

SOUTH PACIFIC COMMISSION

A FISHERIES RECONNAISSANCE TO WALLIS ISLAND -

July 24th - August 7th, 1969

by

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Fisheries Officer.

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SUMMARY

CURRENT SITUATION

Primitive subsistence fisheries are in a state of serious decline at Wallis Island; fewer fishermen now follow this vocation, and lagoon fish stocks subjected to specialised and undesirable fishing methods, are decreasing. Traditional fishing boats are heavy and difficult to manoeuvre, and fishermen are reluctant to fish on the open ocean beyond the encircling reef. Although the island population have a steady income, remitted by relatives employed overseas, the supply of local fresh fish is insufficient to meet their demands and must be supplemented by imported canned fish.

RECOMMENDATIONS

The early formation of a Wallis Island Fishermen's Society, locally financed, but encouraged and given tangible support from Government resources, and technical advice from other agencies, is important at this time. Improved fishing boats are required if fishermen are to work outside the reefs and benefit from resources at present untapped. The recruitment of an expert fisherman and the establishment of ancillary services to carry out a vigorous fishing programme outside the reef, and train Wallisian fishermen in improved fishing methods, will assist the proposed fishermen's society to expand their activities and gradually increase the supplies of fresh fish demanded by a fish hungry population with reasonable cash purchasing power. A reference list of recommendations is given at Annex No. 10.

REQUIREMENTS

A Revolving Loan Fund is required to initiate the construction of an improved type of fishing canoe, make available basic items of fishing gear, and outboard engines with a stock of spare parts. A three-year fisheries development and expansion programme, possibly financed from the Fond d'investissement et de développement économique et social (F.I.D.E.S.) will require the services of an expert fisherman, a 30-35 foot sea-going fishing launch, and fishing gear. A detailed list of requirements is included at Annex No. 5.

ASSIGNMENT

In response to a request from the Territory of Wallis and Futuna, the Fisheries Officer of the South Pacific Commission visited Wallis Island from July 24th to August 7th, 1969.

The objects of this visit were to investigate, in addition to the problems connected with the depletion of lagoon resources, the possible establishment of offshore fisheries beyond the reefs and shores of the Group, to determine suitable types of fishing craft and equipment for local fisheries development, and to establish, in consultation with the Director of Agriculture at Wallis, a programme designed to provide more detailed information on potential reef and lagoon resources.

Reference: Letters Nos. 299 of 17/5/68,
504 of 29/8/68,
590 of 5/11/68,
256 of 2/6/69,
319 of 4/7/69,

from Le Second Commissaire,
Délégation Française à la Commission du Pacifique Sud, Nouméa.

ACKNOWLEDGMENTS

The writer had the good fortune to be invited to live "en famille" with the Director of Agriculture, M.B. Pasquelin, Mme Pasquelin, and their two charming children at Mata Utu. M. Pasquelin, himself an enthusiastic fisherman, with an excellent knowledge of the Wallis Island people and of the many problems and possibilities entailed in fisheries development, proved to be a most helpful guide and hospitable host, and special thanks are due to him.

TRAVEL DIARY - July 24th - August 7th

- | | |
|------------------|--|
| <u>July 24th</u> | 1. Tontouta-Nadi-Wallis Island. |
| | 2. Discussions with M. B. Pasquelin, Director of Agriculture; inspection of local outrigger canoes and fishing launch. |
| <u>July 25th</u> | 3. Tour of Island; visited crater lake. |
| | 4. Discussions on financial and organizational background of development projects, M. Pasquelin. |
| | 5. H.J. Bach, Administrateur Supérieur, Wallis & Futuna, introduction and explanation of purpose of visit. |
| <u>July 26th</u> | 6. To sea in Fishing Launch "Combessa" trolling outside reef, east, south, and west of island. 18 Fish mainly barracuda; 1 dogtooth tuna of 48 kilos. Phleuger blue mullet spoons very successful. |

July 27th

7. Visit to Nukuhifola Island; diving in lagoon.

July 28th

8. Interview with Lavelua Tomasi Kulimoetoke (King of Wallis Island).
 9. Visit to local facilities, public works, power house, local cold storage, m.v. "MOANA", hotel.
 10. Revision of Programme with M. Pasquelin.

July 29th

11. With Georges Pambrun, Assistant d'Elevage, to see two crater lakes and other bodies of fresh water; mangrove areas.
 12. Diving survey of proposed M.O.P. culture nursery midway between Nukuhione and Nukuhifala Islands at north end of Mata Utu Bay; toured proposed growing area, and landed on Faïoa Island to see turtle beaches leading up from S.E. face of reef.

July 30th

13. Meeting with fishermen.
 14. Visit to local stores to see supplies of fishing gear.
 15. Called on M.M. Hatem, Chef de Brigade Gendarmerie National, to inspect his collection of turtle shells and preserved turtles.
 16. Heavy rain and wind. Revision of programme, discussions on SPIFDA requests, and M. Pasquelin's fishing records.

July 31st

17. M. Pasquelin in "Combessa" to rendezvous with m.v. "MOANA" and to land M. Bach. "MOANA" delayed, entered lagoon 1400 hours. Trolling - blue mullet spoon takes 26 kilo Wahu.
 18. Preliminary report sketch.

August 1st

19. Strong wind, heavy rain, fishing operations cancelled. Continued report, consultations with M. Pasquelin. Visited meteorological station.

August 2nd

20. Several hours heavy rain during night; wind still strong, sea moderate to rough. Continued report.
 21. Constructing 20-hook sharkline.
 22. First rough draft of report discussed with M. Pasquelin.

- August 3rd 23. Surveyed fish weir sites, Pt. Lausikula. Plans for trap made up; also box net.
24. Discussed immediate 4 month experimental fishing programme for M. Pasquelin's boat and crew.
25. Discussed various types of boats suitable for Wallis and suggested methods of construction, plans, etc.
26. Demonstrated plans of fish weirs, box nets and live bait baskets to Fishermen.
- August 4th 27. Trolling in force 4/5. 6 fish - all on blue mullet spoons, 3 Barracuda, 1 Caranx, 2 Dogtooth tuna; used fish for sharkline bait and shot 20 hookline rig off Mata Utu.
- August 5th 28. Hauled sharkline; 2 female nurse sharks total 400 lbs. Force 4 choppy sea. Launch difficult to manoeuvre and not much room. Perhaps a good shark potential easily operated by outrigger canoes with local materials in the lagoon since shark is acceptable (although at lower price than fresh fish) to local population. Fish weirs can provide bait. (400 lbs of shark for 12 lbs. bait).
29. One hour interview with M. Bach; points in report; SPIFDA; work programme; etc.
- August 6th 30. Final meeting with fishermen.
- August 7th 31. Wallis Island - Tontouta.

PERSONNEL INTERVIEWED IN CHRONOLOGICAL ORDER

M. B. Pasquelin, Director of Agriculture.

M. J. Bach, Administrator of Wallis and Futuna.

M. G. Peltier, Director of Public Works.

M. P. Magne, Chief of Meteorological Service, Wallis/Futuna.

M. H. Chautard, Businessman.

M. B. Brial, Businessman.

M. P. Tailhan, Commandant d'Aérodrome.

M. C. Bouchereau, Aéroport Maintenance Engineer.

M. M. Hatem, Chef de Brigade Gendarmerie National, W/F.

M. M. Bejin, Businessman.

Tomasi Kulimoetoke, Lavelua, (or Chief of Wallis Island)

Mr. H. Gelnaw, Skipper American Trimaran "ARIEL".

Kamali Lenisio, Spiny Lobster Fisherman.

Sosimon Langikula, Fisherman.

Simon Langikula, Fisherman, Owner of two boats.

Saumoe Sefo, Fisherman, Boat Owner.
 Kusi Fapito, Fisherman, Boat Owner.
 Paulo Lavvia, Service de l'Agriculture.
 Sakalia Sialehaamoa, Service de l'Agriculture.
 Aloisio Samea, Service de l'Agriculture.
 Georges Pambrun, Assistant d'Elevage, Service de l'Agriculture.
 Jean-Yves Appriou, Carpenter/Artisan, Workshop.

FACILITIES AT WALLIS ISLAND

COMMUNICATIONS

Currently (August 1969) Wallis Island is served by a monthly UTA commercial DC4 flight, originating at Noumea, and returning to Noumea via Nadi Airport, Fiji, the following day. Air Pacific Company provide a weekly Charter service with a 4/5 seat Beechcraft aircraft, making the return flight on the same day. Improvements to the local air strip will (April 1970) enable UTA to establish a service using Caravelle Aircraft.

A passenger and cargo service by sea is provided monthly by the motor-vessel "MOANA", originating at Noumea, with calls at Suva, Wallis, Futuna, Wallis, New Hebrides, completing the round trip at Noumea.

SHORESIDE FACILITIES

Wallis Island is well provided with unsurfaced roads, generally suitable for most types of vehicles.

There is a T-head jetty extending into the lagoon at Mata Utu, with over 20 feet depth of water alongside the quay face, which has taken vessels up to 5,000 tons. The main reef pass in the southern part of the main reef should be used with caution, and the ship channel to Mata Utu marked by beacons, but unlit by night, must be negotiated with care.

A flying boat ramp, of Second World War origin, in a fair state of preservation may be found near Point Halalo on the south shore of the main island. This ramp, and anchorage in the lee of the island is serviced by a channel, reputed to have a least depth of 19 feet, leading to the south pass of Honikulu.

A power house recently constructed contains three generating units providing 60, 60 and 45 kilowatts respectively. Electricity is supplied to the town of Mata Utu, and there is an extension to the T-head jetty. There are no ice-making facilities on the island; two local stores operate small cold stores with a combined capacity of eight cubic metres. The motor vessel "MOANA" usually carries a portable cold store unit with a capacity of 8 cubic metres at 12/18 F.

Supplies of diesel oil and petrol are available at Mata Utu.

Three small launches are maintained at Mata Utu, one by the Administration, two privately. Servicing of marine engines at Mata Utu could be improved; few spares are stocked. These are usually ordered from Noumea and Fiji for delivery by the monthly shipping service. There are currently 17 outboard engines in use, and two inboard marine engines.

Accommodation may be obtained at the sea front hotel in Mata Utu, where five twin-bed chalets are maintained by the Société Moličina, Manager, M. B. Brial. Meals are provided on a daily rate, or "en pension", the average daily charge for all services being approximately \$A 10. This accommodation is completely occupied, overnight, on the arrival of a UTA flight, on the monthly service, and guests must find accommodation elsewhere.

A Meteorological station is maintained at Mata Utu. A local telephone service is operated by the Post Office, and also radio communication with Futuna. International telephone and telegram services are available.

The water supply of Mata Utu depends primarily on a number of individual bore hole pumps and storage tanks, and is generally of good quality.

For the benefit of intending visitors to Wallis Island, particularly those susceptible to mosquito bites, it is advisable to wear slacks and long sleeve shirts after 5 p.m., since mosquitoes are prolific on the island. Apparently malaria is not known but elephantiasis is common; however there is little danger of contracting this latter disease under a stay of 3 months.

LOCAL FISHING SITUATION

It was stated that in 1969 there was a population of some 5,000 people on Wallis Island, 3,000 people on Futuna Island, and over 6,000 from both islands working in New Caledonia. Among the 5,000 people living on Wallis, less than 50 fishermen operate 8 to 10 outrigger canoes, and then only on Saturdays - not during the week. Fresh fish is available to immediate families and friends, and a limited amount for sale to others for the customary Sunday meal. The vast majority of the population, even though they have money to purchase fish (from remittances received regularly from relatives in Noumea) must resort to tinned pilchards for their needs.

It is estimated that a crew of three men handling for fish on the reef will in a night's fishing catch 30/40 fish, weighing between 90/120 lbs, and it is unlikely that total weekly Saturday landings may reach half a ton of fish. No statistics exist but verbal reports would indicate that a generation ago, some 50/60 outrigger canoes and over 200 fishermen, were able to land 80/100 fish per night's fishing giving a total catch approaching 10 tons, for the same size of population. The indications are, from this hearsay evidence, that not only has the catch effort per man dropped by over 50%, but also the number of casual fishermen has decreased from around 200 to 50, a loss of roughly 75% of the previous catching effort. From such evidence, one may even suggest that should this trend continue, then fishing will die out completely amongst the Wallisians if they continue to fish only inside the lagoon.

It is of interest to record the recollections of some of the old surviving fishermen who are quite positive that about the time of the First World War (1914-18) there were a number of Chinese and Tokelaun Islanders residing in Wallis Island, and that these fishermen in outrigger canoes, with crews supplemented by Wallisians, caught schooling tuna outside the reef on the open ocean, using poles and mother-of-pearl shell lures. With crews of four men per boat, two paddling and two fishing they were capable of landing over 80 tuna per day's fishing. With the departure of the Tokelauns and Chinese, this method quickly declined and was forgotten. One old fisherman produced for inspection a PA'A or M.O.P. lure which he had in his house from those days. Yet in nearby Western Samoa local fishermen are currently using the same method, in two-man canoes, and in season, can land 40-60 tuna per canoe each day.

Wallisian fishermen themselves admit a definite reluctance to fishing outside the reef, and this appears to be due to two main causes, the first of which is an ingrained fear of sharks on the

open ocean. This is a basic fear unsupported, as the fishermen readily admit, by any history of shark attack or accident. The second deterrent to working offshore is attributed to the heavy clumsy qualities of the traditional outrigger canoes in use, which are difficult to manoeuvre through the passes in the reef, and at sea, in anything but the fairest conditions.

With this reluctance of the fishermen to go beyond the reef, a decline in the fishing population, a diminishing return from the lagoon, and a decreasing incentive to exert themselves due to a steady flow of cash remittances from Noumea, it would appear that the Wallisian population will increasingly depend on imported canned fish and canned beef to supplement their readily available diet of taro, yam and bananas, and that the local fishing effort, such as it is, will be even further reduced. Is it indeed possible at this late stage to revive fishing at Wallis?

There are two hopeful indications that may shed some light on this gloomy situation. The painstakingly recorded fishing log kept by M.B. Pasquelin, Director of Agriculture, Mata Utu, himself an enthusiastic sports fisherman, using a 20' power launch, equipped with trolling tangons, is analysed at Appendix No. I. This record indicates that such an outfit is a viable concern because of the cash purchasing power of fish hungry Wallisians at Mata Utu. From the record, two men operating this type of unit for 8 hours per day, five days per week, would be capable of earning a gross income in excess of 45,000 French Pacific francs per month. Operating costs could be reduced by the installation of a marine diesel engine, and catch rates increased by the use of improved trolling lures which have been demonstrated. It should be noted that this income is derived from trolling operations only, and that it is estimated that an additional 10,000 F.P. could be realised from occasional night handlining operations during the month. No account is given of other sources of income, for instance from shark line operations, shark nets, trap fishing, or box nets.

Note: Wallisians operating such a vessel would be in a better position to secure almost double the price per kilo for fresh fish from the local cash market, hence the figures given by M. Pasquelin of 40 francs/kilo might be increased to 100 francs with a consequent final estimate of gross earnings per month, from trolling operations of up to 100,000 francs.

The second ray of hope lies with a small group of energetic Wallisian Island Fishermen who are anxious to form a Fishermen's Society on a regularly constituted basis, and step by step, with the active encouragement

and support of the Administration develop a viable and expanding fishing operation for local supply. This group is not deterred by the present situation and would appear determined to go into operation quickly. Some suggestions on the formation of such a group are given at Annex No. 3. As pointed out in Annex No. 3 and Annex No. 4 the establishment of a fisheries office at Mata Utu would ensure that the revival of fishing in Wallis Island is given the technical advice and assistance which is required to ensure an increased supply of fish to the population, and proposals for the establishment of such a service, and the detailed requirements are given at Annexes No. 4 and No. 5 respectively.

ANNEX 2LOCAL TUNA RESOURCE

The presence of a tuna resource in the waters near Wallis Island is a matter of speculation. No data exists to prove or disprove such a resource. Local fishermen seldom venture beyond the reef nowadays and the catching of the Oceanic Banto (*Katsuo pelamis*) using the mother-of-pearl shell lure has been forgotten. Dogtooth tuna (*Gymnosarda nuda*), Spanish Mackerel (*Scombenomus commersoni*), Wahu (*Acanthocybium solandri*) have all been caught on the ocean side of the reef, and there a single yellowfin tuna (*Neothunnus macropterus*) is recorded in the fishing log compiled by M. Pasquelin, and analysed at Appendix No. I. Casual observations by local fishermen of White Cap Noddy Tern and White Tern behaviour outside the reef lead them to believe that schools of Bonito pass close to the island. Sightings of foreign tuna longline vessels have frequently been made by Wallis Islanders, and occasionally such vessels, based on Pago Pago in American Samoa, and Levuka in Fiji, take shelter within the lagoon at Wallis Island, or barter fish for fresh meat and vegetables, as has been observed at Futuna Island. This evidence would indicate that there is a stock of tuna and other large pelagic fishes in the area, but at the present level of the fishing effort in Wallis Island this is beyond the reach of local fishermen using traditional boats and equipment.

The investigation of what is possibly a deep swimming stock of tuna, by the operation of small scale tuna longlines in the waters within reasonable reach of the island, could be carried out by a 30'/40' seagoing fishing boat as part of the programme proposed for an expert fisherman established at Wallis Island as suggested in Annex No. 4. The success of this experimental tuna fishing programme would depend to a great extent on a regular supply of bait fish, and the possibility of obtaining frozen Japanese Sauri bait from Levuka, Fiji, for delivery on the motor vessel "Moana" to Wallis would need to be investigated. The use of a simple manually operated Thermistor Thermometer to investigate the presence and vertical movement of thermoclines in the area would also be of value.

It may however be possible to arrange a short survey visit of 8-10 days by the Fisheries Research Vessel "Coriolis", operated by the Office de la Recherche Scientifique et Technique Outre-Mer, at Noumea to make a quick preliminary assessment of the situation as it exists during the best local fishing season, between October and December. Under such a programme it should be possible to carry out Bathythermograph transits along the four main compass quadrants, N.E., S and W of the island, from close inshore to a distance of say, 10/15 miles offshore, to investigate the presence of thermoclines in the area, which may indicate the depths at which the larger tunas and other fish may be more concentrated.

This primary operation should take less than a week, and should the observations warrant, three or four tuna longline operations, using 300-500 hooks which would give an initial indication of the possible hook rate, size of fish available, and species, at that time of the year. This information would be a valuable guide to an expert fisherman, should a fisheries programme be established at Wallis, as small scale tuna longline operations from 30'/40' vessels have been proved technically feasible, and viable operations in other areas, including Fiji, Tonga and Tahiti.

In the event that an expert fisherman be assigned to Wallis to carry out an experimental fishing programme, one of his tasks would be to attempt the revival of the mother-of-pearl shell lure technique for catching small tunas near the island. If for example the expert fisherman is recruited from a tuna fishing community on the Atlantic coast of France, he should be routed through Papeete in Tahiti and spend a week acquiring practice in this method on board the very successful small tuna boats operating out of that port. It is suggested also, that M. Stephen Elacott, a fisheries agent in the Tahiti Fisheries Service, and himself a practised fisherman in this particular method, should be seconded temporarily for an initial period of three months to assist the Wallis Island Fisheries Service in reviving this technique. M. Elacott successfully demonstrated the manufacture from local mother-of-pearl shell, of the tuna lures, and also the fishing techniques required, to fisheries extension workers and fishermen, from Papua and New Guinea, the Trust Territory of the Pacific Islands, and Guam at the Third Fisheries Training Centre held at Koror, Palau, Western Caroline Islands, in mid-1968.

WALLIS ISLAND FISHERMEN'S SOCIETY

During the visit of the SPC Fisheries Officer to Wallis Island a meeting of a small group of leading fishermen was held in the offices of the Service de l'Agriculture to discuss current fisheries development and the needs for further expansion. It was obvious from these discussions that there is a local demand for the formation of a Wallis Island Fishermen's Society to be managed, and financed, mainly from local resources, but also advised and given technical assistance, and partial financial support through a revolving loan fund, as part of the services of a fisheries agency proposed to be established in Mata Utu with French Territorial Budget, and/or "FIDES" support.

Commencing as a small pilot venture the Society would be managed under a group of 5 fishermen shareholders, each equally involved financially, under the general direction of their own elected President. From their own resources they would operate immediately two large local outrigger canoes and by employing a further 4/5 Wallisian fishermen prepare and instruct crews to take over improved types of powered fishing canoes during the initial 6 month period. All sales of fish would be recorded in this primary phase to determine the viability of the project, and further extension and expansion would depend on early results. During the latter part of the trial period, funds may be made available from the FIDES account for the local construction of two Cook Island type Fishing Canoes, the plans of which will be supplied by the SPC. Such a project would, if successful, eventually manage up to 10 canoes and employ up to 20 local Wallisians, catching fish outside the lagoon by trolling and handlining methods initially. At a later stage, a larger boat of suitable design for offshore fishing may be introduced to the Society. Each new stage will depend upon the consolidation and success of the previous phase and the active encouragement and support of such technical assistance which can be made available through the Administration and other agencies.

It is recommended, however, that a programme of experimental fishing sponsored by the Administration be carried out by an expert fisherman using a seagoing fishing launch and a variety of fishing equipment, the successful results of which would be passed on to the Society. During such a programme local fishermen would be trained in the use of the larger vessel with the ultimate object of operation by the Society. In establishing such a fisheries service continuity of advice and assistance would be ensured, and logistical support also provided, for the additional assistance which may be made available through other fisheries experts and technicians assigned to the area as a result of requests to the South Pacific Fisheries Development Agency. Details of the requirements for such a fisheries service are provided at Appendix No. 5.

On a long-term basis the Wallis Island Fisherman's Society would, with the assistance of technical expertise supplied by SPIFDA, expand its interests into the following fields of production:

- (1) Cultivation of mother-of-pearl shell for export.
- (2) Cultivation of Edible Oysters in selected areas.
- (3) Revive the once-practised mother-of-pearl shell lure technique for the capture of small tuna.
- (4) Shark fishing with bottom set longlines on the shallow sloping lee side of the surrounding reef and with nets inside the lagoon, for the production of shark meat, and shark fin for export.
- (5) The cultivation and management of mullet and milk fish within selected areas of the lagoon.
- (6) The development of bait fisheries to support tuna long-line operations within a five mile radius of the main island.

The success of the Society will to a large extent depend on the willingness to work of the members and employees, but the purchasing power of a large part of the 5,000 strong fish-hungry population of Wallis, to a greater or lesser extent supported financially by remittances received from their relatives amongst the 6,000 Wallisiens and Futunians employed in New Caledonia, will surely provide a regular cash market for all fresh fish and shark meat landed as a change from the monotonous diet of imported canned pilchards, and corned beef, purchased daily from local stores, and supplemented at irregular intervals by limited supplies of locally produced beef and pork, usually available for festive purposes only.

During the early stages of the development of this Fishermen's Society it may be considered advisable for the Administration to sponsor a study visit of one month, for one of the Society's members, to the Fishermen's Cooperative Society at Noumea, where he would directly participate in the routine day-to-day fishing, fish transportation, marketing and managerial aspects of this thriving organization, and subsequently be in a position to give his own Society in Wallis the benefit of his experience.

ANNEX 4PROPOSALS FOR A FISHERIES SERVICE AND PROGRAMME

As discussed elsewhere in this report, Wallis Island Fisheries are in a state of serious decline and the fish protein needs of the population are not being met. To step up local fish production and encourage the revival of local fisheries, particularly beyond the reef, will require a full-time planned programme over an initial period of three years. The Director of Agriculture in post at Wallis Island, cannot, with his many commitments in other forms of primary production, be expected to devote the amount of time required to carry out a fully rounded fisheries programme. There are no local officers available, and consequently it is necessary to seek assistance from outside. Since Wallis and Futuna is a French Overseas Territory it would be most desirable to have a French Fisheries Expert, or an Expert Fisherman recruited to take charge of a local fisheries programme. It is considered that such an officer may be recruited from a Tuna fishing port on the French Atlantic coast through the large Fisheries Cooperative Society known as Pêcheurs de France, possibly at St. Jean de Luz. With a technical fishing background of tuna trolling and pole-and-live bait fishing for tuna in the Atlantic, and almost certainly a working knowledge of long-line fisheries and net fishing, this officer would have had experience in small to medium sized fishing vessels with modern marine diesel engines. Additionally he would have, through association with Pêcheurs de France a good working knowledge of Cooperative Society procedure, which would be of value to the proposed Wallis Island Fishermen's Society. Being a French National the language question should provide no problems. During his journey to Wallis Island, it would be advisable for the officer to spend 8/10 days at Papeete, Tahiti, on board the local bonito fishing boats operating out of that port, to become familiar with the mother-of-pearl shell lure technique. It may not be possible to obtain a suitable boat for a vigorous offshore fishing programme during the first year of the 3-year project, and initially the expert could adapt part of his programme using the fishing launch "Combessa", fitted with a replacement 30 h.p. diesel engine, should this be considered desirable. He should also have at his disposal a Cook Island type canoe, for experimental fishing at this stage, and gradually build up a variety of fishing equipment for local trial. The Wallis Island Fishermen's Society would be in operation before the officer's arrival, and he should be closely associated with this group in an advisory capacity, in order to assist in the improvement of their fishing techniques; the introduction of a flake ice supply, the use of ice boxes and the cleaning of fish at sea; and the use of a simple cement silo to store flake ice ashore. He could also establish through a Revolving Loan Fund,

a supply of improved fishing gear for local supply. In cooperation with the carpenter's shop at Mata Utu he could supervise the construction of more Cook Island Canoes as required. With the help of technical experts visiting the Island from the South Pacific Islands Fisheries Development Agency, he could carry out the preliminary work required for mother-of-pearl culture experiments, the introduction of edible oysters, a survey of marine turtle resources and initiate a small turtle management project. A bait fish survey would be valuable at this stage. Having acquired a good working knowledge of the area in his first year, the second phase would entail the use of a 30'/35' seagoing fishing boat for a vigorous offshore programme designed to include multiple trolling, small scale tuna longlining, possibly pole-and-live bait fishing for tuna, and certainly the M.O.P. shell lure technique. The use of fish traps on the gentle sloping lee side of the reef would require investigation; deep handlining methods may prove profitable; the use of box nets for pelagic fishes entering the reef passes would also bear investigation. Longline fishing for shark, and the use of large mesh nylon nets, would produce shark meat and liver for local consumption, and finally fin for export.

A serious and technically qualified man with a good boat and a fair selection of gear would find himself fully occupied, and would have the satisfaction of training Wallisian fishermen in the use of improved methods. The ultimate object would be, towards the end of the project, to hand over the larger fishing boat to the Wallis Island Fishermen's Society to be operated and managed by their own trained crew. Honey realised from sale of fresh fish landed at Mata Utu would be carefully accounted and either released to the project for purchase of fuel, gear etc.; or directed to General Revenue. By keeping a detailed fishing log of methods used, fish landings, weather, temperatures and thermoclines, seasonal variations, and movement of fish would all provide valuable data for further extension and development. Such a programme would assess the value of local resources, the best means of catching fish in season, and by active encouragement of, and assistance to the Wallisian Fishermen's Society, determine finally the feasibility of reviving Wallis Island Fisheries on a viable cash market basis, and meet in increasing stages the needs of the fish hungry population.

From time to time the Administration of Wallis and Futuna may consider it of value for the SPC Fisheries Officer to visit and consult with the Fisheries expert, to review progress, and perhaps suggest any desirable revision in the programme, and this service may be made available, on request.

A list of proposed requirements for a Wallis Island Fisheries Service is given in Annex No. 5. The costing of the various headings, salaries, passages, housing, allowances and other items which are subject to local conditions is not within the terms of reference of this report, and would best be calculated, if required in consultation with the SPC Fisheries Officer, at a later date, should action be desired to effect the recommendations of this report. Such cooperation would be willingly given if requested.

ANNEX 5WALLIS ISLAND FISHERIES SERVICE - PROPOSED REQUIREMENTS *

TEM	No.	Description	1st yr	2nd yr	3rd yr
		<u>HEAD A - PERSONNEL</u>			
1	1	Expert Fisherman <u>[France]</u> <u>[3-yr contract]</u>	*	*	*
2	2	Crew <u>[Wallis]</u>	*	*	-
3	1	Tuna Specialist <u>[secondment/Tahiti]</u>	* 6m.	-	-
4		Housing, passages, special allowances	*	*	*
		<u>HEAD B - CURRENT EXPENDITURE</u>			
5		Maintenance and operation vessels	*	*	-
6		Maintenance and operation vehicle	*	*	*
7		Replacement of Experimental Fishing Gear	*	*	-
8		Office and General (Publications, Stationary, Miscellaneous)	*	*	*
9		Maintenance and operation flake ice unit	*	*	-
		<u>HEAD C - SPECIAL EXPENDITURE</u>			
10+	1	Motor Launch <u>[Wallis]</u>	*	-	-
11	1	Replacement Engine <u>[Fiji]</u> <u>[France?]</u>	*	-	-
12		Navigational aids; echo sounder; thermistor thermometer; radio, etc.	*	-	-
13	1	Cook Island type canoe <u>[Wallis]</u>	*	-	-
14	1	Outboard Engine <u>[Fiji]</u>	*	-	-
15		Purchase of fishing gear	*	*	
16	1	Vehicle and trailer	*	-	-
17	1	Flake ice machine	*	-	-
18		Purchase of ice boxes and silo	*	*	-
19		Construction of store and office			
20+	1	Seagoing fishing boat, <u>alternative</u> to Item 10, motor launch and Item 11, replacement engine.	*	maybe	
		<u>HEAD D - MISCELLANEOUS RESERVE ACCOUNT</u>			
21		Revolving loan fund (W.I.F.S.)	*		
22		Inter-Territorial Study Visits	*		
23		Mother-of-Pearl culture experiments		*	*
24		Edible oyster culture experiments		*	*
25		Provisional contribution towards local percentage costs of technical experts visiting Wallis.	*	*	*

/ Wallis Islands Fishermen's Society

ANNEX 6TECHNICAL ASSISTANCE FROM INTERNATIONAL AGENCIES

The Third Fisheries Technical Meeting at SPC Headquarters, Noumea, June 1968, recommended the establishment of a South Pacific Islands Fisheries Development Agency in order to undertake, with the assistance of international expertise, a number of feasibility and development projects of practical value to the Island Territories in the SPC Region. This recommendation was further supported by a high level meeting of fisheries consultants in Honolulu in August 1968, and the Eighth South Pacific Conference at Noumea in October 1968 subsequently recommended that an application be made to UNDP(SF) for assistance to establish such an Agency. UNDP(SF) gave its approval in January 1969 and the Plan of Operation for the Agency now (August 1969) awaits final signature by the participating Metropolitan Governments. Requests are currently being received by the Project Manager (Designate) of the Agency, at SPIFDA Headquarters; c/o SPC Headquarters, Noumea, from Territories interested in local fisheries development and extension projects to be carried out in various fields.

The Administration of Wallis and Futuna Islands may wish, at this time, to make formal application to the Project Manager of SPIFDA for assistance under the following headings, which have been discussed with the SPC Fisheries Officer during his recent visit to Wallis Island:

- (1) Assessment of development potential of coastal and lagoon fisheries resources, including bait fishes.
- (2) Trials of improved methods in mother-of-pearl and pearl production.
- (3) Feasibility study on the cultivation of edible oysters in selected areas.
- (4) Investigations into the feasibility of diversified aquaculture.
- (5) Demonstration of, and instruction in, scad mackerel fishing methods to groups of island fishermen.
- (6) Demonstration of Tahitian mother-of-pearl shell lure technique.
- (7) Survey of Marine Turtle Resources.

It should be emphasised that the establishment of a local fisheries service at Wallis Island would provide the logistical support required if maximum benefit is to be derived from the services of experts assigned to the area on any of the above projects. Without such a local structure, and the provision of counterpart staff to work with, and be trained by visiting experts, it is unlikely that any benefits would accrue which might advance the development of fisheries in the area.

SUITABLE TYPES OF FISHING CRAFTA. LAGOON AND CLOSE TO REEF

The Wallisian outrigger canoe is of very heavy construction utilising a cut out log as a base and heavy rough planks for the sides. The outrigger is also large and clumsy and is fixed to the main hull with thick poles. The fishermen claim that these boats require considerable effort to operate, and they are reluctant to take them through the reef passes onto the open ocean.

The type of canoe used in the Cook Islands, and to a certain extent in Western Samoa would be an improvement in many respects. Being simpler to construct, and made from lighter materials they are not only seaworthy but more easily manoeuvrable. The main hull of this type of canoe, built from marine plywood or light planks on sawn frames requires less time and effort to construct, and the outrigger float, being of hollow construction gives greater buoyancy. Such canoes could be built without difficulty by the present carpenter at Mata-Utu, M. Jean-Yves Aprion. Plans for the construction of this type of fishing canoe may be made available through SPC.

A modification of the improved canoe hull could be applied to the construction of a twin hull catamaran, 24 feet long, with a working platform 8 or 9 feet wide, and 10 feet long. The catamaran would be very useful for shark longline and bottom set shark net operations within the lagoon. An 8-10 horse power outboard engine would give these craft ample speed and manoeuvrability, particularly if fitted with a clutch. Such a boat would also provide a suitable diving platform for a mother-of-pearl cultivation project.

B. OUTSIDE THE REEF

To carry out a vigorous fishing programme on the open ocean within a limited distance from the reef a seagoing fishing launch will be required. This should be between 30 and 35 feet in length, 10/12 feet beam, of good round bilge and full lines, with either a rounded stern or a wide transom. The vessel may have a short fore-deck, with storage space beneath, an open wide-floored working space with a line-hauler forward at the starboard side, and a combined steering shelter and engine housing just aft of the working area. The stern section should also have a spacious fishing cockpit. This boat equipped with a 60/70 horse power marine diesel engine would have ample reserve power and should attain a speed of 8/9 knots. It is also recommended that an adequate suit of sails be supplied to the vessel, and a ship-to-shore radio tuned to Police and Post Office frequencies, would be an added safety factor. A recording

echo sounder, with a range of up to 150 fathoms would be an advantage in deep handlining operations on the sloping seaward face of the encircling reef, and for general survey work within the lagoon area.

This type of vessel would be quite satisfactory for small scale tuna longline operations, multiple trolling, pole-and-lure tuna fishing, the operation of shark longlines and shark nets, deep handlining and trap fishing.

To purchase this type of vessel overseas would entail heavy shipping and freight charges, and to construct the vessel locally of imported timber would require expensive additional wood working machinery. These factors should be carefully balanced against the possibility of constructing the hull in the ferro-cement medium, which requires the use of tools and equipment already on the island, and the importation of materials requiring a minimum of handling and stowage, e.g. rolls of wire, mesh netting, rod iron, water piping, and sand. The coral sand available at Mata-Utu is not of the best quality required for ferro-cement construction, and sharp silica sand may be obtainable in New Caledonia, Fiji or New Hebrides, all points of call for the Motor Vessel "MOANA" on her regular schedule.

Plans of the Noumea Fishing Cutter, suitably adapted for ferro-cement construction are expected to be completed shortly and will be available from SPC Headquarters. Plans of other vessels are available from the Fishing Boat Section of the Food and Agriculture Organization in Rome.

Two companies in New Zealand are now producing vessels in the 30-36' range, the former using fibre-glass hulls, the latter, ferro-cement hulls, and information on the general arrangements of these vessels may be obtained through SPC.

Should a fisheries development project be agreed for Wallis Island, it would be advisable for the Expert Fishermen to consult with the SPC Fisheries Officer for further information, which may help him to decide upon the vessel most suitable for the project.

ANNEX 8FRESHWATER FISHERIES

Crater Lake Lalolalo is about 450 yards in diameter, some 40 fathoms deep, and surrounded by steep craggy cliffs up to 100 feet high. A very steep path may be negotiated with caution down to the level of the lake, on the south east edge.

With an air temperature of 88°F, the water temperature was 82°F, Salinity 0°, and the P.H. Factor between 6 and 7. The water had a light greenish tinge and the edges of the crater were thickly covered with vegetation near the surface of the lake. White terns, Longtail terns, and White Cap Noddy terns were fairly plentiful and appeared to be nesting in holes on the steep cliffs.

Tilapia were introduced into this lake three years ago, and now are 8/9" long, and schooling. They can be seen frequently breaking the surface. Eels also occur in fair numbers, and there is a Wallisian Legend of a Giant Eel. (Shades of Loch Ness!)

Crater Lake Lanutavake about 300 yards in diameter is easily accessible by a fairly good path to the water's edge on the south west side. Rich vegetation covers all the steeply sloping sides. The lake is reputed to be 25 fathoms deep. With an air temperature of 89°F, the water temperature was 83°F, salinity 0°, and the P.H. factor between 6 and 7. Tilapia introduced three years ago appear to be thriving.

The possibility of introducing Black Bass into both these lakes has been discussed, both as food, and also as a game fish. It should be noted that these fish are very voracious and carnivorous, and that they would almost certainly thin out the stock of Tilapia. This however may not be unwelcome since the Wallisians do not find Tilapia to their taste; they prefer sea water fish when available.

Large Freshwater crayfish (*Cherax preissi*) may at some future date be considered for importation and introduction into these lakes, and although these animals can reach a weight of 4/5 lbs each, there would be the problem of catching them in these deep lakes. Black Bass, if introduced into the same water may also quite eagerly feed on the younger animals.

Other bodies of water seen were shallow, hot, and of variable level, and are not considered suitable for the introduction of Tilapia.

FISHERIES CONSERVATION

Stocks of fish within the lagoon are subjected to constant pressure from human and other natural enemies, and it would appear that not only are catch rates per fisherman decreasing, but also the size of the individual species.

The indiscriminate and uncontrolled use of long, small mesh nets, not infrequently combined with the use of fish stupifying agents, made from plant roots, to surround patches of coral has had the cumulative effect of killing large quantities of small fishes. The prohibition of these small mesh nets, except for certain purposes e.g. bait fishing, should be enforced and larger meshed nets introduced under specified regulations. The use of stupifying agents should be entirely eliminated.

Local submarine spear fishermen state that within the past five to eight years, the number of large rock cods, parrot fishes, and Napoleon wrasse have fallen off considerably. They readily admit that this is due to the increasing number of spear guns being sold, and also to the very undesirable practice of spear fishing underwater, at night, using waterproof spot beam electric torches. These torches have the effect of blinding the fish and making them easy prey to the spear fishermen. This practice should be stopped, the number of spear guns limited, and possibly licensed on an annual basis.

The lagoon would also appear to have a population of sharks, and these too will take a fair toll of the fishes living in that area. The use of bottom set shark lines in areas with coral patches, and in the fish passes within the lagoon, and also large mesh nylon shark nets set on areas of clean bottom would reduce this natural predator. Since shark meat is acceptable to the local population, and shark fin can be prepared for export, this could be a profitable operation.

Consideration may also be given to the introduction of size limits for sedentary fishes which inhabit the reef environment, since the indiscriminate fishing of the younger stages of valuable food fishes will continue to reduce the stocks available for the future, and in this respect some initial work could possibly be effected through ORSTOM.

To make regulations effective, control is required. It will not be possible to employ fisheries staff for this purpose alone, but there are police agents in the island, and local responsible village leaders could be appointed as honorary fish wardens with the authority to report cases to the Director of Agriculture for prosecution.

APPENDIX 1

TROLLING OUTSIDE THE REEF AT WALLIS ISLAND
1968

Days fishing	= 13 (at weekends)
No. of fish taken	= 146
Total weight	= 736 kilos
Average weight	= 5 kilos
Individual weights	= 1 shark 80 kilos
	1 shark 50 kilos
	1 Spanish mackerel 22 kilos
	1 Barracuda 17 kilos
	1 Horse mackerel 13 kilos
	2 Horse mackerels 10 kilos each
	29 Barracuda 8.5 kilos each.

Mean average catch/day/8-10 hours/3 lines = 56 kilos

Expenses launch "COMBESSA" @ 35 litres petrol/trip = 500 CFP

Cash value of fish/per average trip = (56x40) = 2,240 CFP

MATA-UTU 25-11-68.

B. Pasquelin

Observations

Best fishing months - Oct. Nov. Dec.

Best time of month = last quarter of moon.

Optimum sea conditions = choppy - force 3/4 Beaufort.

Lures = chum spoons. Blue mullet spoons, no. 7.

Best areas = North - N/E - E - S/E

Few fish taken away from reef.

Lagoon trolling poor.

Two Tangons/2 hand gurdies/200 B/S Monofil blue.

Speed 4/5 knots.

<u>July 1969</u>	1 Dogtooth tuna	= 48 kilos
	1 Wahu	= 26 ¹ / ₂ kilos
<u>June 1969</u>	1 Yellowfin tuna	= 8 kilos.

REFERENCE LIST OF RECOMMENDATIONS

Establish a Fisherman's Society initially to catch more fish for local sale, and also to train more fishermen to expand production.

Construct and demonstrate Cook Island type canoe and make funds available for further units on loan basis as required.

Make Phleuger record trolling lures, blue mullet, size seven, locally available for sale to fishermen.

Import an initial supply of standard blue nylon shark nets for local demonstration and sale to fishermen.

Arrange study visits of one fishermen's society member to the Fishermen's Co-operative Society at Noumea.

Arrange short survey visit of ORSTOM research vessel 'CORIOLIS' for near water thermocline investigation and tuna longline operations.

Investigate the possibility of constructing a sea-going fishing launch at Mata-Utu using the Ferro-Cement medium.

Consider the selection of Wallisian candidates for fisheries technical and administrative training at Noumea (SPC/ORSTOM/SPIFDA/Fishermen's Cooperative) for a six-month period to prepare a local counterpart fisheries assistant for attachment to the Fisheries Development Project proposed.

Obtain the temporary services of an expert in Mother-of-Pearl shell lure technique for small tunas, from Tahiti.

Recruit a French expert Fisherman to initiate a three year experimental fishing programme, and fisheries services at Wallis.

Submit request for technical assistance to the South Pacific Islands Fisheries Development Agency as detailed in Annex No. 6.

Establish legislation to eradicate prohibitive fishing practices, impose effective measurement for nets, and limit number of underwater spear fishermen, in order to introduce balanced conservation and management of lagoon resources.

Appoint honorary fish wardens to report undesirable fishing practices and other contraventions of fisheries legislation.

Encourage the wider use of outboard engines and establish a stock of spares locally.

Arrange for a survey visit by a fisheries biologist from ORSTOM to initiate fish population studies in the lagoon, and further advise on conservation and fisheries management regulations and requirements.

APPENDIX IIFISHING PLAN

"COMBESSA"

Sept-Dec. 1969.

2 days/week, excluding Saturdays.

1. Continue trolling of shark bait and handline bait.
2. Set sharklines. Compare moon and no moon.
3. Deep handlining to 150 using reels, lee side W. Reef.
4. Sharklines with lift floats sloping lee reef.
5. Lamp fishing: Kerosene, and electric, and colours -
Observe, and preserve bait fishes.
6. Build fish weir west coast and record catches (livebait?)
7. Obtain Akule and Opelu and data on occurrence.
8. Set box (Keddle) net below weir.
9. Construct 6' x 6' rafts, and troll.
10. Collect data on spear fishermen.

* * * * *

PROGRAMME DE TRAVAIL DU "COMBESSA" d'Août à Novembre 1969
 (à raison de deux jours par semaine en plus du samedi)

1. Continuer la pêche à la traine pour obtention d'appâts destinés aux lignes à requins et aux lignes à main.
2. Pose de lignes à requins à l'intérieur des passes; comparer les captures entre les nuits avec lune et sans lune; noter variétés et poids.
3. Lignes à main jusqu'à 300 m de profondeur sur la côte ouest.
4. Lignes à requins sur le tombant du récif extérieur vers 20 m de profondeur, avec petits flotteurs intermédiaires.
5. Pêche de nuit à l'extérieur au carrelet, cote ouest, extérieur:
 - a) lampe à gaz en surface
 - b) ampoule immergée vers 5 - 10 m
 - c) phare vertical avec écrans de couleurs (rouge, rose, bleu)

Observer le sens de rotation des poissons, collecter et mettre au formol les spécimens de plus de 10 cm (poissons d'appât).

6. Construire un piège à poissons face à Utuleve et enregistrer les captures. Placer un second piège (filet flottant) à la suite du premier.

7. Chercher des spécimens d'"Atule" et d'"Operu", noter les dates.
 8. Construire quatre radeaux en bambous et palmes de 2 x 2 m et les ancrer:
 - face Mata Utu (1)
 - entre Fatumanini et Fugauvea, côté lagon (2)
 - -idem- côté haute mer vers profondeur 20 m (1)
 9. Collecter des renseignements concernant la pêche sous-marine:
 - nombre de fusils
 - nombre de captures par sortie et no. d'heures
 - fréquence des sorties (wallisiens et européens)
 - combien de pêcheurs de nuit?
 - combien de pêcheurs de jour?
 - noms des espèces capturées et tailles.
-