Sea Tenure and Its Transformation in the Lau of North Malaita, Solomon Island

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Abstract

The sea tenure system of the Lau was investigated. The Lau are a fishing people who dwell on artificial islands off the northeast coast of Malaita Island of the Solomon Islands. In terms of Lau sea tenure and ownership of fishing grounds was our focus. The sea is divided into owned and free areas; the former are inherited by patrilineal descent groups, and have higher resource potentials than the latter. The function of the Lau marine reserve serves social and cultural goals, as well as maintains an ecologically sustainable use of the marine resources. The owned areas are usually closed, and lifting of the restriction is declared for only a few days or so *per annum*. It is however extended to months in such cases as funeral rites. This strict regulation not only ensures a large catch, but also implements economic and social exchange between the Lau, the fish provider, and the agriculturalists of Malaita, the supplier of starchy food and shell money. The recent introduction of the commercial fishing of sea cucumber, reef fish, and demersal fish in offshore waters may give rise to overexploitation of resources, social conflict and transformation of the Lau sea tenure practices.

Key Words: Sea tenure, Exchange, Fisheries, Development, Sustainability.

Introduction

During the last two decades maritime property rights and its credibility to resource management has been a central issue in the studies of maritime anthropology (ACHESON, 1975; CHRISTY, 1982; MCCAY and ACHESON, 1987). By property rights four categories are proposed as effective for the argument, *e.g.*, open access, private property, communal property, and state property (FEENY *et al.*, 1990).

While property rights connote "to own" as well as "to access" and "to use" (BAINES, 1985), claims of ownership are applied not only to fishing grounds but also to fishing techniques, equipment employed and even fish species taken (CARRIER, 1980). These rights also tend to change in response to technological and socio-economic changes (RUDDLE and AKIMICHI, 1984; RUDDLE and JOHANESS, 1985).

Given such ambiguities of the concept of and liability to change, it is important to focus upon how property rights in a given society are molded as a complex whole, and to examine how such property rights are identified and used under particular socio-economic conditions.

In line with these views, this paper deals with the ownership of the sea and its transforma-

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tion in the case of the Lau, an artisanal fishing people of Malaita in the Solomon Islands. Our first goal was to examine the system of sea ownership of the Lau. Second, the social and ecological basis of ownership is presented, and third, how socio-economic changes will affect the Lau sea tenure is discussed.

The fieldwork was conducted in 1990 on Funa'afou Island as a part of a study entitled, "Cultural Adaptation and Strategies on the Use and Management of Coastal Marine Resources in Tropical Asia and the Southwestern Pacific", funded by a grant from the Japanese Ministry of Education, Culture and Science. Data of the present study is also derived from my fieldwork held in 1974–75 on the same island (AKIMICHI, 1978).

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Lau Economy and Marketing

The Lau lagoon extends along the north-east coast of Malaita Island, and is situated in the central part of the Solomon Island chain (Fig. 1). In this lagoon, Lau-speaking people live on artificial islands, built by piling up a mass of coral rocks. Some fifty man-made or semi-artificial islands are scattered extensively in the lagoon, and these tiny islands provide

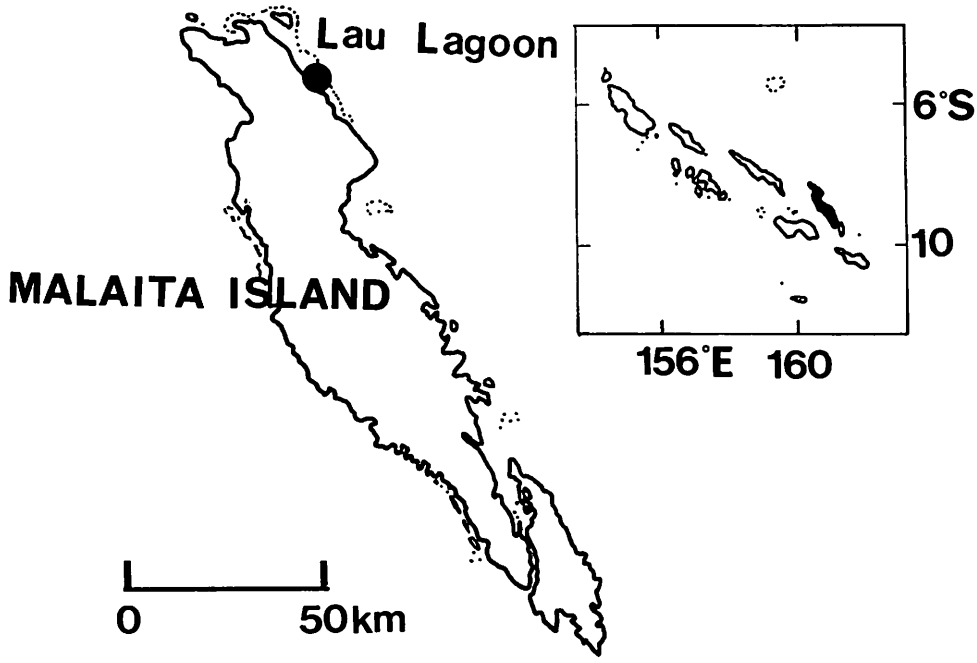

Fig. 1. Location of Lau lagoon and Malaita Island.

minimal space for islanders' daily life (IVENS, 1930). The extensive lagoon, protected by barrier reefs, stretches over thirty kilometers along a north-west to south-east axis and supports a rich variety of coastal marine resources. These resources provide the economic basis of the Lau.

Indeed, the Lau people have depended almost exclusively on marine resources to sustain their life. The Lau are well-known fishing people of Malaita as are the Langa-Langa people of the west central coast, and both of them are designated as saltwater people (*wane i asi*), distinguished from hill people (*wane i tolo*) who inhabit the interior and hillsides of the main island of Malaita and depend on agriculture as a subsistence base. Particularly, the Baegu (Ross, 1973) and the Baelelea groups have intimate relations with the Lau.

Lau subsistence is composed of three elements; fishing, agriculture and marketing. As I have described elsewhere, the Lau retain over one hundred kinds of fishing techniques, using different types of nets, kite, hook and line, fish poison, spears and so forth (AKIMICHI, 1978).

Although on a small scale, the Lau have gardens in the swampy areas of Malaita and they cultivate swamp taro (*kakama*: *Cyrtosperma chamissonis*), sweet potato (*kairoki*: *Ipomoea batatas*) and yam (*kai*: *Dioscorea alata* and *fana*: *D. esculenta*) (cf. YEN, 1974). Floating mangrove seeds are often collected and serve as food after the tannic acid has been

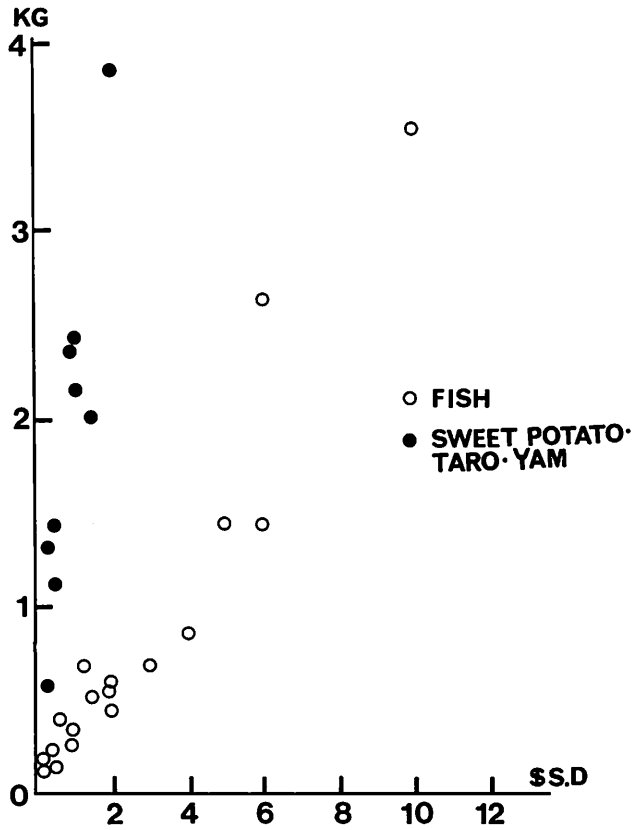

Fig. 2. Relations between price and weight of food items sold at markets, North Malaita (Aug., 1990).

eliminated. A shortage of land for cultivation has forced the people to depend on the agriculturalists for vegetable food. The Lau obtain starchy food from these agricultural partners at local markets (*usia*).

At the time of my research in 1990, there were five markets in north Malaita as follows: Takwa, Takwea, and Sulione (between the Lau and the Baelelea) to the north, Urutao and Maanabeu (between the Lau and the Baegu) to the south. These places are located at either river sides a few kilometers upstream from the coast, or along the coast. Markets appear to be located at territorial boundaries between *wane i asi* and *wane i tolo*.

To market, the Lau bring fish, raw and cooked, and other marine food such as turtle meat, shellfish, and mangrove crabs whereas the agriculturalists provide taro (*alo*: *Colocasia esculenta*), yam, banana and other vegetable crops in return.

Markets are usually open around ten o'clock in the morning for an hour, but Maanabeu market was held only in the evening. Only women can take part in the dealings. Men remain outside of the market place and enjoy chattering and betel-chewing. This was, in former times, to avoid tribal fighting. Nowadays, cash is prevalent for the sale, but barter is still seen between women's companions and on mutual negotiations. Standard exchange rates for items of sale are recognized but bargaining, complaining, and overcharging are also common. Fig. 2 shows some examples of the relation between price and weight of food items, measured at the markets of Sulione and Takwea during the research. Note the relative high price of fish compared with those of vegetable foods at the same weight level (Fig. 2).

Fishing and Ownership of the Sea

Fish and other marine resources are primarily important for the Lau as a source of daily food as well as items for food exchanged at the markets. Thus, fishing (*deela*) and gathering (*takomai*) have become the most developed subsistence activities. As we see below, a heavy dependence on marine resources is crystallized in the complex and ingenious use of fishing grounds.

In terms of land ownership, the agricultural people of the mainland have developed a land tenure system, characterized by an aggregation of land-holding units which are retained and inherited by patrilineal descent groups (ROSS, 1973; MOORE, 1985).

Unlike the agricultural people who depend on horticulture for their living, the saltwater people do not have enough land to supply staples. Land tenure is not, therefore, an important part for their social life, and emphasis is directed to the sea, rather than to the land.

As I have already described elsewhere, the Lau classify the sea (*asi*) into various named areas according to geographical and ecological features. First, the lagoon (*asi namo* or *asi hara*) is most intensively exploited, and it is further divided into several zones according to depth and bottom features (AKIMICHI, 1978). Depth in the lagoon is distinguished as either a deep abyss (*mae matakwa*) or a shallow pond (*lobo*). The lagoon is fringed by a barrier

reef (*fafoile*) whereas mangrove swamps (*koa*) border the landward edge of the lagoon. *Koa* is crosscut by small rivers (*kafo*). The lagoon is cut across by a passage (*fakali*) which is deep enough for large vessels to pass and to anchor. Beyond the passage is the deep ocean (*asi matakwa*).

Of these geographical divisions, ownership for most parts of the lagoon, rivers, and mangrove swamps is generally claimed by patrilineal descent groups which are composed of several patrilineages. While the open sea, the passage, and some parts of the lagoon are for free-use. Practical domains of ownership is unwritten and customary. These have been maintained by the oral tradition of the people. For instance, the reason why some of the sea territories of the One-Ia descent group of Funa'afou Island were transferred to the Aenabaolo descent group is mentioned in the oral story as follows:

> One man Funua of the One-Ia, asked Dauwao of the Aenabaolo if he can use Dauwao's canoe for fishing. This man Funua used the canoe and fished at Foungaekwa. Funua tied a stone to the end of the net. When the stone fell, it broke the canoe of Dauwao. When Funua returned, Dauwao asked compensation for the damage of his canoe. Then, Funua yielded his territory (*alata*) from Gounakou to the end of Baro, and from Baro to the end of Dedefo, instead of paying by shell money.

Transfer of the usufructuary rights of the sea as compensation is called *faadiana,* and it was not uncommon. Originally, *faadiana* meant "to embellish" (Fox, 1974). How the sea rights are inherited is likely to indicate that reefs are owned collectively by descent groups just as the land is. As the oral tradition suggests, inherited primary or usufructuary rights are transferred to others as a secondary rights (BAINES, 1985). Also, inherited sea areas were given from the owner to the priest not as compensation but in respect of his religious status. For instance, the Borote sea area was given from Kii to the priest Gagame, although both belonged to the same descent group. The area given to the priest is thus called *asi nia wane ni foa.*

Who claims the ownership? To this question, it can be said that particular descent groups have the rights to claim, not individuals, although the head of the group has practical hegemony to control these hereditary sea rights. It is well-known in the Pacific that a village or an island community as a whole often becomes a sea-holding unit besides clans, descent groups, and lineages (SUDO, 1984). In case of the Lau, there is no such case.

Disputes over reefs and ownership of the sea are mostly caused by these factual relations who claimed first and whether or not it was transferred to particular members of descent group. Even now some of the reefs are under dispute between two clans. Disputes over reefs that have been commonly found in Oceania are related to "ownership" (CORDELL, 1988).

Transfer of the seas is therefore a key to understanding the sociological basis of Lau sea tenure. The history of every claimed portion of the sea is likely to be kept in the memory of the people. Despite primary rights of ownership of the lagoon being established as a whole, shallow waters in the lagoon of sea-grass beds (*asi afu* or *fafobusu*) are not demarcated and can freely be used for fishing and gathering. As the open sea and passages can also be used

free, we need a careful examination on the concepts of "free-use".

According to the Lau, the idea of free-use which is applied to both deep and shallow waters is termed *gula e mola*. The use of the open sea and shallows in the lagoon, however, is subtly differentiated in terms of property rights. The deep sea is subject to open access while the shallows to communal property rules, although the Lau do not distinguish between these two terminologically. Reef edges and fronts, boundary zones of deep waters leading to shallows, and slopes of abysses in the lagoon are all claimed as lineage property. The idea of owned sea areas is termed *gulagera wanegi* (owned by the people), which corresponds to, according to the FEENY's divisions, private property. The ecological basis of Lau sea tenure is mentioned under the following section.

Fish Ecology and Fishing Sites

The territorial dichotomy (*mola*: free/*wanegi*: personal) is primarily related to a practical mode of exploiting marine resources. Of some one hundred fishing techniques employed by the Lau, the fish-drive is most important, as it yields a great number of fish per haul. Indeed, of the total number fishing techniques over fourty percentage of them are varieties of fish-drives (cf. AKIMICHI, 1978). Fish-drives are conducted with a big net which is usually tied at both ends with ropes of coconut leaves and cane.

Selection of the spot where the net is set and hauled in during a fish-drive is crucial for a good catch. These spots are generally called *gouna alata* (head of the fishing ground) and are named and owned by members of particular clan or lineage. As I have already shown, distribution of *gouna alata* are localized. For instance, *gouna alata* recognized by most of the members of the Funa'afou island community, amounting to some 140 in number are located at reef edges of the passage, boundaries between deeps and shallows in the lagoon. Rivers are also designated as being owned.

Localization of *gouna alata* are claims of ownership given to these spots require some explanation. As the name of individual *gouna alata* suggests, *gouna alata* are sites where fish aggregate for sheltering, feeding and daily migration. River mouths also become passages for fish movement aroused by the ebb and retreat of the tide where mangrove branches are often used as artificial fish shelters. The absence of *gouna alata* around outer reef fronts suggests the inefficiency of fish-drives around surf break zones. However, claims to these reefs may be for either turtling or harvesting benthic resources such as *Tridacna* or *Tectus*.

Clearly, knowledge of the micro-environmental features of the sea is a vital element of the fishing activity (JOHANESS, 1978a, 1981; NIETSCHMANN, 1985; CORDELL, 1988). I have also presented similar findings as to selectivity of fishing spots from the study of Okinawan artisanal stake-net and lift net fisheries (AKIMICHI, 1984; 1985).

Making use of these owned sea areas, various types of fish-driving techniques are used. The number of participants ranges from ten to over one hundred. The catch of reef fish of many species, large and small, reaches two to three hundred in number per haul.

Table 1. Terminology of fishing spots of *Gouna Alata* by fish names, and other selected categories.

1.	Fish (in general)
	Fou Ia
2.	Specific Fish
	Aaragwala, Amera, Fa'au, Gwangosi (3), Isiofu, Kukuli, Maelafu, Magali, Matasi (5)
3.	Compound Words
	Gouna Kwasi, Fou Ulafu, Aba Nara, Fou Balu, Ere Eeda, Alata Ume, Maana Gweru, Loua Suru, Fairada, Gouna Moua, Tafira Ia, Lobo e Hahango, Taalu Akwango, Alata Malifuu, Alata Takwalao, Suru Baita, Suru Aike, Alata Babalu, Alata Bokofu
4.	Fishing Techniques
	Foua Uka, Ere Faga, Ere Lui, Soko i Matakwa
5.	Sea Algae
	A'ama, Maana A'ama (3), Abe Afu (3)
6.	Coral Rocks
	Fou Mui, Maana Fou, Feta Maega, Busui Lade, Urae Fou, Aba Fai Au, Lade, Maana Taalu, Foubuli, Maana Lade, Fou Bania, Aena Fou

Number in parenthesis shows the number of sites found more than twice.

Contrary to these zones of high resource potentials, the shallow sea-grass beds and sandy bottoms support less fish resources. In this area, various types of small-scale fishing is undertaken throughout the year; spearing, groping for shells and sea urchin, hooking of mantis shrimp, fish poisoning, and net fishing with scoop, hand, and small gill nets.

Two communal fishing techniques are applied in this area. One is conducted during a retreating tide (*lafi oko*), with the aid of a cane rope (*oko*) over three hundred meters long. Twenty or thirty spearfishermen take part and each diver spears as many as one hundred rabbitfish (*muu*: *Siganus* spp.). The other is *lau maelafu,* which is conducted with both a big net and a long coconut-leaf rope for sweeping fish from the deeper waters to the shallows. The major catch is *maelafu* (*Leptoscarus* spp.), *matasi* (*Parupeneus* and *Upeneus* spp.), and *muu* (*Siganus* spp.).

The open sea or *asi matakwa* is fished seasonally during a calm using bottom line rigs or fishing kites (for needlefish). During rougher times young fishermen often go offshore for trolling (for tuna and bonito) in out-board boats and bring back several bonito per expedition. They never go out of sight of the artificial islands. Thus, fishing in *asi matakwa* is less active and there appears to be no critical boundary nor customary rules to limit access to and beyond these areas.

From the above we can see that Lau ownership of the sea is composed of two aspects; sociological and ecological. The former is connected with inheritance and the tranfer of sea rights and it is comparable to the land ownership of their agricultural counterparts. The latter is, on the other hand, related to ecological factors of resource potentials in coralline environments. Geographical distribution of property rights, *i.e.*, *mola* (open access and communal property) and *guragera wanegi* (private property), verifies this. Typical examples of the sea demarcation are illustrated in Fig. 3. As is suggested from this, the focus of property rights lies on the lagoon tenure where these two aspects are intermingled (Fig. 3).

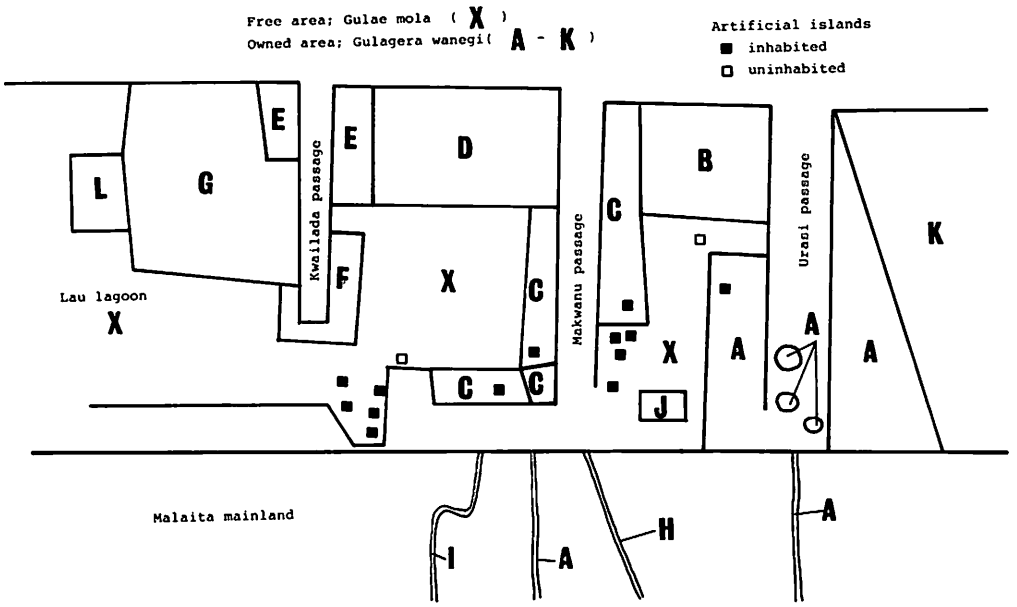

Fig. 3. A schematic map illustrating ownership of the sea.

Lagoon Tenure

As we have seen, the sea is generally perceived as the property of the Lau people. Further, the lagoon is divided into local sea territories which are in the possession of a particular clan or lineage. For instance, the sea areas the people of Funa'afou own and usually exploit are delimited to areas between Fakali Kwailada and Fakali Urasi (two passages of Kwailada and Urasi). Beyond these two passages, the lagoon is possessed by members of neighboring islands.

Within this local territory of Funa'afou, the sea is further subdivided into several fishing areas. These fishing areas are generally termed *asi*. Individual *asi* are named and owned by members of certain descent groups or patrilineages. For instance, between Makwanu and Urasi Passages, the lagoon is divided into owned areas such as Abanafolo, Baleo, and Tara'ana, and unowned areas. The abyss in the lagoon or *mae matakwa* is also owned as it provides a good fishing ground for fish-drives, *tae-matakwa*. How these sea areas are used is not arbitrary but dictated by ecological and social variables. Below, several instances of the use of the fishing areas are shown for the analysis of the lagoon tenure.

Socio-Economic Factors

As I have pointed out already, unowned sea areas are usually shallow sea-grass beds which do not have high resource potentials, and such fish as rabbitfish (*Siganus* spp.), emperor (*Lethrinus* spp.), and parrotfish (*Leptoscarus* sp.) are taken. According to the informant, these areas are said to have been reserved for communal use since initial settlements of the Lau. Those who had not owned seas or *wane langi ada asi* could thus retain the rights to

fish. While those who have sea rights owing their territorial waters, are called *wane ana alata.* This supports the idea that *mola* signifies not only "to be free" but also "communal". Owned seas are not always open for resource exploitation. Rather, sea areas or *asi* tend to be closed and thus fishing is usually forbidden (*asi abu*). Here, *abu* denotes "tabooed". *Abu* is opposed to *mola* in the Lau cosmology (MARANDA et MARANDA, 1970) and this notion is also found among the hill people (KEESING, 1982).

When and why individual sea areas open (*asi mola*) or close calls for particular attention. The opening the sea areas extends for either short or long periods of time according to the situation, and depending on the nature of the fishing grounds. When a closing is declared, wooden poles are always set up at the boundary of the owned area as an indicator. Such a practice is termed *otongai.* I have also reported elsewhere about similar practices to set marks as the taboo declaration for fishing; *e.g.*, young coconut fronds in the Satawal Island of the Central Carolines (AKIMICHI, 1986) and wild palm leaves in Vanuatu.

Following are six case studies on the opening and closing of fishing areas.

Case-1: During the dry season (*ara*), canarium almonds or *ngali* ripen in the forests of Malaita. The ripening of *ngali* is a good sign of time-reckoning on Simbo of the Solomon Islands (BURMAN, 1981). As *ngali* nuts are a favourite delicacy of the Lau, people are eager to obtain them from the agriculturalists who prepare *biingali,* cooked almonds packed in a bamboo tube. One *biingali* tube is equivalent to one big or two small fish. Fifty *biingali* tubes also correspond to one fathom of red shell money currency. In order to get *biingali,* closed fishing grounds are temporarily opened for three to eight days in order to get fish. This practice is called *lilifu* or *lifu a ia.*

Faanunu is a word to denote the opening of sea areas when a request comes from the Baelelea and/or the Baegu people, asking for a large amount of fish in exchange for shell-money. The reasons and purposes for the demand for fish are multiple and contextual, but it is generally for the purpose of feasting. Below, two examples are shown.

Case-2: Kafumani of Takwea (the Baelelea tribe) asked Kii to prepare fish equal to two bundles (fathoms) of red shell money (*ro tafuli'ae*) for the feast of ancestor worship (*maoma*). As a fathom of red shell money is the equivalent of 100 fish, this contract is for 200 fish. Upon a request from the Baelelea people, Kii organized a large-scale fish drive for two successive days. The harvested fish were cooked and then brought to the Takwea market and sold to Kafumani for two bundles of red shell money. This exchange practice is also called *lilifu* or *lifu a ia.*

Case-3: Talunga of the Langane area (the Baegu tribe) wished to have a ceremony, dedicating the opening of the Anglican Church. He needed four hundred fish for the party, and he asked Kii to prepare them. Kii agreed to this proposal and fished at the fishing grounds of Gwailuma and Tara'ana for two days. The techniques employed were a fish-drive *aarulaa*, using a big net (*Furai Malakwa*) at Gwailuma, and divers using torch-light at Tara'ana. The catch was composed of two hundred smaller reef fish, and twenty big *gwaila* (Double-Headed Parrotfish: *Bolbometopon muricatus*). It should be noted that one big *gwaila* is regarded as equal to ten small reef fish. Hence, twenty *gwaila* were equivalent to two hundred reef fish. In return, four bundles of red shell money were paid to Kii from

the Baegu people.

The first example of opening the sea areas appears to be a seasonal event in line with the ripening of canarium almonds and the fish are used as an item of barter trade, as the expression of *usia biingali* (market of roasted almonds) denotes. The exchange of almonds and fish occur, however, during the wet season (*koburu*).

The next two cases are contractual episodes between the Lau and its counterparts, rather than seasonal events. For the agriculturalists, fish are used for socio-economic goals whereas the Lau provide the fish ultimately as a means to accumulate shell money.

Shell money, made of strings of tiny beads of *Spondylus* shell discs, is an important currency for the whole people of Malaita (COOPER, 1971). It is a measure of social and political status, as well as used for bride-price. Shell money is also indispensable in various aspects of social and religious transactions such as funerals, rituals for ancestor worship, compensation for taboo violation and conflict resolution (Ross, 1973).

For accumulating shell money, the Lau use fish as a medium of social exchange. As fishing techniques and catch composition vary to considerable extent, the values of fish are also differentiated depending on the kind and size of fish. For instance, a large sawfish (*taifasoro*) corresponds to one bundle of red shell money consisting of ten strings (*kobi malefu*) in one fathom. One large or two small stingrays are also equivalent to one bundle of shell money. The following are examples of the number of fish equal to one fathom of red shell money; ten large barracudas (*Sphyraena picuda*), ten milkfish (*hakwa initoo*: *Chanos chanos*), sixty mullet-like species (*hakwasuli*), ten large trevally (*alia*: *Caranx* sp.), ten Spanish Mackerels (*alinga*: *Scomberomus solandari*), ten tunas (*Thunnus* sp.), fifty to sixty mackerel tunas (haukale: *Scomber* sp.), one hundred parrotfishes (*marato'ou*: *Scarus* sp.), and fifty large parrotfishes (*mara dikwali*: *Scarus* sp.).

Religious Factor

Another important reason for opening and closing the sea areas is related to funeral rites of important persons (*wane taloa*) such as a head of the descent group (*i.e.*, bigman) or a religious priest (*arai foa*). When he dies, the sea is claimed taboo for some period of time, and wooden poles are erected (*otongai uria maelana wane taloa*).

Case-4: When Gagame's father died, Kii closed the Abanafolo, Gwailuma, and Tabaa fishing areas, and then he made one big net. During three months or so after the death, the seas remained open. Then Kii closed the sea areas for sometime. This has religious significances to pray to ancestoral ghosts which are believed to bring abundance of fish resources. After a ceremonial fishing with a sacred net, a feast was held with sacrificial pigs. Then when the funeral rites ended the sea was again opened.

Case-5: In 1990 during my stay at Funa'afou, one great priest passed away. For the sake of mourning, over 200 relatives and kinsmen visited the island. During four days after his death, fishing (trolling and fish-drives) were undertaken for providing fish as food for visiting guests. A return gift from the son of the dead priest to the contributors of fish was given in an amount of ten to twenty Solomon dollars, or one bundle of red shell money.

In these cases, the opening and closing of the sea areas was arranged on a social rather

than an ecological basis. Generalized patterns of this sea tenure system could also be found in reserves of mangrove areas as a place of the ancestral foundation of the Lau, sacred reserves in Arhnem Land Aborigines (DAVIS, 1984), banning of fishing after the death of the head of the society such as chiefs and bigman (cf. JOHANNES, 1978a).

Ecological Factor

In any closed sea, resource potentials are known to change seasonally. During the wet season (*koburu*) fish retreat to deep waters and return to the shallows when the dry season (*ara*) has set in. Seasonality in fishing is widely known in the Pacific, as correlating to reproductive cycles and migration (for instance, see JOHANESS, 1981), and in the case of Lau it is noted that fishing techniques and fishing grounds are differentiated between the two seasons (AKIMICHI, 1978).

Seas abundant in fish are termed *asi fungu* while fishless seas are *asi gou*. Whatever the reason to lift taboos on fishing may be, the owner of the fishing grounds inspects them prior to fishing to assess the quantity of fish (*adaada uria ia*). Thus, the relative abundance of fish become an important factor in the decision-making process.

Case 6: In late 1989, two fishing grounds, Abanafolo and Tara'ana, were found to be fishless. The owner decided to declare the closing of the fishing grounds from January. As at the end of March, a school of fish (*imole ia*) were found, these two fishing grounds were then opened again for the months of April and May. However, they were again closed at the end of May. This last procedure was to increase fish and abundance of marine resources. In this case, the closing and opening of the fishing grounds was based on ecological reasons. It is also irrelevant to ancestor worships of the Lau people. The statement *labuooni agu ana ai,* which literally means "just standing poles" signifies this.

As shown above, the sea is usually reserved for procuring a great amount of fish. The temporary opening of fishing grounds lasts only a few days by which hundreds of fish could be taken. As a whole, the harvested fish became a media of exchange between the Lau and the agriculturalists, as well as among the Lau people. Fish was used in exchange for vegetables, as found in markets, canarium almond, and shell money. Consequently, the production of fish leads not only to immediate economic gains, but also, in a longer term, to the maintenance of a social exchange network. Clearly, the Lau sea tenure is a product of the adaptive strategies of the people to the natural and social environments, in which ecological, religious and socio-economic factors are molded in a system. It is neither a product of simple economization of the environment nor for the ideological social identity (CARRIER and CARRIER, 1989).

Discussion
—Sea Tenure and Its Transformation—

The sea tenure system of the Lau has not persisted harmoniously without change. Since independence, the Solomon Islands has encountered rapid economic and social changes. In

the fisheries sector, the promotion of coastal small-scale fisheries commenced in 1975 as a part of government programmes. Coolers made of FRP (*eski*) to keep fish fresh have been implemented in various areas in the Solomon Islands. Also, for the development and promotion of coastal fisheries, the government implemented several programmes. Foreign aid from Japan and other countries also has contributed, to some extent, to the socio-economic development of the country.

Under such circumstances, the people's conception and use of the sea has been neglected, or not fully understood, in regard to historical and cultural backgrounds. Unfortunately, this may lead to a failure of the application of any development programme that was perceived as effective. The present discussion, then, focuses upon making some suggestions on how to evaluate and preserve the cultural and social ethics under the contemporary situation of the sea tenure.

As we have seen, Lau sea tenure is characterized as a spatial articulation of three socio-ecological types; open access, patrilineage property, and communal property. How each sector is used under contemporary conditions is described below.

Communal Sea and Decline of Rabbitfish

In 1980s, coolers for fish storage with ice blocks were distributed as an aid for coastal fisheries development. This is mainly for the supply of fish for urban dwellers in Honiara, the capital of the Solomon Islands. Only a few individuals on the Funa'afou Island possess coolers or *eski,* but the problem caused by their introduction resulted in the shallows being overfished. As I have mentioned, sea-grass beds in the lagoon are for free use and there is no need to ask permission to anybody of the Lau if he can fish or not.

Owners of *eski* used to hire young fishermen to spear rabbitfish or *muu* using water-proof lights. As the Lau well recognize the season of spawning and fish runs of rabbitfish (AKIMICHI, 1978; HASSEJ *et al.*, 1977; JOHANNES, 1978b, 1981), people can easily obtain large numbers of fish. According to non-*eski* owners, the decline of rabbitfish populations is said to be due to night diving during the spawning season.

Bans of fishing during the spawning season is a well known measure in resource conservation. Such a practice has also been known by the Pacific Islanders such as in Hawaii, Tahiti, Palau, Tonga, Tokelau, Samoa, and Mangaia (See, JOHANNES, 1978a). Resource depletion of *muu* might be avoided, given the ban of fishing in these shallows. However, people do not feel any imperative to do so. This may be related to the prevalence of the idea of free and communal use (*mola*), basic to Lau cosmology and being deep-rooted since the foundation of the people to the lagoon area. It is then doubtful whether or not any effective measures can be dictated to this fishing zone.

Deep Sea and Development for Bottom Fishing

As one of the foreign aid programmes, transfer of technology of bottom line fishing started in 1990 in north Malaita as an experiment. Bottom line fishing for demersal fish was thought to be economically promising due to its high commercial value for exports and the relative abundance in terms of resource potential. Indeed, deep-sea snappers have not been taken

much by the Lau. This was mainly due to technical and environmental reasons (rough sea). The introduction of the electric line-wheeling machine, fishing boats equipped with brand-new, high-tech fishing gear however, has not helped the people.

As the number of fishing boats and gear was not enough for all the people, some fishermen expressed complaints on the inequity of the project. Here, the limited size of the foreign aid budget was not the main problem. One of the failures was a lack of people's practice to work in rotation, for coping with limited goods, and for avoiding social conflicts. The loan of fishing gear and the reciprocal return of part of the catch to the owner is common practice even in other areas of Melanesia (CARRIER and CARRIER, 1989). Even the fishing grounds are sometimes loaned in Aneityum of Vanuatu (AKIMICHI, 1990). The rotating use of fishing grounds are known in such fishing techniques as beach seining, and lift netting by applying a lottery system (ALEXANDER, 1982; AKIMICHI, 1985) where fishermen can modestly use the fishing grounds. In angling, a lottery system does not appear common. This may be due to the small space involved, unlike long line and other types of net fishing where a fairly big space is occupied.

Consequently, in the Lau, the absence of social incentive to enable fishing in rotation causes complaints. As conflicts over the use of the sea for open access often increase due to the introduction of new technology and commercial fishing (ACHESON, 1975), a change of the Lau's perception on the accessibility to deep sea is a matter of significant concern in the immediate future.

Sea Cucumber and Trochus Fishing in the Owned Area

In the late 1980s, a commercial enterprise for sea cucumber fishery came to the Lau area. Chinese people in Honiara directed this business, and the sea cucumber was processed on the island and then transported to the city by cargo ship.

There are several varieties of sea cucumber which are classed into three or four ranks according to economic values. Sea cucumber of the highest value cost 20 Solomon dollars per kilogram dry weight whereas the same unit the lowest cost 8 dollars. Of the varieties of sea cucumber, some inhabit shallow sand bottoms of up to three meters deep while others are found only in deep places. Certain species are distributed only at surf breaks and outer reef margins (SOUTH PACIFIC COMMISSION, 1979).

The sea exploited for sea cucumber by the Lau covers not only the shallows but also deep seas and surf zones. The latter is allocated as owned seas. As sea cucumber fishing is for obtaining cash, the owner of the sea tends to leave the sea open for a longer period than for providing fish to the agriculturalists. Moreover, no selective fishing for sea cucumber are conducted regarding of size and kinds, and even small individuals of fifteen cm long were collected. This may cause a depletion of sea cucumber resources in the area, as pointed out elsewhere in the Pacific (YAMAGUCHI, 1990).

Contrary to the sea cucumber, trochus shells (*Tectus niloticus*) which are found around surf breaks are better controlled than sea cucumber. Although the reefs are temporarily open for three or four days by the owner, many young divers collect trochus shells. As small shells are prohibited for exploitation legally in the Solomons (minimum size is 2.5 inches),

even local fishermen do not collect undersized shells. The allowable minimum size of shells can be easily measured with the palm of the hand as an index. In trochus-shell collecting or *suu karongo,* about ten to thirty percent of the collected shells are given as requital (*kwae*) from the diver to the owner of the fishing grounds (Table 2).

Table 2. Collecting activity of Trochus (*Tectus niloticus*) in the owned sea area (Aug. 26, 27, and 29, 1990)

I. D. No.	AUGUST 26	AUGUST 27	AUGUST 28	AUGUST 29
1	31 (15)[1]	45 (15)	×[2]	21 (10)
2	22 (6)	20 (5)	×	× (—)
3	18 (0)	12 (0)	×	6 (0)
4	21 (7)	13 (3)	×	20 (7)
5[3]	8 (0)	28 (0)	×	10 (0)
6	21 (7)	× (—)	×	6 (0)
7	23 (10)	13 (0)[4]	×	2 (0)
8	15 (5)	12 (4)	×	6 (0)
9	10 (3)	8 (2)	×	4 (0)
10	6 (2)	5 (0)	×	× (—)
11	31 (7)	17 (6)	×	12 (4)
12	20 (6)	21 (7)	×	8 (0)
13	0 (0)	6 (3)	×	× (—)
14	4 (0)	0 (0)	×	× (—)
15	32 (10)	× (—)	×	× (—)
Total	262 (78)	187 (45)		95 (21)
% of *kwae*[5]	78/254 30.7%	45/159 28.3%		21/85 24.7%

[1]: Parenthesis shows number of shells given to the owner as gift (*kwae*).
[2]: Collecting was not conducted.
[3]: Owner of the Reef
[4]: This man dived independently for Trochus on this day.
[5]: Gain by the owner is excluded from the figure.

As the claims of the reef were central to the Lau sea tenure, even under the impact of commercialization, there was only a minor change for the opening and closing the sea. In other cases, sea rights were subject to alteration under economic changes. For instance, people who converted to the Seventh Day Adventist Church in the Solomons were forbidden to eat *Tridacna* shell meat as well as scaleless fish and benthic animals such as crayfish and sea cucumber. Introduction of foreign fishing enterprises urged the people to pay attention to these shells as an income source. Hence, the local people began to claim exclusive rights on reefs where shells were abundant (BAINES, 1985). However, the use of the sea was not for the accumulation of shell currency, but cash. Whether or not in the future the Lau abandon fishing for obtaining shell currency depends on the decision of the owner of the fishing grounds.

It is clear from the above examples that under changing socio-economic conditions resource use changes. First, in the shallows in the lagoon, rabbitfish have been overfished where communal ethics dominate. Open deep sea areas are expected to develop in the future, if well managed, or might suffer from the "Tragedy of the Commons". Similarly, in Vanuatu deep-sea fishing projects have been promoted nationwide, in which a lack of infrastructure for the transport and supply of ice and refrigerators brought about unsuccessful

results in some village (AKIMICHI, 1990). At the same time, it is worried that technological innovation may cause native conflict due to the absence of relevant socio-economic preconditions. Third, owned sea areas may be conserved ecologically, to some extent, but not through infrequent openings, but by controlling species specific standards.

Overall, it can be said that several factors have contributed to the transformation of the Lau sea tenure. The shallows for communal use now need certain restrictions, while deep waters of open access may also require limited entry. Further, and more significantly, the opening of the owned sea has come to be for economic purposes; *i.e.*, cash income, rather than for social exchanges with the agricultural people. This might cause serious changes in Lau society with the understanding that the sea tenure system of the Lau is based on considerations of the ecology and sociology, planners and aid givers can help to make an orderly and ecologically sound change possible.

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