafa* (4 strings), *nima ae* (5 strings), *bani-au* (6 strings), *ono galia safi afuafu* (6 strings with red *safi*), and *fiu galia* (7 strings mixed with *safi* and *mamal kwai*).

In Langalanga, the boy's family has to pay engagement money (**galina**) to the girl's. **Galina** means 'to close (or taboo) the girl to other boys.' If the engagement is set, the boy's side starts accumulating shell money for bride gift (**kwatena**)⁵.

Traditionally, only **isae galia** was used for bride gift, but nowadays both **akwala afu** and **isae galia** are used. The Langalanga regard two **isae galia** as equal to one **akwala afu**, although the cash price of the latter is much higher than the former. They count the number of **akwala afu** by recalculating it by the number of **isae galia**. The amount of shell money paid for bride gift is negotiated beforehand between the two sides.

In addition to the bride gift, **wainuma** must be paid to the girl's mother, to express special thanks to her for having raised the girl⁶. A **maifuo** should be used for **wainuma**.

On the day of the engagement payment, the boy's relatives go together to the girl's village. Shell money is placed on the ground in front of the girl's house, where a specialist is usually employed to count it. After the engagement payment has been made, a refund (**du'una**), consisting either of shell money, strings of **isae galia** or cash, is paid by the boy's relatives to those of the girl.

Shell money production in transition

Cooper (1971) noted that shells for production of money were exhausted in the late 1960s, since the Langalanga were either buying shells from other areas or going elsewhere to collect them. The situation seems worse now. Although **ke'e** and **romu** can still be collected in Langalanga Lagoon, supplies are insufficient. During one month in Abalolo in 1990, I observed that village women went diving for these shells only once. In 1992, I noted that one villager paid a diving specialist to collect **romu** shells from deep beds near the mangrove.

Nowadays, people usually buy bagged shells in the Honiara market. Each bag is supposed to contain 25 kg. **Romu**, the most valuable shell, is sold by the piece. Shells are also sourced from Malaita and neighbouring islands, as well as from such distant islands as New Georgia.

Among the three basic elements for shell money (red, white and black), the red shells seem to be the most crucial. Traditionally, the fishing grounds of **romu** shell were strictly managed, and only men who observed proper rituals could dive for them. But **romu** is now too scarce and expensive, so **ke'e** shells are used for all except for the central part of **akwala afu** and **maifuo**. But recently **ke'e** shells also have become expensive.

The red elements of shell beads other than shell money tend to have been replaced by non-traditional shells, such as **se'ere**, small snail shells with a red interior part. For instance, I have collected **sau-sako** (chest band for ceremony) and modern necklaces made with red beads of **se'ere**. This process of replacement of materials appears to have begun with peripheral items or those for informal use and is proceeding toward central items or those for more formal use.

Modern necklaces and other ornaments that are either worn for personal adornment or sold as souvenirs seem to have the least strict rules for production. As a result products with totally new elements, such as a purple element made from sea snails, are now being produced. Technological change does not appear to occur simultaneously for all the products or parts. For shell money, production of which is under strict rules, the speed of change is slower than for other items.

Tools used to make shell money are also changing. Nowadays store-bought iron hammers are used to crack and shape shells. Traditionally long pebbles collected in the rivers were used. Traditionally, too, pump drills (**futa**) were used for drilling. They were made of wooden sticks with disks of turtle bone. A pointed flake of chert (**ladi**) was attached to the end of the stick. Polishing was traditionally done with sandstone from the rivers, but nowadays store-bought grinding stones have been substituted.

Shell money was produced either for marriage of families and relatives or for exchange of important items. Thus production labour was not evaluated in cash. But nowadays some villagers temporarily employ others, usually women, for shaping and drilling shell beads. Men are often

5 Kwatenah has been translated as 'bride price' by Westerners, but the villagers prefer to translate the term as 'bride gift'.

6 The same custom was reported among the Lau (Ivens, 1930: 95–96).

employed for polishing. The pay is \$1.50 to drill a 200 g fish can full of shell disks, and about \$3.00 to polish a string of **safi**.

Since 1990 drilled **ke'e** disks have been sold at the village store at \$0.20 for 30 disks. Villagers sell **ke'e** disks to the store, and then buy items with the money. Traditionally, shell beads obtained a value only after being properly arranged into shell money, but nowadays they constitute a form of cash among the Langalanga. For example, in 1992 one household killed a pig, and sold pieces of meat to other villagers, some of whom paid with strings of **ke'e**. In Gwa'edalo, one man buys shells for shell money, and distributes them to the other villagers. He then pays cash for drilled disks returned to him. Thus it is evident that a small-scale division of labour and a cottage industry are emerging as a new form of shell money production.

Economic efficiency of shell money production

By the 1960s Cooper (1971) had already observed that the shell-money production of the Langalanga was in transition. Shell money is one of a few ways that the Langalanga can obtain cash. My time-allocation (Goto, 1996) study demonstrated that people spent 2–5 hours a day at this work, and that both men and women devote most of their time to shell-money production. Thus it is by far the most important economic activity among the Langalanga, and the penetration of the cash economy must have had a profound social impact.

One of the most important changes is that shell money itself can now be sold for cash; each type has a specific price, so the value of shell money has come to be equated with cash. Shell money together with shell ornaments can be either sold locally or taken to the Honiara market for sale.

To estimate the economic efficiency of shell-money production, I measured the time spent for each stage of **safi** production, except for polishing (which takes several hours), estimated the average number of shells contained in one rice bag, counted the number of tablets made from a half shell, and estimated the wastage rate during the production process. In this way I estimate that it takes about 14–15 hours to finish one string of **safi**, and that about 10 strings of **safi** can be made from one rice bag of **ke'e**.

(These estimates accord well with those made by villagers interviewed on the topic.)

Since one string of **safi** is sold for \$30.00, one hour of shell-money-production labour is worth \$2.75 (after the purchase price of the **ke'e** is deducted). But this is an estimate of ideal situations, since it assumes that the rice bag is full of shells, whereas they usually contain less than 25 kg, and that the wastage rate during production of shell tablets is only a minimal 10 per cent. But in reality other factors reduce the profitability of production labour. First, several tools must be purchased; rubbing stones (one stone for 6–10 strings of **safi** costs \$3.00–6.00), strings (40 yards for \$1.80), drills (\$20.00 each), and drill-needles (\$2.00 each). If the final product has to be taken for sale in Honiara, transportation costs and living expenses are incurred. Further, not all the purchased shells are made into shell money for sale. Some shell money is retained for traditional exchange or for gifts, and some shells are used to make ornaments for the maker's own use. Given these additional factors, the profit from shell-money production is much lower, probably around \$1.00 per hour of labour input.

Conclusions

The Langalanga have retained a central role in the local Malaita economy (*cf.* Ross, 1978). In the exchange economy between the 'sea' and the 'bush' peoples, the Langalanga, together with the Lau, have traditionally supplied marine resources to the inland tribes. In particular, the Langalanga have been the sole supplier of the shell money that has been the keystone in social transactions.

The Langalanga make shell money (**isae galia**) for use among themselves. At the same time they also make shell money (**akwala afu**) both for exchange within their society and for trading with other peoples for a restricted range of items (e.g. pigs, canoes, yams). The Langalanga also make the shell money or string (e.g. **safi** for the 'Are'are and Kwaio and **fafa'a** for the Kwaio) purely for exchange. The penetration of the cash economy into this system has thus created a new cycle of exchange: 'shell money fi cash fi a wide range of items.' In addition, among the Langalanga shell beads (before being composed into shell money) have entered this new cycle as a kind of cash.

Unlike other areas, where shell money production has ceased (e.g. Belshaw, 1950), shell-bead craft (i.e., making shell money and ornaments) among the Langalanga has thus been accommodated within on-going socio-economic changes. Although shell money as 'bride gift' is still the basis for social bonds among the Langalanga, this craft has attained economic importance under the increased influence of the cash economy (Cooper, 1971). The availability of local raw materials for shell beads has diminished, so that shells must now be supplied from other areas. In addition, the introduction of new tools, such as drills and polishing stones, has increased productive efficiency.

Analyses of food consumption indicate that introduced foods, such as rice and canned fish, have become increasingly important in local diet. To purchase these requires cash, so more time is spent making shell beads. But even more cash is required to cover the increasing cost of shells and to purchase tools.

Analyses of time allocation (Goto, 1996) demonstrate that the time spent on shell-bead production competes with the time required for other productive activities, such as gardening and fishing. Since commercial fishing is still underdeveloped, the shell-bead-production craft is almost the only way of coping with the penetration of the cash economy.

The concentration of the younger generation, especially single women, on shell-bead craft could lead to a decrease in gardening and collecting. Young men tend to migrate to Honiara to seek wage labour. One of the serious effects of this is the declining interest in managing gardens and fishing grounds.

As elsewhere in Melanesia, Langalanga society is in transition. Although many societies have given up their indigenous technology, the Langalanga continue shell-bead production. Moreover, to cope with socio-economic changes they seem have become increasingly dependent on this traditional craft.

Acknowledgements

The research on which this paper is based was funded by overseas scientific grants from the Japanese Ministry of Education, Science and Culture (1990, 1992) and the

Tohoku Development Memorial Foundation (1994). Research permission was granted by the Solomon Islands Government, and was made possible by the Ministries of Fishery, Education, and Natural Resources of the Solomon Islands Government, and by the respective sectors of the Malaita Provincial Government.

I am grateful to all those persons in Solomon Islands who helped me during my research. In particular, I wish to thank the Premier of the Malaita Provincial Government and the officials of respective sectors. I am greatly indebted to Rinaldo Walesua, of the Ministry of Fisheries, and to Fisheries Official Andrew Toritelia for arranging my fieldwork in Langalanga. I am also grateful to Shigeru Shimura (JAICA) and Tokuro Watanabe (JOCV) in Honiara, and Yoshihiko Nishimura (JOCV) in Auki.

Finally, I express my deepest gratitude to all the Abalolo villagers and Langalanga people for their enormous hospitality and friendship.

References

- BELSHAW, C.S. (1950). Changes in heirloom jewelry in the Central Solomons. *Oceania* 10: 169-184.
- COOPER, M. (1971). Economic context of shell money production in Malaita. *Oceania* 41(4): 266-276.
- GOTO, A. (1996). Lagoon life among the Langalanga, Malaita Island, Solomon Islands. In: T. Akimichi (ed.). *Coastal Foragers in Transition: Senri Ethnological Studies No. 42*. Osaka, National Museum of Ethnology. 11-53.
- IVENS, W.G. (1930). *The Island Builders of the Pacific*. London, Seeley, Service & Co. Ltd.
- MILLER, D. (1978). Organization approach to exchange media: an example from the Solomon Islands. *Mankind* 11: 288-295.
- ROSS, H.M. (1978). Baegu markets, areal integration, and economic efficiency in Malaita, Solomon Islands. *Ethnology* 17: 119-138.

Some aspects of fishing among the Langalanga of Malaita Province, Solomon Islands

by Akira Goto¹

Introduction

The Langalanga people, who inhabit the Langalanga Lagoon area of central-western Malaita island, Solomon Islands, have an extensive local fishing knowledge and technology. But under the pressure of recent cultural change much of this tradition gradually became lost. Abandoned fishing methods include the stone weir (*afeafe* and *ere'ere*), the fish-drive (*rarabu*) using coconut leaves, fish-poisoning, kite-fishing (*kwaferao*), and angling with a straight hook (*iana*). I attempted to reconstruct an outline of Langalanga fishing lore by interviewing skilled fishermen and examining remaining examples of fishing gear no longer used.

The daily gathering of marine resources provides the Langalanga with a stable food supply. Women go to mangrove zones to collect *ko'a* as well as such shellfish as *ke'e* (*Beguina semiorbiculata*) and *iloilo*. In the shallow reefs around the village and islands in the lagoon, women dive for such shellfish as *wera* (*Conus* sp.), *nau* (*Millepes* spp.) and *ralili* (*Marmorostoma* spp.). On the reef flats of the outer islands, a variety of crabs are caught. These shellfish and crabs are important supplements for the relatively unstable finfish catch.

Gear types

(1) Stone weirs

Formerly, the Langalanga constructed two types of stone weir, usually on the reefs of outer islands: the *afeafe* (with high walls) and the *ere'ere* (with low walls). The latter was used at low tide. Fishers removed part of the wall to release the fish, which were then caught in a round scoop net (*atola*) as they exited. The main catch comprised *uala* (sardine, *Amblygaster* spp.), *dolala* (mackerel, *Rastrelliger kanagurta*), *mela* (perch, *Caesio* spp.), *alubala* (rabbitfish, *Oplegnathus* spp. and *Siganus* spp.), and *suru* (emperor, *Lethrinus* spp.). Most stone weirs were damaged by cyclones and subsequently aban-

doned. Using aerial photographs I located two *ere'ere*, and visited one near Radefasu.

(2) Nets

The Langalanga used several kinds of nets (*fu*). I observed two types of scoop net, one with a round frame (*la'e*) and another with a four-sided frame (scaff-net, *gale*). Both types were used in the shallow water. Four types of net are still used in the lagoon, an encircling net for *uala* in reef channels, the drive-in net, an encircling net for night-fishing at the river mouth, and 'blocking' nets. The blocking net is used in the river mouth at high tide. At low tide, several canoes go up the river and then drive the fish downstream into nets. In 1990 I observed that a few groups used encircling nets and a blocking net in the river mouth to catch fish for sale.

(3) Spearing

Spears (*fakarau*) with four iron points are used in the mangroves on the rising tide. Spears with short shanks or spear-guns are used for dive-fishing (mainly at night) to catch *gwaile* (parrotfish, *Scarus* spp.), *bolo* (surgeonfish, *Acanthurus* spp.), *ume* (unicornfish, *Naso* spp.), *gome* (mullet, *Mugil* spp.), and turtles. Some fishers use lamps (*iroiro*).

(4) Angling

The commonest fishing method is angling. Formerly it was done using lure hooks made of shell shanks, or with baited hooks made of bone, shell and metal. Lure hooks were mainly used for *rau* (bonito, *Katsuwonus pelamis*), and bait hooks were used, according to size, for either deep-sea fishing or for fishing in the lagoon. Baited hooks were traditionally attached to the end of the leader, below the sinker. Nowadays, influenced by the Japanese method, the iron sinker is placed at the bottom. *Uala* fish and *kokoro* shell are regarded as good bait (*mamu*). Fish-hooks are now imported from Japan, and most are the U-shape type with barbs. The Langalanga distinguish two types of hooks,

1 Department of Cultural Studies, Miyagi Women's College, 9-1-1 Sakuragaoka, Aoba, Sendai 981, Japan

oigege (bent point) and **oitoro** (straight point).

Small hooks, **filau wawade** (No. 9 hooks; shank length 2–3 cm) are used to catch **uala** and **mela** (fusiliers, *Caesio* spp.). Because they shine they also serve as a lure; fishers just pull up and down on the line and the **uala** are attracted. The same and longer types of hooks (No. 5 hooks) are used on bright nights for **buli** (squirrelfish, Holocentridae). Fishers attach two to five unbaited hooks, 50 cm apart, on the line. During the bright night and on the high tide they drift the line to catch **buli** and **duli mou** (Apogonidae).

For catching **baraulo** (barracuda, *Sphyræna* spp.), **karaona** (snapper, *Lutjanus* spp.), and **mamalo** (threadfin-bream, *Pentapodus* spp.), medium hooks, **fanaruga** (No. 1-2 hooks; shank length 3–4 cm) are used, often with a wire leader. This type of fishing is done in water channels at night.

Large hooks (**lofo lae**) are used for deep-sea angling of such large fish as **ia bala** (emperors, Sparidae and *Paracaesio kusakarii*), **tori** (snappers, Lutjanidae) and **malifu** (snappers, *Lutjanus* spp.). Deep-sea fishing (**talamae kwalo**) with lure hooks with a white plastic shank has been done for several years. This method, known as **kura**, is said to have been introduced by Filipino fishers. The Langalanga have started to use round-shaped hooks that Japanese fishers use for tuna longlining.

Aspects of fishing activities in Abalolo Village

Of the fishing techniques described above, I observed in Abalolo Village angling in deep sea and the lagoon, spearing, netting, and collecting (including diving) for marine invertebrates. In 1990 no villager owned a net, but in 1992 one household had a seine net (*cf.* Laumani, 1989) used for fishing on the reef flats around the outer island.

Fishing is primarily for household subsistence, although casual exchange between villagers occurs. In 1990, one villager, using ice boxes provided by the Japanese Government, started to buy fish from other villagers and transported them to the Honiara market. However, by 1992 the enterprise had failed owing both to an insufficient supply of ice from the Division of Fisheries and the irregularity of transportation from Abalolo Village to the provincial capital of Auki, where there is a boat connection to Honiara.

In 1990 no beche-de-mer fishery existed in Langalanga Lagoon, but fishing so quickly developed subsequently that by 1992 the resource had already been overexploited near Abalolo village, and the fishery had already ceased. But in Ailau and Gwa'edalo villages some households catch and smoke beche-de-mer. Men catch them at night when the beche-de-mer move into shallow water. Dried beche-de-mer is sold in Honiara, the price varying by species and size. In 1994, one Langalanga man was exporting it to Australia.

Except for the daily collection of invertebrates by women, 60 of the 64 observed fishing trips were for angling, and 3 were for spearing. Hand-lining, pole-and-line, and deep-sea hand-lining were the methods used in angling. Women and two men often practise pole-and-line fishing in the lagoon, but the other men used only hand-lines (Table 1)

Fishing is usually done from a canoe. Abalolo villagers had 16 canoes and boats in use. Most canoes used for daily fishing were of the combined (2) and dugout (14) types. One household owned a motor-boat which was used for transportation. Two others owned motorised canoes, and one canoe was used for fishing and transport.

Table 1: Variation in fishing methods

	Deep-sea angling	Spearing	Angling	Pole- angling	Diving	Collecting	No. of individuals
Males	3 (3) ¹	3 (2)	10 (8)	(2)	1 (1)	0	13
Married females	0	0	12 (8)	(5)	13 (8)	15 (8)	16
Single females	0	0	6 (0)	(4)	8 (2)	9 (5)	10

¹ Numbers not in parentheses based on interviews, numbers in parentheses from actual observation.

The villagers identified a variety of fishing grounds, although some are no longer used (Fig.1). In particular, stone weirs and turtle-hunting grounds near the outer islands have mostly been abandoned. Daily fishing activities are largely focused within a 5 km catchment, approximately a two-hour round trip paddling a canoe.

Most fishing grounds currently used are located in the southern half of Arabara Harbour, because small islands, including artificial islands like Ta'alulolo and Gwaefou, are mostly located there. The shallow reef flats around the island are the most productive grounds for catching finfish and shellfish. Angling grounds for *mela* and *kulafu* are also concentrated in this area, probably because of the distribution of reefs and channels.

The villagers' use of fishing zones is shown in Table 2. It demonstrates that angling grounds in the lagoon are by far the most important fishing areas for the Langalanga. Most fishing is done by single individuals (Table 3). Occasionally, two persons, usually husband and wife, do angling together. I once saw a group of three men doing deep-sea angling, and the largest group I observed consisted of four men for turtle spearing at night.

Women frequently collect shellfish by walking on the beach or diving in front of the village and on reefs around the outer islands. Since such collecting activities are done during gardening or collecting of other coastal resources, I could not ascribe an exact frequency to them. But married women collect much more frequently than do single

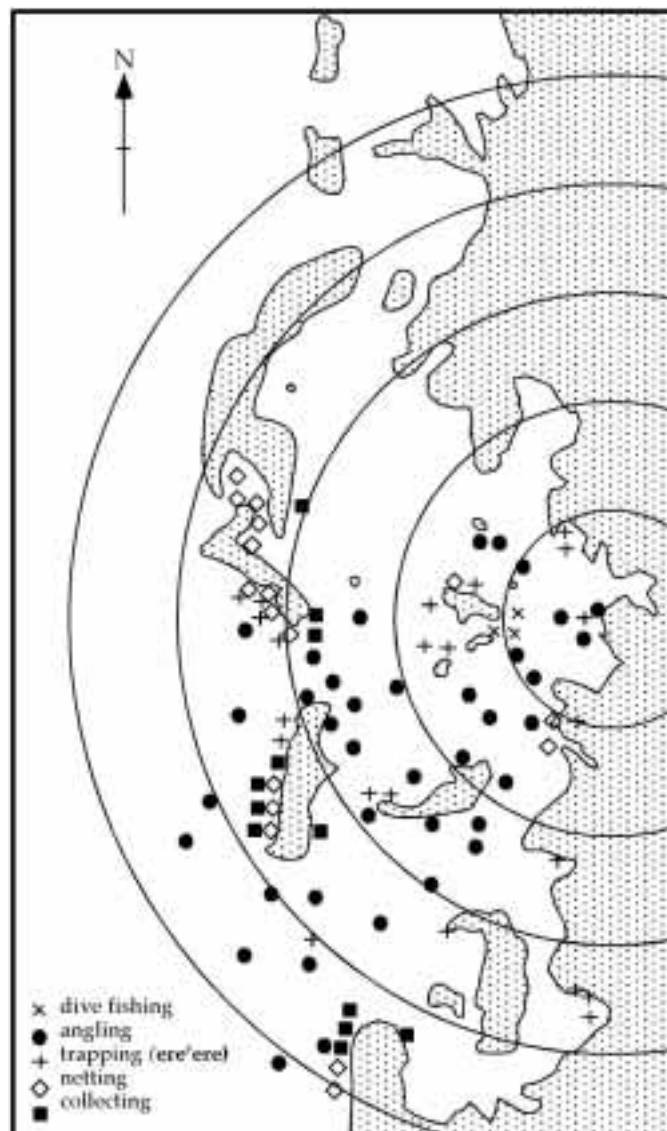


Figure 1: Fishing grounds close to Malaita Island

Table 2: Fishing trips by fishing grounds

Fishing ground	Number of trips	Males	Females
Near reef	9	5	4
Mangrove	1	1	0
Lagoon	43	40	3
Outer reef	8	7	1
Offshore	4	4	0
Total	65	57	8

Table 3: Fishing trips by number of people

No. of people	No. of trips	Males	Females	Males & females
1	56	49	7	–
2	5	2	1	2
3	3	2	1	0
4	1	1	0	0
Total	65	54	9	2

women. In particular, diving for shellfish is done by married women, although all the single women said that they could dive. Women often collected shellfish, crab and other invertebrates (e.g. **takwai**) when they went line-fishing.

The shellfish collected most often were **nau** (conch shell, Strombidae), **abuli** (giant clam, *Tridacna* spp.), **abuli** (cowrie, *Cypraea* spp.), and **wera** (cone shell, *Conus* spp.). Commonly caught crabs are **ma'abua** (*Oziu guttatus*), **kuka-li-madama** (*Carpilus* spp.) and **upara** (*Geothelphusa dehaani*). In contrast, men usually fish inside or outside the lagoon, but they often return without a catch.

Among the 60 angling trips observed, 19 were unsuccessful. In other words, nearly 30 per cent of fishing trips produced no catch. The average time spent for successful and unsuccessful trips was 4.39 hours (s.d.=2.55; n=35) and 2.56 hours (s.d.=2.04; n=21), respectively. The latter figure indicates that villagers may give up fishing after 2.5 hours.

The frequency of successful and unsuccessful trips in four weeks is indicated in Table 4. It is noteworthy that the ratio of successful to unsuccessful trips changed between the second and third weeks. The second week corresponded to a new moon period.

Table 4: Successful and unsuccessful fishing trips

Week	Successful	Unsuccessful	Total
1st	5	1	6
2nd	6	8	14
3rd	17	2	19
4th	13	10	23
Total	41	21	62

Fishing efficiency also changed by week (Table 5). The efficiency of successful trips did not change considerably, but if both successful and unsuccessful trips are combined, the actual efficiency fluctuated by the week. The energy expenditure for angling was about 156 kcal/hour (Kuchikura, 1988), and the yield of the successful fishing trips in Abalolo ranged mostly between 0.2 and 0.6 kg (Fig. 2). The energy efficiency of fishing is then estimated to range between 1.06 and 3.18 units. In the first week, most fishermen attempted to catch **uala** with unbaited hooks, and then to catch **kulafu** and other bottom-fish with **uala**-baited hooks. In the second week, it became difficult to catch **uala**, and therefore other fish as well.

Usually, fishers spent 2–3 hours searching for bait. If they were unsuccessful they would give up fishing for that day.

In the third week, before the full moon (**fuli afola**), **mela** entered the lagoon. This was when fishing trips were observed most frequently. I noticed that the men who did not go fishing in the other periods went fishing during this week. Fishers said that the best time to catch **mela** with unbaited hooks was either after rain or when it was cloudy, because **mela** could not see the hooks. In the third and fourth weeks it rained almost every afternoon, creating good conditions for **mela** fishing.

Table 5: Fishing efficiency

Only successful trips

Week	Time (hrs)	Man-hours	Catch (kg)	kg/hr	kg/mh	No. of trips
1st	8.8	8.8	2.4	0.28	0.28	4
2nd	9.0	12.0	4.4	0.49	0.36	4
3rd	78.4	81.9	37.1	0.47	0.45	14
4th	37.0	46.5	9.7	0.26	0.21	9

Including unsuccessful trips

Week	Time (hrs)	Man-hours	Catch (kg)	kg/hr	kg/mh	No. of trips
1st	9.8	9.8	2.4	0.25	0.25	5
2nd	28.3	33.3	4.4	0.16	0.13	12
3rd	81.4	84.9	37.1	0.46	0.44	16
4th	67.5	80.5	9.7	0.14	0.12	20

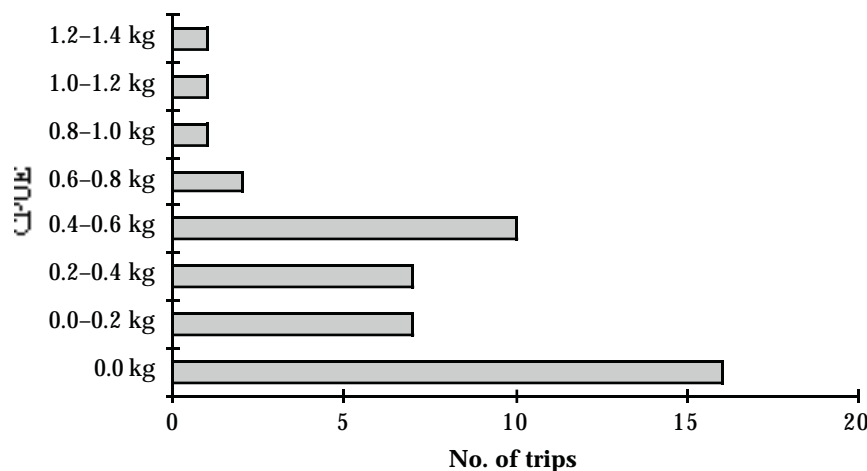


Figure 2: Number of trips in relation to the catch per unit of effort (CPUE) (kg/man/hour)

Around the full moon, from the end of the third week to the fourth week, one fisher started to catch **buli** (squirrelfish, *Holocentridae* spp.) during bright nights. **Buli** is a nocturnal carnivore and can be caught without bait. During the same bright nights other fishers caught **baraulo** and other fish in the lagoon channel using hooks baited with **uala**.

There is individual variation in the choice of fishing strategies. The angling strategies of six men are shown in Table 6. Three men (Nos. 1–3) seldom went fishing because they are the principal cultivator in their households. One man (No. 1) practised hand-lining only in front of the village and never went into the lagoon, No. 2 went fishing for **mela** only in the third week, and No. 3 did both pole-fishing and collecting shellfish and other invertebrates on each fishing trip.

The three men (Nos. 4–6) who were the most frequent fishers in the village all preferred hand-lining to pole-fishing. They also went deep-sea fishing outside the lagoon when weather conditions were favourable. They never collected marine invertebrates during the fishing trips. No. 5 did not own a

canoe and always borrowed one, either from his brother or an unrelated person. No. 6 did not own deep-sea fishing gear but usually borrowed it from his wife's brother who was away in Honiara. Thus there seems to be no rigid relationship between gear ownership and the frequency or intensity of fishing.

The choice of fishing strategies depends on several other factors, such as presence of other cultivators in the family, other methods for obtaining cash and personal preference.

References

- KUCHIKURA, Y. (1988). Food use and nutrition in a hunting and gathering community in transition, Peninsular Malaysia. *Man and Culture in Oceania* 4: 1–30.
- LAUMANI, M. (1989). Statistical Survey Report from Lilisiana, Ambu, Kanata, Waima'aka Forau and Foueda in Malaita Province. Auki, Fisheries Division, Ministry of Natural Resources, Malaita Provincial Government (unpub. ms).

Table 6: Individual variation in angling by male fishers

Fisher	Age	Total days	Fishing trips ¹	Trip frequency	Hours spent	Hours/trip	Total catch (kg)	Catch/hour (kg)	Fishing grounds ²			
									N	L	R	O
No. 1	60	25	3 (1)	8.3	3.00	1.00	1.34	0.44	3			
No. 2	60	25	2 (2)	12.5	9.50	4.75	3.25	0.34	2			
No. 3	50	25	6 (6)	4.1	19.75	3.29	5.52	0.28	4	2		
No. 4	40	13	9 (4)	1.4	25.25	2.80	4.82	0.19	9			
No. 5	30	20	8 (5)	2.5	38.20	4.78	18.05	0.47	7	1		
No. 6	20	19	10 (8)	1.9	56.95	7.11	10.53	0.23	8	2		

¹ Fishing trips: total trips (successful trips).

² Fishing grounds: N (near reef); L (lagoon); R (outer reefs); and O (offshore).

APPENDIX 1: Langalanga fish names

Langalanga name	Species/genus	Family	Langalanga name	Species/genus	Family
afana	<i>Cheilinus trilobatus</i>	Labridae	gome	<i>Mugil cephalus</i>	Mugilidae
akono	<i>Lutjanus rivulatus</i>	Lutjanidae	gorigori amadi	<i>Selaroides leptolepis</i>	Carangidae
ala'alauou	<i>Monotaxis</i> spp.	Lethrinidae	gorosisi	<i>Lethrinus erythracanthus</i>	Lethrinidae
aloa	<i>Cetscarus bicolor</i>	Scaridae	gulafu mumu	<i>Aethaloperca rogaa</i>	Serranidae
alubala	<i>Oplegnathus</i> spp.	Oplegnathidae	guma kwae	<i>Lutjanus russellii</i>	Lutjanidae
alubala	<i>Siganus guttatus</i>	Siganidae	gumarano	<i>Lutjanus monostigma</i>	Lutjanidae
amera	<i>Scarus quoyi</i>	Scaridae	gwae rafalo		Plesiopidae
arara	<i>Sargocentron</i> spp.	Holocentridae	gwae-rarate	<i>Euleptorhamphus viridis</i>	Hemiramphidae
arau melau	<i>Elagatis bipinnulatus</i>	Carangidae	gwagwara	<i>Thunnus</i> spp.	Scombridae
asia	<i>Lethrinus</i> spp.	Lethrinidae	gwagwari	<i>Nemipterus</i> spp.	Nemipteridae
asiasi		Mullidae	gwaille	<i>Scarus</i> spp.	Scaridae
asiasi-ole	<i>Lethrinus harak</i>	Lethrinidae	gwaili		Embiotocidae
ba'a	<i>Acanthurus thompsoni</i>	Acanthuridae	gwalugwalu	<i>Scarus schlegeli</i>	Scaridae
baekwa		Heterodontidae	gwara fetu	<i>Tylosurus crocodilus</i>	Belontiidae
baekwa		Scyliorhinidae	gwoufolo	<i>Scarus dimidiatus</i>	Scaridae
baekwa qwaulo		Sphyrnidae	gwougwou asi	<i>Scolopsis cancellatus</i>	Nemipteridae
baiko gwaulo	<i>Rhina ancylostoma</i>	Rhinobatidae	gwougwouru	<i>Hexagrammos otakii</i>	Hexagrammidae
bairo	<i>Hemiramphus far</i>	Hemiramphidae	gwougwouru	<i>Lophiomus setigerus</i>	Lophiidae
balifila	<i>Scarus sordidus</i>	Scaridae	ia a'alae	<i>Nematalosa japonica</i>	Drosomatidae
balubalu		Balistidae	ia bala	<i>Paracaesio kusakarii</i>	Lutjanidae
barabara	<i>Pseudocheilinus hexataenia</i>	Labridae	ia bala		Sparidae
baraulo	<i>Sphyaena</i> spp.	Sphyaenidae	ia bola	<i>Hemigymmus melapterus</i>	Labridae
baumeo	<i>Siganus vulpinus</i>	Siganidae	ia fili	<i>Scarus</i> spp.	Scaridae
beau		Blenniidae	ia foula	<i>Ostraciontidae</i> spp.	Ostraciontidae
bebe		Chaetodontidae	ia gwaua	<i>Sphyaena</i> spp.	Sphyaenidae
bebe	<i>Evistias acutirostris</i>	Pentacerotidae	ia kui		Branchiostegidae
belafa	<i>Acanthurus lineatus</i>	Acanthuridae	ia mela	<i>Lutjanus argentimaculatus</i>	Lutjanidae
bobola	<i>Lethrinus nebulosus</i>	Lethrinidae	ia rao	<i>Aulostomus chinensis</i>	Aulostomidae
boe		Tetraodontidae	ia toto	<i>Pteroinae</i> spp.	Scorpaenidae
bolali gwau	<i>Mugil cephalus</i>	Mugilidae	ia toto		Siganidae
bolo	<i>Acanthurus</i> spp.	Acanthuridae	ia li buruburu	<i>Lutjanus sebae</i>	Lutjanidae
botabota	<i>Thalassoma</i> spp.	Labridae	ia li buruburu	<i>Macolor niger</i>	Lutjanidae
bubu	<i>Sufflamen fraenatus</i>	Balistidae	ia li fou		Antennariidae
bubu taba	<i>Rhinecanthus aculeatus</i>	Balistidae	iladi	<i>Pterois</i> spp.	Scorpaenidae
bubusuli		Balistidae	imolo	<i>Herklotsichthys quadrimaculatus</i>	Dussumieridae
buli		Holocentridae	kakarai	<i>Naso thynnoides</i>	Acanthuridae
buli arara	<i>Sargocentron</i> spp.	Holocentridae	kakarau	<i>Parupeneus bifasciatus</i>	Mullidae
buli fou	<i>Sargocentron</i> spp.	Holocentridae	kakusae	<i>Terapon jarbua</i>	Terraponidae
buli kalame	<i>Myripristis berndti</i>	Holocentridae	kalikama	<i>Variola louti</i>	Serranidae
buma	<i>Trachurus japonicus</i>	Carangidae	kalita alu	<i>Balistoides conspicillum</i>	Balistidae
bumarau	<i>Scomber australasicus</i>	Scombridae	kaole	<i>Mugil cephalus</i>	Mugilidae
burasi	<i>Scarus sordidus</i>	Scaridae	karaona	<i>Lutjanus</i> spp.	Lutjanidae
daululu	<i>Gymnothorax</i> spp.	Muraenidae	karaona kwae	<i>Lutjanus russellii</i>	Lutjanidae
diadia	<i>Acanthocybium solandri</i>	Scombridae	kero	<i>Acanthurus triostegus</i>	Acanthuridae
didime	<i>Amphiprion</i> spp.	Pomacentridae	kokofe	<i>Amblyeleotris</i> spp.	Gobiidae
dolala	<i>Rastrelliger kanagurta</i>	Scombridae	kokofe	<i>Entomacrodus</i> spp.	Blenniidae
doru		Exocoetidae	kokoto		Haemulidae
dulimou		Apogonidae	komaro		Aulopopidae
edaeda	<i>Caranx melampygus</i>	Carangidae	kota		Hemiramphidae
fafawai	<i>Plectorhynchus gaterinoides</i>	Haemulidae	kowako	<i>Saurida elongata</i>	Synodontidae
fakata	<i>Acanthurus mata</i>	Acanthuridae	kulafu		Serranidae
fakuku	<i>Plectropomus laevis</i>	Serranidae	kulafu abularae	<i>Anyperodon leucogrammicus</i>	Serranidae
falata	<i>Siganus vermiculatus</i>	Siganidae	kulafu manare	<i>Ephinephelus malabaricus</i>	Serranidae
fali		Rhinobatidae	kulafu maranare	<i>Plectropomus leopardus</i>	Serranidae
fali malu	<i>Aetobatus narinari</i>	Myliobatididae	kuluburo	<i>Cephalopholis</i> spp.	Serranidae
fali malu	<i>Rhinoptera javanica</i>	Myliobatididae	kululu	<i>Myripristis</i> spp.	Holocentridae
farasifa		Haemulidae	kutu	<i>Amblyglyphidodon curacao</i>	Pomacentridae
fasura	<i>Lutjanus</i> spp.	Lutjanidae	kwakwa abu	<i>Lethrinus chrysostomus</i>	Lethrinidae
filafila mamala	<i>Zebrasoma</i> spp.	Acanthuridae	kwakwa terau		Centricidae
filafila mamala		Zeidae	kwalikwali	<i>Scolopsis bilineatus</i>	Nemipteridae
filalila mamala		Veliferidae	kwarakwara	<i>Scarus dimidiatus</i>	Scaridae
fisi		Pempheridae	kwari	<i>Caranx</i> spp.	Carangidae
folofolo	<i>Sphyaena</i> spp.	Sphyaenidae	kwasi gwomoli	<i>Caranx ignobilis</i>	Carangidae
fologalia	<i>Scarus rubroviolaceus</i>	Scaridae	kwasi rodo	<i>Pristigenys</i> spp.	Priacanthidae
foto	<i>Abudedefduf bengalensis</i>	Pomacentridae	kwatoa	<i>Lethrinus miniatus</i>	Lethrinidae
fou li fuo	<i>Siganus</i> spp.	Siganidae	lagui		Kyphosidae
gafalu	<i>Amblyeleotris</i> spp.	Gobiidae	lakifa	<i>Priacanthus</i> spp.	Priacanthidae
gafu	<i>Labrichthys unilineatus</i>	Labridae	lalakwaga	<i>Trachinotus</i> spp.	Carangidae
galani	<i>Neoniphon</i> spp.	Holocentridae	lasi	<i>Scomberoides</i> spp.	Scombridae
gale ido	<i>Ophichthus bonaparti</i>	Ophichthidae	lau	<i>Plectorhynchus goldmanni</i>	Pomadasyidae
gaso	<i>Sphyaena</i> spp.	Sphyaenidae	laugwa	<i>Platax</i> spp.	Ephippidae
gefu	<i>Centrophorus moluccensis</i>	Sphyaenidae	lifokau	<i>Liopropoma</i> spp.	Serranidae
gela	<i>Centropyge</i> spp.	Pomacanthidae	loba		Triglidae
gela		Pomacentridae	lofu		Scorpaenidae
gela ufi	<i>Chromis</i> spp.	Pomacentridae	lolodo	<i>Sphyaena japonica</i>	Sphyaenidae
geru	<i>Liza vaigiensis</i>	Mugilidae	lologia	<i>Ophisurus macrorhynchus</i>	Ophichthidae
giga	<i>Amblyeleotris</i> spp.	Gobiidae	ma'alia	<i>Epinephelus quoyanus</i>	Serranidae

Langalanga name	Species/genus	Family
maga		Ephippidae
maga		Monodactylidae
maito	<i>Acanthurus</i> spp.	Acanthuridae
mala nare	<i>Plectropomus areolatus</i>	Serranidae
malifara	<i>Carangoides bajad</i>	Carangidae
malifu	<i>Lutjanus</i> spp.	Lutjanidae
malifu au	<i>Lutjanus erythropterus</i>	Lutjanidae
malifu gwaimara	<i>Lutjanus sebae</i>	Lutjanidae
malifu li bara	<i>Lutjanus gibbus</i>	Lutjanidae
mama	<i>Ruvettus pretiosus</i>	Gempylidae
mamala tori		Trachichthyidae
mamalo	<i>Pentapodus</i> spp.	Nemipteridae
mamalo li boni	<i>Scolopsis ciliatus</i>	Nemipteridae
mamara kowa	<i>Scarus</i> spp.	Scaridae
mara	<i>Scarus ghobban</i>	Scaridae
marau	<i>Scomberomorus</i> spp.	Scombridae
matasi	<i>Parupeneus</i> spp.	Mullidae
maua	<i>Hipposcarus longiceps</i>	Scaridae
meamea		Paralichthyidae
meamea		Pleuronectidae
mela	<i>Caesio</i> spp.	Caesionidae
mela alite	<i>Caesio erythropterus</i>	Caesionidae
mela gwaile	<i>Caesio lunaris</i>	Caesionidae
mela rau	<i>Caesio pisang</i>	Caesionidae
melukuli	<i>Scarus niger</i>	Scaridae
mimidi eria	<i>Plectorhinchus chaetodontoides</i>	Pomadasyidae
moko	<i>Scarus</i> spp.	Scaridae
moro		Mugiloididae
muli alaga	<i>Siganus fuscescens</i>	Siganidae
muli lau	<i>Siganus argenteus</i>	Siganidae
munu	<i>Hapalogenys nigripinnis</i>	Pomadasyidae
musimusi	<i>Naso thynnoides</i>	Acanthuridae
nanasi		Syngnathidae
nora	<i>Strongylura incisa</i>	Belontiidae
o'oto	<i>Zenarchopterus dunckeri</i>	Hemiramphidae
oa	<i>Symphorus nematophorus</i>	Lutjanidae
odu	<i>Xiphias setifer</i>	Bleniidae
ofuna	<i>Upeneus</i> spp.	Mullidae
ofuofu	<i>Fistularia</i> spp.	Fistulariidae
ogabolo	<i>Caranx lugubris</i>	Carangidae
ogolu	<i>Grammatorcynus bilineatus</i>	Scombridae
oli	<i>Parupeneus cyclostomus</i>	Mullidae
oru		Pomacanthidae
osole	<i>Albula vulpes</i>	Albulidae
paopao	<i>Caranx</i> spp.	Carangidae
papawa	<i>Caranx</i> spp.	Carangidae
parakidili	<i>Cheilinus fasciatus</i>	Labridae
rakwa	<i>Polymixia japonica</i>	Polymixidae
rakwa geli	<i>Chanos chanos</i>	Chanidae
rakwa wale	<i>Elops hawaiiensis</i>	Elopidae
rala	<i>Siganus corallinus</i>	Siganidae
rarano	<i>Lutjanus</i> spp.	Lutjanidae
rau	<i>Katsuwonus pelamis</i>	Scombridae
rau gere	<i>Euthynnus affinis</i>	Scombridae
raurau	<i>Epibulus insidiator</i>	Labridae
rautofu		Carapodidae
rautofu	<i>Muraenesox cinereus</i>	Muraenesocidae
saitana	<i>Glyphisodontinae</i> spp.	Pomacentridae
saitana	<i>Grammistes sexlineatus</i>	Grammistidae
sasagore		Monacanthidae
siko	<i>Cheilinus diagrammus</i>	Labridae
sio	<i>Mulloidichthys flavolineatus</i>	Mullidae
soba	<i>Spratelloides gracillis</i>	Clupeidae
soke	(sharks) spp.	(sharks)
sopilo	<i>Gymnosarda unicolor</i>	Scombridae
suru	<i>Lethrinus</i> spp.	Lethrinidae
suru bobola	<i>Lethrinus lentjan</i>	Lethrinidae
susufi	<i>Lethrinus semicinctus</i>	Lethrinidae
susui tegue		Dasyatidae
susukelo	<i>Zanclus cornutus</i>	Zanclidae
tagafu	<i>Paracaesio</i> spp.	Lutjanidae
tagafu	<i>Pristipomoides sieboldii</i>	Lutjanidae
tagili	<i>Mola mola</i>	Mollidae
takolao	<i>Naso</i> spp.	Acanthuridae
takufe	<i>Xyrichtys</i> spp.	Labridae
tarasi		Gerridae
tautu		Diodontidae
tetebere	<i>Scatophagus argus</i>	Scatophagidae

Langalanga name	Species/genus	Family
tori alite	<i>Pinjalo microphthalmus</i>	Lutjanidae
tori gwalo	<i>Pristipomoides</i> spp.	Lutjanidae
tori karao	<i>Etelis & Tropidinius</i> spp.	Lutjanidae
tori oka	<i>Etelis coruscans</i>	Lutjanidae
uala	<i>Amblygaster</i> spp.	Clupeidae
uala sulii		Dussumieridae
uguai	<i>Caranx sexfasciatus</i>	Carangidae
uhu	<i>Cetoscarus bicolor</i>	Scaridae
ulasi	<i>Kyphosus lembus</i>	Kyphosidae
ulu meo	<i>Lutjanus bohar</i>	Lutjanidae
ume	<i>Naso unicornis</i>	Acanthuridae
unada	<i>Leiognathus fasciatus</i>	Leiognathidae
usu ole		Gobiidae
usuusu	<i>Naso</i> spp.	Acanthuridae
wagalu	<i>Rachycentron canadum</i>	Rachycentridae
waigela	<i>Cirrhitilabrus temmineckii</i>	Labridae
wailau	<i>Melichthys vidua</i>	Balistidae
wairalo		Ophichthidae
wale ele		Syngnathidae
walele		Hippocampinae
walelo		Belontiidae
walelo bokofu	<i>Tylosurus crocodilus</i>	Belontiidae
walelo li dauna	<i>Strongylura anastomella</i>	Belontiidae
wawali lau	<i>Odonus niger</i>	Balistidae
wawari	<i>Coryphaena hippurus</i>	Coryphaenidae

APPENDIX 11: Langalanga shellfish names

Langalanga name	Species/genus	Family
abuli	<i>Tridacna crocea</i>	Tridacnidae
abuli ime	<i>Cypraea</i> spp.	Cypraeidae
abuli lamo	<i>Cypraea</i> spp.	Cypraeidae
abuli laola fou	<i>Cypraea</i> spp.	Cypraeidae
abuli tatakawade	<i>Cypraea</i> spp.	Cypraeidae
buli lalamua	<i>Ovula ovum</i>	Ovulidae
bunu	<i>Cassis cornuta</i>	Cassidae
fara kwasi	<i>Anadra antiquata</i>	Arcidae
fitau	<i>Siliquaria ponderosa</i>	Siliquariidae
fodafoda	<i>Gastriidium geographus</i>	Conidae
fufole	<i>Amphinerita polita antiquata</i>	Neritidae
gwou rana	<i>Angaria melanacantha</i>	Angariidae
gwougwou	<i>Vasum turbinellum</i>	Galeoideae
ilmae	<i>Ovinotis ovina</i>	Haliotiidae
ilo	<i>Saxostrea parasitica</i>	Ostreidae
ime	<i>Tridacna gigas</i>	Tridacnidae
kairita	<i>Vasum ceramicum</i>	Vasidae
kakandu	<i>Anadara granosa</i>	Arcidae
ke'e	<i>Begonia semiorbiculata</i>	Crassatellidae
ke'e li fou	<i>Barbatia decussata</i>	Arcidae
keboru	<i>Psammotaea togata</i>	Asaphidae
kokobito	<i>Cerithium nodulosum</i>	Cerithiidae
kokori	<i>Periglypta moniliferum</i>	Veneridae
kokori	<i>Scapharca globosa</i>	Arcidae
kome	<i>Conus</i> spp.	Conidae
ku'u	<i>Terebralia tenkatei</i>	Potamidae
kurila	<i>Atrina vexillum</i>	Pinnidae
kwakwa tebotu	<i>Arca ventricosa</i>	Arcidae
kwao	<i>Lopha cristagalli</i>	Ostreidae
kwarta fuli	<i>Amusium japonicum formosum</i>	Amusidae
lauvi	<i>Lunatica marmorata</i>	Turbinidae
mabala	<i>Spondylus ducalis</i>	Spondylidae
mauli	<i>Chama iostoma</i>	Chamidae
momona	<i>Euchelus atrata</i>	Trochidae
nau	<i>Millepes</i> spp.	Strombidae
raili	<i>Marmorostoma</i> spp.	Turbinidae
roa	<i>Pinctada margaritifera</i>	Pteriidae
roa gaula	<i>Pteria penguin</i>	Pteriidae
romu	<i>Chama divaricata</i>	Chamidae
romu	<i>Chama pacifica</i>	Chamidae
se'ere meto	<i>Chrysostoma paradoxum</i>	Trochidae
sifala	<i>Turbo petholatus</i>	Turbinidae
sisilaelamo	<i>Hippopus hippopus</i>	Tridacnidae
tatafi	<i>Nodilittorina</i> spp.	Littorinidae
walulu	<i>Andontia edentula</i>	Lucinidae
wawa elo	<i>Gibberulus gibberulus</i>	Strombidae
weda	<i>Retina undata</i>	Neritidae

Notes on grouper spawning aggregations in Tongareva, Cook Islands, June 1995

by Kelvin Passfield

Tongareva (also known as Penryhn) is situated at approximately 9°S and 158°W. Fishermen there target an annual spawning aggregation of *Epinephelus polyphkadion*, known locally as **hapuku**.

In 1995 the **hapuku** started their spawning aggregation in early June. It is possible that they were gathering in late May, but significant catches were being made on the weekend of 3 June. For 2–3 weeks leading up to the time of the main spawning aggregation, higher-than-normal numbers of **hapuku** are caught around coral heads inside the lagoon. The main aggregation appears to last for only about 2 weeks. A similar annual event further to the west, in Manihiki Atoll (10°S and 160°W), is reported to last from new moon to full moon, around the same time.

Fishing is usually conducted just inside the main passage, in depths of around 20 to 35 m. Boats anchor in shallower water, around a patch reef, and drift back on long anchor ropes so that they are over deep water.

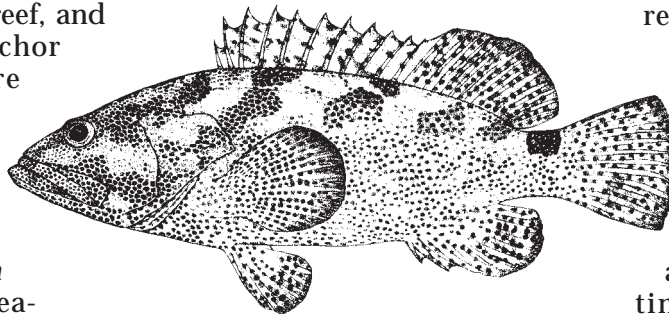
The preferred bait is fish, with several informants regarding **kaha** (mullet, *Liza vaigiensis*) as best. A reasonable weight is required to sink the hook fast, as sharks can and do take the bait. Four-inch-long pieces of reinforcing rod or big bolts are commonly used. Sharks are a significant problem, often biting through the line, resulting in gear loss. Spare hooks, weights and traces must be carried. Steel traces are sometimes used to prevent losing gear, with no apparent reduction in **hapuku** catch.

About 15 aluminum skiffs regularly fish Taruia Passage, and catch rates are usually in the vicinity of 10 to 12 fish per man hour, though they can be much higher in perfect

conditions. Fish average around 1.5 kg, and generally range from 1 to 2 kg. Fishermen return home with the approach of darkness, as the **hapuku** appear to stop biting at night-fall.

Either the aggregation is mainly females, or the males are not taking the baits. Of a sample of 33 fish, 31 were females, and only 2 were males. Other *Epinephelus* species, notably *Cephalopholis argus* (**roi**), also join the aggregation, but in much smaller numbers. Locals who have observed the fish say that they are all lined up on the bottom, pointing out through the passage.

Apparently **hapuku** aggregation also occurs at Tetautua, the other major passage in Tongareva lagoon. However, locals maintain that fish, especially **hapuku**, caught in this passage are poisonous (ciguatera), so they do not fish there.



A similar event is also reported to occur in passages on at least three of the atolls in Tuvalu further to the east (9°S, 179°E), and at about the same time. Nukufetau,

Funafuti, and Nukulaelae all report spawning aggregations of **gatala**, most likely *Epinephelus polyphkadion*. Other *Epinephelus* species are also present. Informants indicate that these fish have also been observed to be lined up facing the same direction.

In all the above cases, the fishermen are in general only fishing for local consumption, with some minor exports to national urban centres. Anecdotal information does not reveal any perceived significant reduction in stocks caused by these fisheries to date.

New publications

Traditional marine resource management and knowledge



A case study of traditional marine management systems in Pukapuka Atoll, Cook Island

MUNRO, DOROTHY M. (1996). A case study of traditional marine management systems in Pukapuka Atoll, Cook Islands. Field Report 96/2, Project RAS/92/TO5. Forum Fisheries Agency and FAO. Rome, FAO. 68 p. (no price given).

This report addresses the customary and formal legal framework for decision-making regarding fishing. Management measures, enforcement, conservation and an evaluation of impacts on resource use and management measures are discussed. Useful descriptions of fisheries, fishing methods and gear types, local marine knowledge, and the relationship between fisheries and belief systems are provided. Background material is provided on the social structure, political organisation, diet, economy, and division of labour, among other topics.

Man and crabs in Yaeyama folk song: Crab-species identification and folkzoological background

Takeda, Jun & SATOKI OHYAMA. (1994). Man and crabs in Yaeyama folk song: Crab-species identification and folkzoological background. *Humans and Nature* 4: 99–124.

The Yaeyama Islands of Okinawa Prefecture, Japan, are a treasury of ancient folklore, poetry and song that has long attracted the attention of scholars. The islands are particularly rich in folk songs that deal humorously or ironically with the small animals that live in close proximity with humans. There is a huge repertoire of folk songs dealing with crabs, among which the AMPARUNUMIDAGAAMA YUNTA song is the most popular. This song talks about the fifteen species of crabs that inhabit the Amparu mangrove near the Ishigaki City. It describes their morphological appearance and behavioural characteristics. The authors of this paper attempt to identify the species mentioned by studying the folkzoological context of the song around the Amparu mangrove.

(First author's address: Division of Ecology, Museum of Nature and Human Activities, Yayoigaoka 6, Sanda-shi, Hyogo-ken 669-13, Japan.)

Indigenous resource management and sustainable development: Case studies from Papua New Guinea and Indonesia.

AKIMICHI, TOMOYA. (1995). Indigenous resource management and sustainable development: Case studies from Papua New Guinea and Indonesia. *Anthropological Science* 103(4): 321–327.

Two cases, one from Manus, Papua New Guinea, and the other from Maluku, Eastern Indonesia, are examined to evaluate the roles of customary regulations for resources management under rapidly changing social and economic conditions. In the Manus case the resolution by either informal compromise or local courts of inter-clan disputes over reef ownership is examined to illustrate the important role of local government in modern resources management and social integration.

(Author's address: National Museum of Ethnology, Senri Expo Park, Suita, Osaka 565, Japan.)

Sea tenure and its transformation in the Lau of North Malaita, Solomon Island.

AKIMICHI, TOMOYA. (1991). Sea tenure and its transformation in the Lau of North Malaita, Solomon Island. *South Pacific Study* 12(1): 7–22.

This article examines the sea tenure system of the Lau, a fishing people who dwell on artificial islands off the north-east coast of Malaita Island. There the sea is divided into areas 'owned' by and inherited through patrilineal descent groups, and areas that are open access. The authors discuss the social and cultural functions of the Lau sea territories, and the regulations applied to them. The recent introduction of commercial fishing for beche-de-mer, reef fish and demersal fish is examined in terms of resource over-exploitation, social conflict and the transformation of Lau sea tenure practices.

(Author's address: National Museum of Ethnology, Senri Expo Park, Suita, Osaka 565, Japan.)

Coastal foragers in transition.

AKIMICHI, TOMOYA (ed.). (1996). Coastal foragers in transition. *Senri ethnological studies* No. 42. National Museum of Ethnology, Osaka. 227 p. (no price given).

This latest volume in the Senri Ethnological Series contains 10 papers by Japanese social scientists, in one case in collaboration with Indonesian researchers. Five of the contributions deal with Melanesia, and the remainder with South-East Asia.

The papers on Melanesia are: 'Lagoon life among the Langalanga, Malaita Island, Solomon Islands', by Akira Goto; two contributions by Daisuke Takekawa on dolphin hunting in Solomon Islands: 'Ecological knowledge of Fanalei villages about dolphins' and 'The method of dolphin hunting and the distribution of teeth and meat'; a paper by Masataka Tawa entitled 'Reef tenure of Western Province of Papua New Guinea'; and Kazuhiro Suda's paper 'Time allocation and food consumption among the Kiwai-speaking Papuan in Papua New Guinea'. The five papers on South-East Asia deal with marine resource use, sea tenure and small-scale fisheries in Indonesia and Peninsular Malaysia.

(For purchase information please contact the Publications Office, National Museum of Ethnology, Senri Expo Park, Suita, Osaka 565, Japan.)

Charting coastal resource development in Papua New Guinea: Lessons from a participatory workshop.

READ, TORY & LAFCADIO Cortesi. (1995). Charting coastal resource development in Papua New Guinea: Lessons from a participatory workshop. Tory Read Associates, Boulder, Colorado, USA. 65 p. (no price given).

(To obtain a copy of this report and related documents contact: Greenpeace, 568 Howard Street, San Francisco, CA 94105, USA.)

Related to the above is the following: Read, Tory. (1994). Coastal resource issues in Papua New Guinea: A phototext collection. Tory Read Associates, Boulder, Colorado, USA. 65 p. (no price given). (To obtain a copy of this report and related documents contact: Greenpeace, 568 Howard Street, San Francisco, CA 94105, USA.)

Update of coral reef researchers directory

The *Directory of Coral Reef Researchers of the Pacific* is being updated to become world-wide in scope. The International Coral Reef Initiative (ICRI) and the South Pacific Regional Environment Programme (SPREP) are providing funds to support this effort.

All researchers previously contacted will receive a copy of the current entry for verification and e-mail address addition. Others will receive original questionnaires. It is planned to have this directory on Internet.

For further information contact: L.G. Eldredge, Pacific Science Association, P.O. Box 17801, Honolulu, Hawaii 96817, USA. Tel: 1-808-848-4139; fax: 1-808-847-8252; Internet: psa@bishop.hawaii.org

Miscellaneous

Traditional marine resource management and knowledge



Useful information in electronic media

(1) Databases on CD-ROM

A very large number of library materials, especially abstracts of the scientific literature, are available on CD-ROM. Two good places to start finding out exactly what is available in North America are Silverplatter Information Inc., 100 River Ridge Drive, Norwood, MA 02062-5043, USA (fax: 1-617-769-8763), and National Information Services Corporation, Wyman Towers, 3100 St. Paul Street, Baltimore, MD 21218, USA (fax: 1-410-243-0982). Ask for their catalogues. Their offerings include: Aquatic **sciences and fisheries abstracts**; **Water resources abstracts**; Oceanographic and marine resources; and Fish and fisheries **worldwide**.

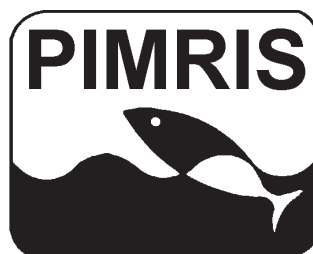
(2) Discussion groups

FISHFOLK: This is a fisheries social science network. Subscribe and then send your mail to: listserv@mitvma.mit.edu

ICAM-L: Is an integrated coast area management discussion group of the FAO. First subscribe to listserv@irmfao01.bitnet, and then send your mail to icam-l@irmfao01.bitnet (by way of clarification, please note that in the second address above, icam- is followed by a lower-case L, and not by a number 1).

AQUA-L: This is an aquaculture discussion list. First, subscribe to listserv@upei.ca, and then send your mail to aqua-l@upei.ca (again, please note that in the second address aqua- is followed by a lower-case L, and not by a number 1).

PIMRIS is a joint project of five international organisations concerned with fisheries and marine resource development in the Pacific Islands region. The project is executed by the Secretariat of the Pacific Community (SPC), the South Pacific Forum Fisheries Agency (FFA), the University of the South Pacific (USP), the South Pacific Applied Geoscience Commission (SOPAC), and the South Pacific Regional Environment Programme (SPREP). This bulletin is produced by SPC as part of its commitment to PIMRIS. The aim of PIMRIS



Pacific Islands Marine Resources
Information System

is to improve the availability of information on marine resources to users in the region, so as to support their rational development and management. PIMRIS activities include: the active collection, cataloguing and archiving of technical documents, especially ephemera ('grey literature'); evaluation, repackaging and dissemination of information; provision of literature searches, question-and-answer services and bibliographic support; and assistance with the development of in-country reference collections and databases on marine resources.