

RESEARCH REPORTS IN THE ECONOMICS OF GIANT CLAM MARICULTURE

Working Paper No. 17

Traditional Reef and Lagoon Tenure in Western
Samoa and Its Implications for Giant Clam
Mariculture

by

T'eo I.J. Fairbairn

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**Traditional Reef and Lagoon Tenure in Western Samoa and
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¹ Research for this paper has been undertaken as a part of Australian Centre for International Agricultural Research (ACIAR) Project 8823 'Economics of Giant Clam Mariculture'. (See next page for more information).

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The technical feasibility of culturing giant clams for food and for restocking tropical reefs was established in an earlier ACIAR project. This project is studying the economics of giant clam mariculture, to determine the potential for an industry. Researchers will evaluate international trade statistics on giant clams, establish whether there is a substantial market for them and where the major overseas markets would be. They will determine the industry prospects for Australia, New Zealand and South Pacific countries, and which countries have property right factors that are most favourable for commercial-scale giant clam mariculture. Estimates will be made of production/cost functions intrinsic in both the nursery and growth phases of clam mariculture, with special attention to such factors as economies of scale and sensitivity of production levels to market prices.

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Traditional Reef and Lagoon Tenure in Western Samoa and Its Implications for Giant Clam Mariculture

ABSTRACT

As with many other Pacific island countries (e.g, Fiji), in Western Samoa the system of property rights on reef and lagoon areas is characterised by legal ownership by the state combined with customary ownership of fishing rights by indigenous village groups. These groups hold customary fishing and related rights over adjacent reef and lagoon areas to which all members of the group can enjoy relatively unrestricted access. Overall control of the customary fishing ground of a particular group is exercised by a village council or *fono*, composed of those who hold chiefly status.

Western Samoa is generously endowed with reef and lagoon habitats suitable for clam and related forms of mariculture. However, to gain access to such areas for mariculture purposes, it is necessary to obtain the consent of the villagers through their village council. Whether or not such consent is obtained appears to depend on the villagers' assessment of the nature and extent of the benefits that are likely to result from a mariculture project. Village support is essential not only to gain access to a project site but also to ensure continuing cooperation on the part of villages during the implementation and production stage. Particularly important is village support to prevent fishing and other forms of intrusion on the project site.

Keywords: Western Samoa, Apia, Marine tenure, mariculture.

JEL Classification: Q57, Q31

GLOSSARY

Samoan Terms

Aiga	family, relative tuna (skipjack)
aku	tuna (skipjack)
alia	twin-hulled fishing craft
ali'i	chief
atule	big-eyed scad
aumaga	group of untitled males
fa'amo'a	group fishing by women
faipule	district representative
fono	council, assembly for deliberation
lama	night fishing on canoes shark
malie	shark
mata	group fishing by men
Pulenu'u	government agent in a village
sa	a village edict or prohibition taro
talo	taro
tapu	sacred
tautai	master fisherman
to'ana'i	Sunday meal following church service
tuiga	group fishing practice

Traditional Reef and Lagoon Tenure in Western Samoa and Its Implications for Giant Clam Mariculture

1. INTRODUCTION

Western Samoa is unusually well endowed with reef and lagoon areas suitable for giant clam and other forms of mariculture. These reef and lagoon areas are owned by the state but customary ownership of fishing rights is recognised and remains firmly-entrenched. Samoan fishing rights over reefs and lagoons are based on customary usage of village fishing grounds and apply on an individual village basis. The responsibility for regulating fishing and related activities in these areas lies with the village council or *fono*, comprising the chiefly group of *ali'i* and *faipule*. Fishing rights can be exercised by all members of a particular village, subject to any restriction that may have been imposed by the village chiefs (and central government).

Official efforts have been made over the years to promote giant clam cultivation, largely through the nurturing and distribution of breeding stocks to villagers. Attempts by a private sector group to cultivate giant clams on an offshore island - Namu'a Island lying off the east coast of Upolu is currently attracting considerable interest, and is worthy of official support. Western Samoa has the potential for major giant clam development: it has ample reef and lagoon areas (most of it depleted due to over-fishing in the past) suitable for such activity, while there is clear evidence of strong unsatisfied demand in the local market.

To gain access to reef and lagoon habitats for purposes of giant clam cultivation, it is necessary to the consent of the village. This consent can be through the village *fono*, with possible assistance from the Fisheries Division, Ministry of Agriculture, Forests and Fisheries, and the resident village government agent - the *pulenu'u*. Support for a project can be expected to be forthcoming if the village leaders are convinced that it will bring about tangible and practical benefits to the village, although not necessarily in the form of direct financial benefits. Once village support is assured, customary forms of controls and sanctions are available and can be applied to ensure that villagers do not intrude into project site and facilities.

2. BACKGROUND

Western Samoa is located in the Central Pacific region, between 13° and 15° south latitude and 168° and 173° longitude. It is composed of two main islands, Upolu and Savai'i, and a number of small offshore islands or islets. Land area totals 2,935 km² of which Upolu accounts for 1,113 km² and Savai'i 1,726 km². The group lies approximately 2,900 km north-east of Auckland and 4,000 km north-east of Sydney. (See Map 1, appended). Western Samoa's closest island neighbours are American Samoa, the Kingdom of Tonga, Wallis, and Tokelau.

Western Samoa's total population is currently around 166,000, of which 76 per cent is found on Upolu and 24 per cent on Savai'i. There are two small inhabited islands. Apia the nation's capital and administrative centre, accounts for around 24 per cent of the total population, peri-urban coastal villages of north-west Upolu for another 24 per cent. The population is homogeneous, almost wholly of Samoan extraction. The natural rate of population growth is high (around 2.5% p.a.), but due to heavy emigration, the actual annual growth rate is low at about 0.6 per cent. New Zealand and the United States are the primary destinations for Samoan migrants.

GDP is approximately WS\$200 million (1988) which is equivalent to WS\$700 per capita¹ Economic structure is dominated by the primary sector -agriculture, forestry and fisheries - which accounts for half of both employment and GDP, and around 90 per cent of export earnings. The village subsistence component of the primary sector remains substantial. The services sector is large and dominated by government and tourism while manufacturing is small, accounting for only 6 per cent of GDP.

Exports are dominated by coconut products in the form of oil, cream, meal and copra, and in 1988 these products accounted for WS\$18.3 million out of total export earnings of WS\$29.7 million, or 61 per cent. The only other significant export items are cocoa and taro. In common with many other Pacific island countries, Western Samoa's export earnings are usually substantially below the value of imports giving rise to large trade deficits in the of balance of payments. In 1988, while export earnings totalled WS\$31.4 million, imports were recorded at WS\$155.1 million, a shortfall of WS\$124.1 million. Such deficits possible only

¹ In. 1988 (Dec), one Western Samoan tala was worth Australian \$0.54; at the time of my (Oct., 1990) fieldwork the Australian equivalent was \$0.56.

because of heavy inflows of private transfers from overseas kinsmen and external aid grants when combined, are usually large enough to offset the trade deficit.

Present development objectives, as outlined in the current development plan (Government of Western Samoa, 1987, p.25), emphasise the need to achieve sustained economic growth as a means of realising improvements in the quality of life of all Samoans. Other objectives include: the attainment of greater national self-reliance; the widening of economic opportunities; and the protection of the natural environment. Growth strategy is based on the capacity to achieve increased agricultural production through improved productivity and product diversification, and also relies on realising the development potential of fisheries, tourism and light manufacturing.

Fisheries is a major component of the Western Samoa economy, particularly at the rural village level, and the potential for future development appears to be considerable. A major potential lies in a more intensive exploitation of the outer reef waters of the country's Exclusive Economic Zone or EEZ. Although this EEZ is comparatively small (approximately 120,000 km²), it is apparently relatively well stocked with tuna, mostly skipjack. There is also a significant potential for exploiting bottom fish resources (mainly snapper) on several locations (notably sea banks and seamounts). However, the nearshore reef and lagoon waters presently offer little scope for substantial increases in yield because of heavy over-exploitation in the past.

According to the current development plan (Government of Western Samoa 1987, p. 56), the overriding objective in fisheries is to develop the country's marine resources as a means of promoting economic growth and national self-reliance. Increased production for local consumption is a major priority in the immediate term, but the establishment of large-scale export-oriented ventures will also be an important goal. The expansion of local production is emphasised because of the perceived need to improve nutrition, reduce the heavy dependence on imports, and expand employment and income-earning opportunities in the rural village sector.

Developing Western Samoa's fisheries resources is the responsibility of the Fisheries Division which is part of the Ministry of Agriculture, Forestry and Fisheries. In recent years, the Fisheries Division has been involved in several major programmes to strengthen the country's fisheries: these include a project to build fishing boats (*alia*) suitable for village-

based artisanal fishing; the provision of fish aggregating devices (FADs) to facilitate tuna fishing in deep waters; and a strengthening of the Division's extension and advisory services. Efforts are also being made to assess offshore bottom fishing resources and investigate possibilities for major export industry based on deep sea fishing.

In recent years the Fisheries Division has been active promoting aquaculture/mariculture, although much of the effort has been essentially experimental in nature. Past efforts to propagate giant clams for distribution as breeding stock for villages have been particularly notable. In some degree, this effort has been prompted by the fact that the natural stock of giant clams in the country has declined sharply as a result of over-exploitation.

The Fisheries Division has also attempted to foster the cultivation of Green Mussel (*Perna viridis*) and Giant Malaysian Freshwater Prawns (*Macrobrachium rosenbergii*) but with limited success in both cases. Areas of current interest include the propagation of giant clams, the Pacific oyster and trochus. For purposes of breeding, the Fisheries Division maintains several tanks at its Apia headquarters for clams, trochus and several other species.

The development and regulatory role of the Fisheries Division is guided by several pieces of legislation including: the Fisheries Protection Act 1972; the Fish Dynamiting Act 1972; and Fisheries Act 1988. However, except for the Fish Dynamiting Act, such legislation mainly focuses on commercial fishing ventures as opposed to fishing on Samoan villagers' customary fishing grounds.

Official policy towards the exploitation and management of Samoan fishing activity on nearshore waters can be described as one of minimum intervention. This stems from the fact that, in practice, the primacy of Samoan villager rights over their customary fishing is recognised, and these rights are fiercely by these villagers. Combined with this reality is a belief that the traditional methods that Samoans have employed over time to manage and control their marine resources can still work effectively. Continued reliance on customary methods of control makes sense for the added reason that the Fisheries Division simply does not have the resources to monitor village-based fisheries activities and to enforce fisheries regulations throughout the country's many coastal villages.

The capacity of village chiefs to exercise their traditional authority at the village level has been strengthened by the recent passing of the Village *Fono* Bill (1990). Essentially an amendment to the Constitution, this legislation provides for the *ali'i* and *faipule*, i.e. the group

of village chiefs and orators, to exercise their chiefly authority in accordance with Samoan custom and usage. In the fisheries area, the new legislation enhances the power of *ali'i* and *faipule* in relation to controlling fishing and related activities on customary reef and lagoon areas. Under the provision of the Fisheries Act 1988, any regulation promulgated by the chiefs, through the village *fono*, can become a national by-law. However, for it to become a by-law, the proposed regulation must first be submitted to the Fisheries Division for consideration, signed by the Director of the Department of Agriculture, Forests and Fisheries, and then gazetted. (These village regulations are now also commonly announced over radio.)

3. THE PURPOSE OF THE STUDY

This study examines the system of property rights on nearshore marine areas i.e. reef, lagoons and mangrove areas that prevail in Western Samoa. The study is one of four case studies of marine property rights in the South Pacific region carried out as a component of a broader research project on the subject: The Economics of Giant Clam Mariculture, which is funded by ACIAR, Canberra, and coordinated by Professor C.A. Tisdell, the Department of Economics, the University of Queensland Brisbane. This study of marine property rights in the South Pacific entails carrying out the following tasks:

1. A general review of reef and marine property rights in the South Pacific as far as these may affect the development of giant clam mariculture, with more in- depth overview for selected countries.
2. Consideration of customary reef tenure and sharing arrangements in relation to reef resources and in relation productive activities.
3. Consideration will be given to the institutional type of mariculture development that may be successful.

The present case study adds to those already completed for Fiji, Vanuatu and the Kingdom of Tonga, and a comprehensive report outlining the main findings relating to marine property rights in the South Pacific is under preparation.

For the purpose of collecting information, the writer visited Western Samoa during the period October 1-12, 1990. Discussions on marine tenure in Western Samoa were carried out with senior staff of the Ministry of Agriculture, Forests and Fisheries, officers of the Fisheries Division and other sources including those from the private sector. As well, visits were made to three rural locations to inspect mariculture projects and to seek the views of village leaders

on the subject of customary marine tenure. Specifically, the areas visited were: Fusi village, Manana village and Namu'a Island.

The village of Fusi is situated on the south coast of Upolu and is part of the Safata District (see Map 2, appended). The village has access to one of the largest and best-sheltered bay areas in the country and is also well endowed with agricultural land. Fusi has a population of approximately 550, six family groups (*aiga*), and 53 resident *matai* (around 12 other *matai* reside outside the village). The neighbouring villages are Vaie'e to the west and Fausaga to the east. The cultivation of taro, coconut and copra and the trapping of crabs are the main economic activities.

Manana village, commonly referred to as Manana Uta, is located on the extreme north-west tip of Upolu and is part of the community of Manono Island which lies several kilometres offshore (see Map 1). The lagoon area under the control of Manono community is extensive and mainly comprises the waters lying between the village and the island. Population is an estimated 1,200 and there are around 100 *matai* (excluding those not residing in the village). Lacking access to good agricultural land, the village is forced to rely heavily on fishing for the Apia market. The main subsistence crops are taro and coconut.

Namu'a Island is one of several islands lying a short distance from the coast of the Aleipata District on the south-east coast of Upolu (see Map 3, appended). The island has a classic volcanic structure but has been heavily eroded on the seaward (outer) end by wave action. Owned by the government, the island is approximately 15 ha in size and its only residents are a chief and his wife from the village: of Malaela on Upolu, who work as caretakers for a giant clam project on Namu'a (see following section). The entire area between Namu'a Island and the Upolu coast comprises lagoon waters.

4. MARICULTURE: THE RECENT EXPERIENCE

As noted above, the Fisheries Division has played an active part in promoting mariculture, its efforts being particularly notable for green mussels, Pacific oysters and giant clams.

Attempts to promote the farming of green mussels began in the early 1980s. The lead was taken by the Fisheries Division which established rafts and related facilities for green mussel growing on three lagoon sites, including those at Asau village in Savai'i and Fusi village in

Upolu. Green mussel spats were imported from French Polynesia and placed on rafts at the three sites. These projects progressed well at the development stages and appeared set to become firmly established as a promising new rural industry. Convinced that the villagers could manage the projects themselves, the Fisheries Division withdrew, leaving them fully responsible. Unfortunately, this optimism was not borne out; the villagers could not sustain development and it was not long before each project lost momentum and collapsed. Poor management and supervision by the villagers, in some cases combined with lack of cooperation among village groups (e.g. women groups), were said to be largely responsible for the failure.

The farming of green mussels remains technically and ecologically feasible but a more effective approach to development seems an essential requirement for success.

A project to cultivate Pacific oysters was established in mid-1990 at Fusi village. It was initiated by an officer of the Fisheries Division whose father held a *matai* title in the village. Fusi itself seemed an excellent site for this kind of venture as it has extensive bay areas with sheltered and shallow waters. Largely an experimental project closely monitored by the Fisheries Division (which does regular checks), the project occupies an area of around 50 by 25 metres. Facilities include a series of shelves or ramps supported by poles driven into the bay floor. A local villager acts as a caretaker using a small boat provided by the Fisheries Division.

The project is strongly supported by the village which has imposed a set of penalties or fines for anyone who enters or takes oysters from the project. The first crop of oysters will be harvested in December (1990) and it is hoped that a large proportion will be sold locally.

The country's first major attempt at giant clam mariculture began in 1989 on Namu'a Island. The project was established by a private company, Namu'a Aquaculture, which has five local shareholders, assisted by the Fisheries Division. It is largely the inspiration of a young Apia entrepreneur, Peter Meredith, the country's leading diver, who saw the potential for giant clam farming on the large and relatively protected lagoon waters of Namu'a Island. The securing of the project site was facilitated by the fact that Peter Meredith had family links with Malaela village which is opposite Namu'a on Upolu, and the fact that his father held a *matai* title in that village.

Present operations are confined to a small lagoon area measuring around 20 by 15 metres in

size, extending from Namu'a's main beach front. From government the company has leased a total lagoon area of 15 ha plus a few acres of land, under a 20 year lease with right to renew for a further 20 years. Project facilities include several metal ramps suspended above the lagoon floor by steel or wooden poles, and around 80 trays for the clams. The clam numbers around 1,800 and is of varying age up to 2.5 years with the main species being *Tridacna derasa*, *Tridacna gigas* and *Tridacna squamosa*. (Restocking was necessary, mainly broodstock from the Fisheries Division, after heavy destruction by Cyclone Ofa earlier in 1990.)

The project relies heavily on the Fisheries Division for technical assistance, especially in relation to marine biology. A local villager has been appointed as caretaker for the project, and so far support from the mainland village has been excellent. The immediate aim of the project is to consolidate what has already been achieved and improve facilities to ensure future viability. Among the top priorities are the installation of hatcheries (breeding tanks), a laboratory and processing equipment. Major aims are to develop the capacity to supply clams to the local market, to provide breeding stock to interested villagers and to develop an export capacity.

The project has considerable potential for development, especially because of Peter Meredith's strong commitment to the project and the availability of suitable lagoon areas under long-term lease. However, the ultimate success of the project will depend on the capacity to upgrade facilities and the availability of finance to do this. (A loan application for \$300,000 has been submitted to the Development Bank of Western Samoa but a decision has yet to be made.) The project is deserving of official support, including government assistance to secure overseas technical and financial resources.

5. MARINE TENURE

Up till now, Western Samoa's system of reef and lagoon tenure has not been the subject of detailed study, but it been commented upon by a number of observers. One of earliest observers was W. von Bulow, a German national long-time resident of Apia during the turn of the century. In 1902 he published a short account of Samoan native fishing rights (see Appendix B), and drew attention to the elaborate system of ownership rights on customary fishing grounds, which encompassed the area lying approximately between the beach and the outer edge of the reef. As reported by von Bulow, ownership rights were held by village

communities, extended families or individual title-holders and the coastal areas over which these rights applied were clearly defined. Owners exercised fishing and other rights (e.g. to take marine sediments) over their fishing grounds, but were subject to certain 'duties' imposed by the village authorities. These duties included the obligation to turn over certain fish species (e.g. turtles) to the village assembly (*fono*) or a particular chief, and the obligation to obey village decrees (*sa*) forbidding fishing on reefs and lagoons for a defined period of time.

More recently, J.E. Johannes (1982) reported on Western Samoa's reef and lagoon resource management situation for the Government of Western Samoa and the South Pacific Commission, Noumea. In his report, Johannes offered a few observations on traditional Samoan fishing rights and how these evolved and have been modified over time. Johannes pointed to the lack of basic information on Samoan fishing rights - information which he thought could play a vital part in the management and utilisation of the country's coastal resources - and urged that a comprehensive study be undertaken into the marine environment including reef and marine tenure.

The most fundamental change that has occurred in marine tenure in Western Samoa, certainly since von Bulow's time, has been the transfer of ownership of customary fishing areas from families and related groups to the state. As in many other Pacific island countries, this change took place during the period of colonial rule and the system of ownership that was then introduced has persisted to the present day. The notable exception was Vanuatu where, through the Constitution, all land and customary fishing grounds that had been alienated reverted back to customary owners.

In contemporary Samoa, the system of property rights on reef and lagoon areas is characterised by state ownership (as part of the country's territorial and EEZ areas) and customary ownership of fishing rights on these waters. These fishing rights apply to customary fishing areas that villages have claimed since time immemorial and are well defined and demarcated. (By legislation these fishing rights can extend out to a limit of five miles from the mean high water mark.)

As is common in the South Pacific region, fishing rights over customary fishing grounds belong to individual villages. As a general rule, each village, as a largely autonomous functioning unit, can claim exclusive rights over its designated customary fishing grounds.

These fishing grounds normally comprise reef, lagoon and mangrove areas extending seaward from the land boundaries of the village to the edge of fringing reefs. The size of these fishing grounds varies enormously depending on the extent of the coastal land boundary of a village and its reef and lagoon configuration. However, in the majority of cases, the lagoon waters out to the edge of the reef measure well over 1 km, and are therefore extensive.

On several locations on the main island of Upolu, the fishing rights of villages extend to the lagoon areas surrounding off-shore islands. Examples are a number of villages in Aleipata such as Malaela and Mutiatele, which traditionally fished on the lagoons of the offshore islands of Namu'a and Nuutele. The villagers of Manono, both on Manono Island and Manono village on Upolu, traditionally fish on the lagoon areas that lie between Upolu and Manono Island, covering a distance of around 3-4 kms. In general, the presence of offshore islands greatly increases the size of the lagoon waters available to the main villages for fishing and related activities.

Rights to fish on the customary fishing grounds of a neighbouring village (or villages) are still found and exercised. Where such 'outside' fishing occurs, it usually takes place on the outer edge of the lagoon, as far away as possible from the host village. I came across several examples of such fishing, for example, in Fusi village where people of the neighbouring villages were permitted to fish on lagoon waters beyond the main bay area; and two sub-villages of Savaia and Tafagamanu at Lefaga which share the same reef and lagoon areas. Fishing by outsiders can only be carried out with the approval, tacit or overt, of the host village and such arrangements are normally made on a reciprocal basis.

Until recent times, the exercising of fishing rights on the customary fishing grounds of other villages was apparently fairly widespread. I was told, for example, that the villagers of Manono used the fishing grounds of villages at least ten kilometres away (e.g. Leulumoega, Fasito'outa and Mulifanua) but this had ceased when these villages forbade such fishing. (However, Manono fishermen can still fish on lagoon waters extending out from the airport - a distance of about 10 km to the east - as villagers who used to live in this area have been relocated.) However, cases where outside fishing is allowed are no longer common. The reason for the decline largely relates to increasing demands on reef resources as a result of population pressure and fishing for commercial purposes. In recent times these pressures have forced many villages to ban outside fishing and to reserve reef and lagoon resources for the home villager's exclusive use.

Many coastal villages permit fishing by people from inland villages who lack direct access to the coast. These rights are usually exercised by those inland villages that are not far from the coast, and were acquired through historical and family ties. (Many inland villages were originally settled by coastal villagers as a result of population pressure.) I came across several examples of fishing by inland villagers including fishing by Manunu village on the fishing grounds of Saluafata and Luatuanu'u, and by Magiagi village on the coastal zones of Fagali'i and Moata'a.

The customary fishing grounds of a particular village are effectively common property in the sense that all villagers are free to exercise fishing rights as members of that village, subject to any restrictions that may have been imposed by the village *fono* or by the central government. However, in practice, certain other customary restraints may affect the freedom of individual fishermen to fish in these waters. Thus, in most villages, households located on the water's edge can claim a form of occupant's rights over adjacent lagoon areas, normally around 5-10 metres from the land at high tide. Other villages will tend to respect this right and do so by keeping a respectable distance from the area concerned. Fishing rights may be further curtailed in cases where a village admits outside fishing; such a sharing arrangement effectively deprives host villagers of the opportunity to exercise sole access to lagoon resources.

Certain customary practices regarding the catching of particular species of fish still persists in some villages; in most cases, such practices affect the fishing rights of outside villagers. Thus, in 1960, van Pel (in Johannes, 1982, p. 12) noted that around Manono Island, only the inhabitants may catch mullet and *atule*; and Johannes (1982, p. 12) reported that in Savai'i fishing for 'whitebait' during the annual run is the exclusive right of the villagers of Gataivai. In Fusi, the trapping of crabs was restricted to local villagers. In relation to turtles, a common custom is to present the catch to the village chiefs for customary distribution. No doubt, many other forms of customary arrangements can be found in contemporary Samoa.

The rights of Samoan villagers to exercise their customary fishing rights in reef and lagoon areas are fully recognised. In practice, however, these rights go beyond fishing and related activities; they also confer custodial rights to manage and carry out related activities in these waters as was true in pre-colonial days. Their role as custodians of the reef and lagoons is clear from my discussions with village leaders. A common expression used by these leaders is: 'Matou te vaa'iga le gataifale' - we are responsible for looking after and overseeing our

reefs and lagoons. This statement implies a right or obligation, to manage and regulate fishing activities on these waters. The recent passing of the Village Fono Bill, as noted earlier, has served to reinforce the role of individual villages as custodians of reefs and lagoons.

While ownership of customary fishing rights belongs to the village as a whole, the control and regulation of village activity on reef and lagoon areas is exercised by the village council or *fono*. Each village has its own *fono* comprising all those holding chiefly status i.e. chiefs and orators who are collectively known as *ali'i* and *faipule*. The *fono*, which usually meets weekly (normally on a Monday), is a form of local government at the village level, responsible for managing and regulating village affairs based on Samoan tradition. The authority of the *ali'i* and *faipule* extends to the management and control of reef and lagoon areas.

The powers of the *ali'i* and *faipule*, as exercised through the village *fono*, are considerable, and are expressed through customary methods. This group can impose traditional sanctions, the *sa* or *tapu*, upon the village and can support them with penalties of various kinds and degree of severity. These penalties are commonly imposed in the form of fines in cash or goods (such as pigs, canned food, bread etc.), and in extreme cases, banishment from the village. The application of customary sanctions may involve the banning of fishing altogether for a specific period, the catching of a particular species or the use of a particular fishing practice.

Village *sa* have been imposed to ban fishing based on use of dynamite and *ava niugini* (*Derrii elliptica*) –a mixture made from a noxious plant originally brought from New Guinea. It was also apparent that many villages have bans on night fishing (*lama*) and the use of gill nets. The main reasons for these latter restrictions arise from the difficulties of controlling the activity of night fishermen, and in the case of net fishing, to prevent resource depletion.

Disputes between villages over fishing rights are rare, and if they break out, are settled through customary channels, i.e. through discussion between the respective village *fono*. During fieldwork, the only dispute that came to my notice concerned Nu'utele Island, a small offshore island lying off Aleipata District, Ownership is being contested by the three leading chiefs of the district (Sagapolutele, Fuataga and Tofua), and in this case, the dispute has been brought before the Land and Titles Court, Apia, for resolution. The dispute began in 1986 and may take some time yet to resolve.

6. SHARING ACTIVITY

Fishing by village groups is still common and applies to both fishing nearshore and beyond the reef. However, such fishing now takes place less frequently than in earlier times and involves mostly untitled males and women.

The most common form of group fishing arrangement is the *mata*. The *mata* involves fishing from canoes in waters using spears, slings and, sometimes, gill nets. The fishermen are usually young untitled males led by a master fisherman, the *tautai*, and the fishing group may vary from several canoes (and fishermen) to as many as twenty craft. Sharing arrangements in relation to the catch vary depending on whether fishing is carried out for the purpose of meeting village needs on one hand or of satisfying family needs.

The organising of a *mata* to satisfy the needs of the village normally takes place in response to a special occasion that would call for a meeting of village chiefs. Here, the specific purpose of the *mata* is to provide fish to help feed the village leaders and, consequently, the catch is pooled and individual fishermen do not share in. For most rural villages in Samoa, this fishing for communal needs occurs periodically, depending on how often the *matai* assemble for special meetings.

The carrying out of *mata* to meet the needs of individual families in the village takes place on a more regular basis. It normally takes place on Saturdays so as to provide fresh fish for the Sunday meal (*to'ana'i*). Here, each member of the group is free to keep his catch to feed his family or dispose of as he sees fit.

A method of group fishing by women that used to be widely practised but is now much less common is the *fa'amo'a*. This fishing method involves a group of women forming a circle and driving the fish into a basket strategically placed in the coral community and disguised as a natural shelter for the fish. To force the fish out of the coral, the women would beat the coral with a long stick shaped like a golf club. A basket made from coconut material is used to trap the fish. The catch was usually shared equally among the participants.

A variant of the *fa'amo'a* is the *tuiiga*, which was also popular form of group fishing during earlier times. A long stick was used to scare the fish out of their coral shelter and a net was used as a trap.

In earlier times, group fishing on outer reefs, usually for tuna (*aku*) and shark (*malie*), was carried out regularly, but now appears to have given way to more individual efforts, especially with the growing use of motorised crafts. Other group fishing activity includes that carried out by women in shallow lagoon waters (usually at low tide). Normally, two or three women would take part and it usually entails foraging for and collecting a variety of shell fish and other marine growths. An element of sharing is usually involved in these efforts.

7. DEVELOPMENT APPROACHES

The potential for clam mariculture in Western Samoa is considerable, possibly one of the best in the South Pacific region. The country is generously endowed with good natural habitats for giant clams – numerous coastal locations that are reasonably protected from winds and with extensive areas of clear sheltered lagoon waters. (The extent of these reef and lagoon areas is estimated at 23,000 ha – i.e. water less than 50 meters deep; Johannes 1982, p.2). This potential has to be considered alongside the fact that a large part of the country's reef and lagoon waters is impoverished and the rejuvenation of such areas through giant clam mariculture would represent a major social benefit. It is also apparent that there exists a large unsatisfied demand for giant clams in the domestic market.

Practically the entire coast of Upolu is encircled by fringing reefs that usually extend out from shore by around 1km. Upolu is therefore well endowed with lagoon waters that could be the basis for clam mariculture. Reef and lagoon areas in Savai'i are less extensive than in Upolu (a large part of the coast of Savai'i is covered by lava) but, nonetheless, Savai'i has large coastal areas that are suitable for the cultivation of giant clams.

While Western Samoa offers an abundance of possible locations suitable on ecological grounds for the cultivation of giant clams, a further factor that has to be considered is the population density of nearby villages. There are clear advantages in selecting a project site on an area of low population density so as to minimise the danger of human intervention, especially village fishing. On this score, reef and lagoon waters that lie some distance away from the main village centers can be attractive. On this criterion, most of the villages located in the north-west of Upolu - stretching from the Apia township as far west as the international airport area - would rank poorly as possible sites.

According to senior officers of the Fisheries Division, some of the best reef and lagoon areas

for purposes of giant clam mariculture can be found on the south-west and south coast of Upolu. Those areas that were considered particularly attractive - in part, because of low population densities - includes Fagalei and other areas near Lefaga such as Fagaiofu Bay and Falevai village. The villages of Matautu and Salamumu were also favoured. There is also scope for giant clam mariculture in several islands offshore from Upolu, including Nu'utele and Nu'usafe'e.

It is apparent that the extensive southern coast of Upolu, particularly lagoon areas that are not subject to heavy fishing by nearby villages, offer considerable scope for giant clams. Selected areas in Savai'i as well as the other two inhabited islands of Manono and Upolima, both lying between the north-west side of Upolu and the south-eastern section of Savai'i, also potentially attractive.

Given the nature of customary marine tenure in Western Samoa, a key requirement for the establishment of a giant clam mariculture project on reef and lagoon waters is the consent of the village holding fishing rights over such areas. Consent must come from the *ali'i* and *faipule* group who act on behalf of the village. The decision of the *ali'i* and *faipule* is, by custom, binding on all villagers. An essential step is to submit the project proposal to the *ali'i* and *faipule* for consideration. This submission can be done through the village *pulenu'u* who, as the local representative of the central government, can request the village chiefs to meet to discuss the merits of the project. The Fisheries Division will need to be represented at these discussions to assist in explaining the project to the chiefs, to provide technical information if needed, and generally to facilitate the process of discussion and negotiation. The Fisheries Division, as the official agency in this area, can fill a vital role as an intermediary between the developer and the village.

Establishing a commercial giant clam project on the reef and lagoon areas of a village requires close collaboration between the developer and the village authorities i.e. the *ali'i* and *faipule*. As in the case of Namu'a Acquaculture, this collaboration may take place on an informal basis with local villagers not involved as equity partners in the venture. However, various forms of joint venture arrangements may also be considered to allow villagers to play a more direct role (e.g. as directors) in the venture.

Co-operative arrangements with village groups such as Womens' Committees and the group of untitled males - the *aumaga* - do not appear to offer real possibilities for collaboration.

(Non-traditional groups such as cooperatives show limited possibilities as partners since they are not generally active in Samoan villages.) The reasons for collaborating with the *ali'i* and *faipule* is that they are the highest authority in the village and can speak on behalf of all villagers.

An important requirement is to ensure that the project is carefully explained to the villagers so they have a clear understanding of the nature and purpose of the project. It is particularly important that the villagers understand the aims of the project, possible benefits for the village, the implications for their fishing rights and need to observe any regulations or decrees issued by the village in order to protect the project from intrusion by villagers.

The response by villagers toward a giant clam project will depend on what villagers perceive as the likely benefits to them. It was clear from my discussions with village leaders that these benefits need not come in the form of money payments. Some informants stressed the value of such a project for the future well-being of the village and family groups, and the possibility of sharing in some way in the harvest when the project had become a going concern. Others highlighted the possible benefits of a project in terms of improved nutrition for the village people, while others conceived of possible benefits realised in the form of improvements to local roads, water and power facilities. Informants at Manana village saw the chance to sell clams to a nearby holiday resort (under construction) as a potential major benefit.

A formal agreement between the village and the developer which would spell out project aims and conditions as well as the responsibilities of the respective party, may be necessary, but is not absolutely essential. However, it is imperative that each party has a clear understanding of its responsibilities and obligations. Important features that need to be understood include: the exact area of the lagoon waters that will be developed as a project site, specific measures that need to be taken to protect the project, and what penalties the village is willing to use to discourage poaching and interfering with project equipment and general facilities. An indication of how villages are to benefit from a successful project should also be considered.

Those responsible for the project should have a firm understanding of the nature of customary obligations and how these obligations can be handled. Villagers will tend to expect those involved in the project to show that they are willing to act as though they were part of the village community and show this by making an occasional contribution - cash or in kind- to

the village, especially on special occasions. These contributions, which perhaps can be looked upon as "price" that has to be paid for the use of reef and lagoon areas, can be made in the form of cash or food - including imported foodstuffs such as canned fish and meat, bread, sugar, tea and the like. (Gifts in the form of building materials are also appropriate.) Such contributions can be made during a major village event such as the official opening of a church, school or other infrastructure items or a special meeting of the village *fono*. During my visit to the giant clam project at Namu'a Island, I learned that the project coordinator was contemplating providing gifts of food (bread, biscuits and canned fish) to an upcoming meeting of the village *maitai* of Malaela village as a gesture of goodwill to the village for its cooperation to date. This meeting was planned to discuss the local agricultural situation, and the value of the proposed gift from the project was expected to amount to around WS\$400.

Once consent is obtained, a village through the *ali'i* is in a position to provide considerable practical support for a project. Agreement by the chiefs implies acceptance by the village as a whole. Sanctions, in the form of the traditional *sa*, can be levied as a means of protecting the project from intrusion and interference by both local and outside villagers. Village chiefs also have the power to impose penalties in support of sanctions. Support through the appointment of a local villager to act as a caretaker for the project can also be secured.

The power of village chiefs to apply customary sanctions is widespread among the village community. In relation to the existing mariculture projects in both Fusi and Malaela villages, I learned that the village chiefs were prepared to make these sanctions even more severe to ensure effective compliance.

The willingness of Fusi and Malaela villagers to severe sanctions to protect their mariculture (respectively oysters and giant clams) represents a clear commitment to their projects. In Fusi, the penalty for breaking the *sa* was a fine of WS\$100 plus a contribution of 100 *talo* and one pig. Of the cash fine, an amount of WS\$50 was to be paid to any villager who had informed the village chiefs of the infringement (the other WS\$50 would accrue to the village). The customary fines imposed by Malaela village to protect the giant clam at Namu'a Island were a cash fine (to be determined by the chiefs), 100 *talo* and one pig, but these penalties would double or triple for more serious offences.

From what has been said above, it is clear that Samoan villages, through their traditional village *fono*, have at their disposal an arsenal of potentially powerful mechanisms for

supporting giant clam and other forms of mariculture. The development of a giant clam project can be facilitated by having to deal with a single authority, i.e. the *ali'i* and *faipule* (through the village *fono*), and once consent has been given, the developer can negotiate with the village chiefs over the question of imposing village sanctions and what forms these sanctions should take. It is vital, however, for the developer to continue to enjoy acceptance by the village community and this can be done by ensuring that the village stands to gain some tangible benefit from the project, including that received in the form of customary gifts.

8. CONCLUSION

The system of marine property rights found in Western Samoa is similar to that operating in many other Pacific island countries, for example, Fiji. This system is characterised by state ownership of reef and lagoon areas (as part of the country's territorial waters) and customary ownership of fishing and related rights on these waters. These customary fishing rights are held by individual villages and apply to village fishing grounds that have been established and defined over time. The power to, regulate and enforce fishing activity on the fishing grounds is held by the village *fono*, comprising the group of *ali'i* and *faipule*. Subject to any regulation made by the *fono* and/or the central government, all villagers are free to exercise fishing rights on reef and lagoon areas belonging to the village.

Western Samoa is generously endowed with extensive reef and lagoon areas that could provide suitable natural habitats for giant clams, the south and south-west coasts of Upolu being particularly attractive. To gain access to a village reef and lagoon site for giant clam mariculture, the consent of the village *fono* is required, and in this regard the Fisheries Division and the village *pulenu'u* can play a valuable part in negotiating for village support. Support for a project will depend on how the villagers perceive project benefits, but once permission is given, the village chief can apply customary sanctions as a means of protecting the project activity from intrusion by villagers.

9. ACKNOWLEDGEMENT

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of the Fisheries Division, especially Ueta Fa'asili, Tanielu Sua, Leon P. Zann, and Antonio Mulipola. The usual caveat applies.

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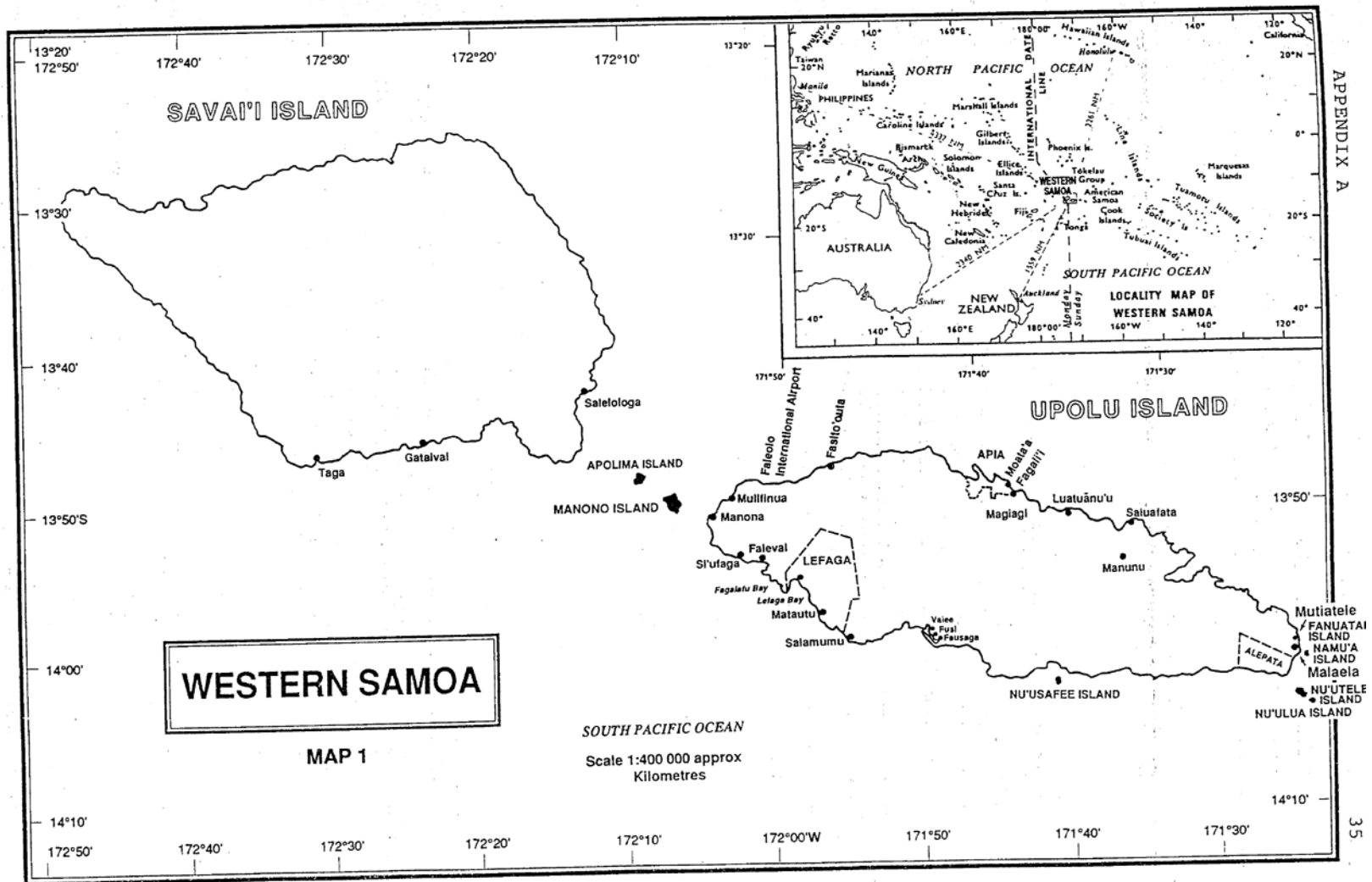
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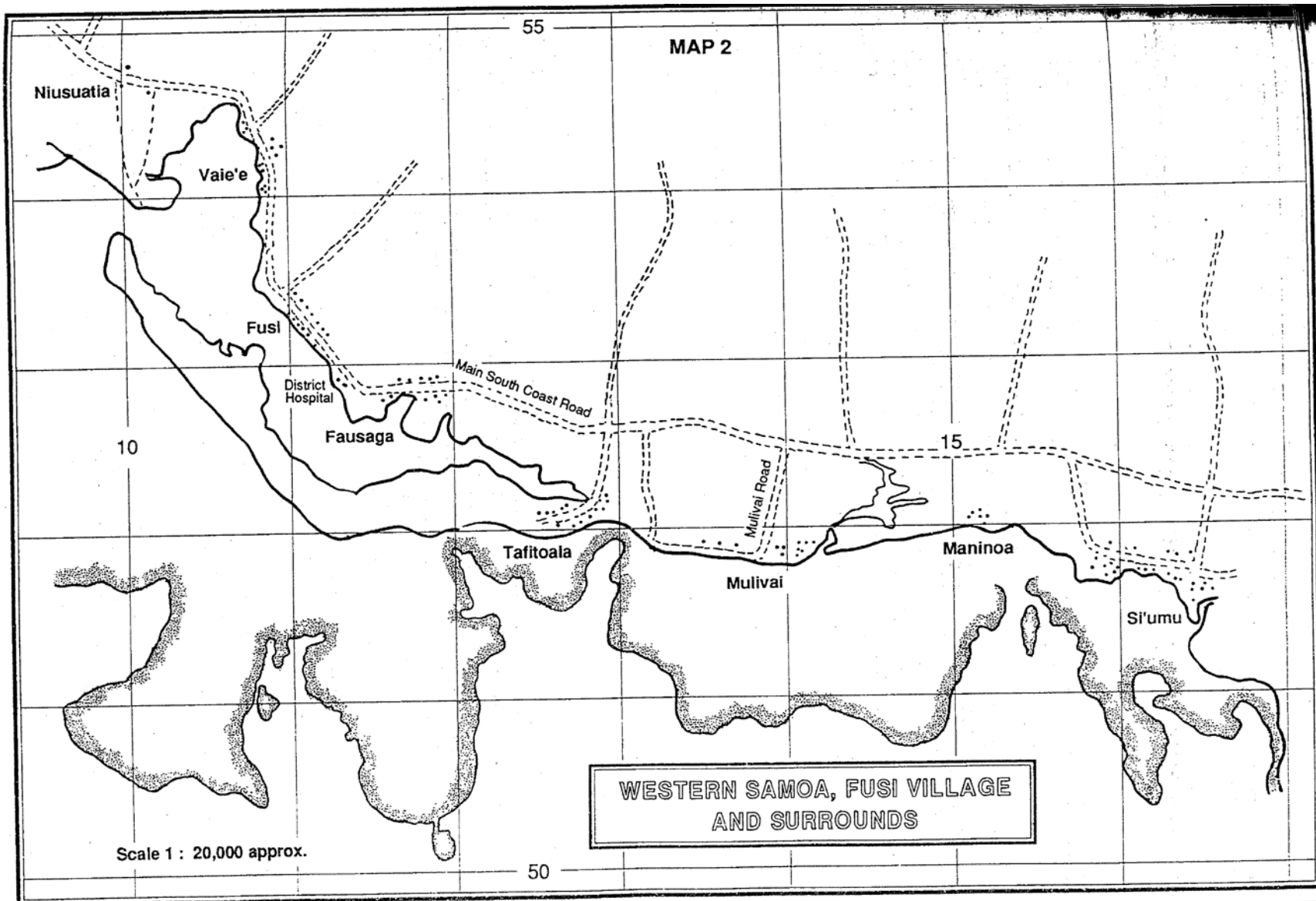
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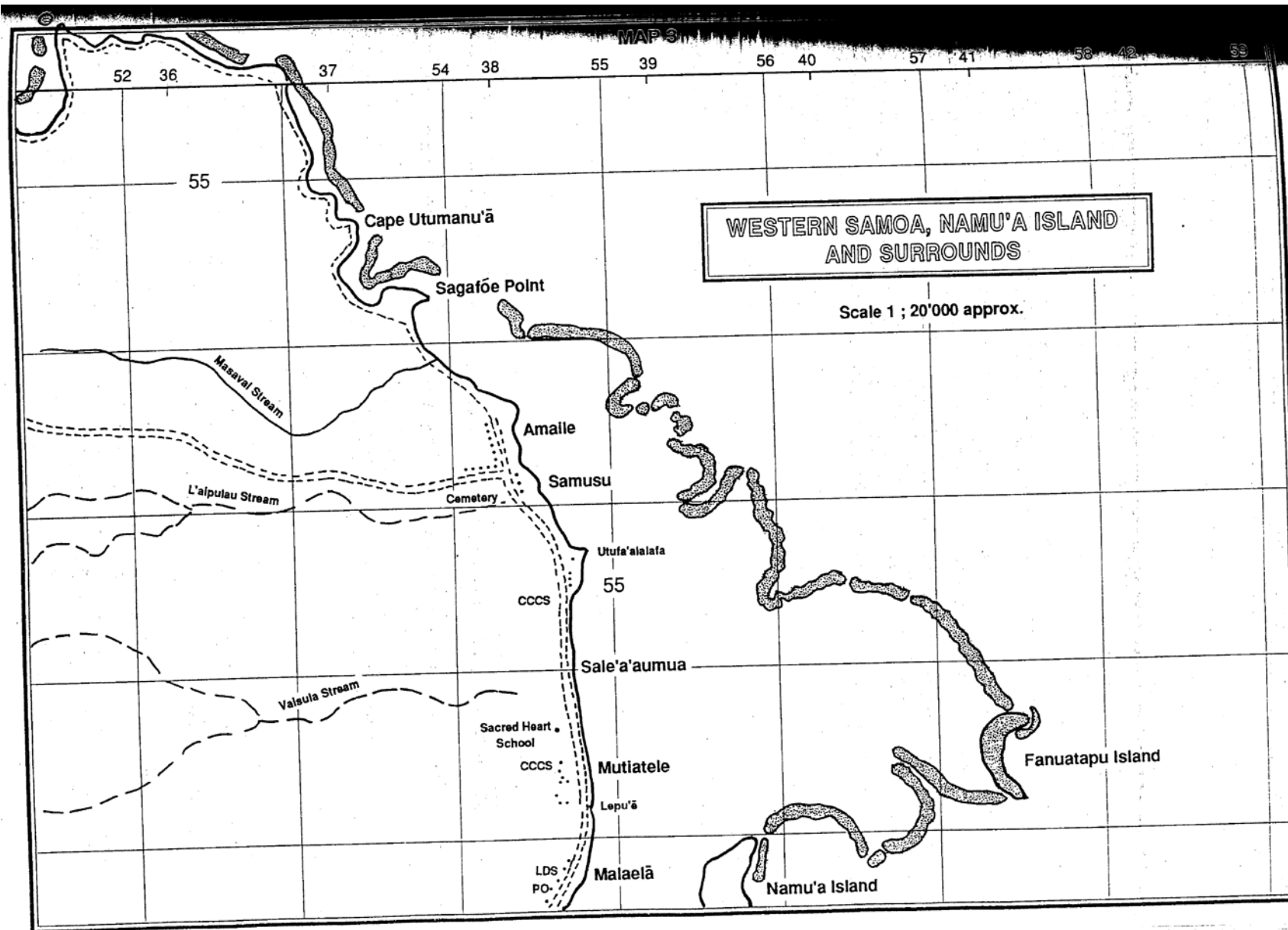
APPENDIX A



APPENDIX A

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MAP 3

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Cape Utumanu'a

Sagafoe Point

WESTERN SAMOA, NAMU'A ISLAND AND SURROUNDS

Scale 1 : 20'000 approx.

Maseval Stream

Amaille

L'alpulu Stream

Cemetery

Samusu

Utufa'alalala

55

CCCS

Sale'a'aumua

Valsula Stream

Sacred Heart School

CCCS

Mutiatele

Lepu'a

Fanuatapu Island

LDS PO

Malaela

Namu'a Island

APPENDIX B

Fishing Rights of the Natives of German Samoa

By W. von Bulow
in Globus LXX XII, p. 40-41 (1902).
(Translated from German by Christa Johannes)

Fishing rights are a peculiarity of Samoan customary rights. The regulations relating to fishing rights are as many and various as the regulations relating to customary rights concerning the possession, acquisition and disposal of land. The natives' subsistence comes mainly from agriculture and fishing.

It is not surprising, therefore, that these two sources of livelihood are specially protected by customary rights. According to customary law the boundary between land and sea is the line which marks the waves crashing against the coast at the time of mean high water mark, namely the "high water mark". The space between this high water mark and the respective water's edge at any particular time is considered a traffic route.

The space between the traffic route and the outer edge of the reef, that is, the "lagoon", is considered the fishing ground.

Just as all land in Samoa has its owner - even if in the time it has become more and more difficult in some cases to determine the rightful owner so all Samoan fishing grounds have their owners.

These owners are either communities, chiefs' families, or else ownership rights or certain parts of ownership rights with the possession of particular areas of a fishing ground. (Translators's note - the meaning of the second half of the sentence seems unclear.)

These rights are old and have remained valid into most recent times.

Offences against these laws were punished by the local assembly up to the most recent times.

Fishing outside the reefs, "to the ends of the world", to Tutuila and Manua in the East, to

Toelau in the North, the Uea and Viti in the West and the Foga mama in the South is free. But there are valid rules even for fishing outside the reef (particularly in relation to shark fishing - *lepa malie*- and bonito fishing- *alo atu*), rules that are determined by the guild of fishermen, the *tautai*, and which are enforced by the latter. These are outside the framework of this work.

Fishing rights are generally considered as non-saleable in Samoa. Nevertheless in the 1870's it happened that native fishing grounds were surrendered to strangers; this, however, in part without obtaining the assent of the state. Thus it happened, for example, with the so-called "little harbour" of the harbour of Apia.

On the Island of Upolu, where the natives are no longer so singularly dependent of the yields from their fishing grounds as formerly when the number of foreigners was smaller and the opportunity of making a living (working for wages?) was less, interest in the former fishing grounds seems to have already greatly declined.

On the island of Savai'i, on the other hand, the old customs still continue in their purest form, the boundaries of fishing rights are still least obliterated, and the effort and joy in fishing are still most pronounced.

Therefore, it is on this island that infringements into fishing rights are felt most acutely. The worst infringement of this kind is dynamiting within the reef. It is without doubt that in a circumference of many meters all sea animals die where a single 1/4 cartridge of this material explodes. As fish mostly spawn within the reefs, it is quite conceivable that a well-stocked fishing ground can be ruined - depopulated - within a very short time.

These fishing grounds, which carry with them ownership rights or parts of ownership rights which favour village communities, extended families, or individual title-holders, are known. Known both according to their general position as well as according to their boundaries in relation each other.

These fishing grounds make up part of the wealth of the owner and therefore should be protected by law today just as much as any other possession - something which until this day has actually been the case in the villages.

Fishing rights entitle the owner to every kind of fishing on his fishing ground, so the piling up

of coral and stone heaps as hiding places for fish, and to setting up any number of fish and crab traps.

The duties of an owner of a fishing ground are in general the following:

1. If he catches certain large species of fish (the turtle, *laumei*, is also considered as "fish" - *ia*) he has to turn them over to the village assembly or in some villages to particular chiefs or to particular speakers (translator's note- talking chiefs?).
2. In addition he has to follow the orders of the village assembly if for a certain periods it forbids the catching of atule (South Sea Herring) in order for the assembly to gain time to prepare to catch this fish in the *lauoa* (a. large drag-net) , or
3. If the assembly declares the ocean "forbidden" - *sa* - because a high chief died, or because during a transfer of the remains of a long-deceased person from the present grave to a new grave his bones were "bathe" by the sea.
4. The owner has to allow his own village or neighbouring localities to cast their large drag-net; but to do so without searching through the stone heaps he has set up himself,
5. As well as to allow everyone to cross his fishing ground while dragging a fishing lure, 'any time of day or night.

In civilized countries fishing with explosives is heavily punished.

It is hoped that studying the customary rights of the Samoans concerning fishing will continue to their fair treatment by foreigners and to the maintenance of our fishing supply.

APPENDIX C

List of Persons Consulted in Apia

Atoa K. Leupolu	Registrar, Land and Titles Court
Tupuola T. Leupolu	Director of Agriculture, Ministry of Agriculture, Forests and Fisheries
Ueta Fa'asili	Chief Fisheries Officer, Fisheries Division
Leiataua Pesa	<i>Ali'i</i> , Manono village
Luamanuvae B. Schwenke	<i>Tulafale</i> , Malaela village
Peter Meredith	Director, Namu'a Aquaculture, Apia
Muliagatele I. Reti	Assistant Director of Environment and Conservation, Department of Lands and the Environment
Antonio Mulipola	Fisheries Officer, Fisheries Division
Seumanutafa A. Tiavolo	Deputy Director) Department of Lands and the Environment
Soalaupule L. Bell	<i>Tulafale</i> , Fusi village
Tala Telea	<i>Pulenu'u</i> , Manono village
Tanielu Sua	Marine Biologist, Fisheries Division
Mataina Te'o	Chief Librarian, Nelson Memorial Library, Apia
Leon P. Zann	Fisheries Resources Advisor, FAO/UNDP, Fisheries Division

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