

NOTES ON PROBLEMS ENCOUNTERED IN AN ATTEMPT TO DEVELOP

A CANOE FISHERY AT FUNAFUTI ATOLL

By Sam Rowlands,
Fisheries Development Officer, Funafuti

Introductory.

1. This paper is not an eulogy, neither is it an account of success nor of failure, it is however concerned with the ideas, efforts, plans and objectives for establishing a viable fishery.

2. The background.

The aftermath of the disturbed weather conditions which culminated on the night of October 21st./22nd. (1972) was marked by the near totality of destruction to standing land-crops. Relief supplies arrived with creditable rapidity & a period of rationing commenced. It was patently obvious that the community should provide for itself wherever possible & equally obvious that this should be obtained from marine resources.

2.1. Replacement of lost fishing craft & equipment.

To all intents and purposes, the traditional requisites vanished overnight: gear had been ripped, shredded or swept away whilst frail canoes had been crushed or pulverised during the wind-whirling violence. Few assets remained, little but the essential endemic skills. Nethertheless the gap was closed by the generosity of several agencies & within two weeks the following equipment was available & ready for use.

- i. Five outboard engines.
- ii. Three fibre-glass skiffs.
- iii. An embryo fleet of locally donated 4 & 5 men canoes.
- iv. A substantial supply of monofilament drive-nets, fishing lines, hooks, swivels & other accessories.

3. Immediate utilisation of new craft & gear.

The target for production was clear, to provide sufficient fish for about 700 people daily. The newly acquired equipment could have been distributed to individuals & the Fisheries Survey Unit could have undertaken the task using their outboards & skiffs. However it was decided that whilst the Survey Unit should control & manage the programme, the community as a whole should be involved. Consequently a pattern gradually emerged, which by the end of 1972 was in effect a fishermen's society supported by the Fisheries Survey Unit. At this time, a degree of normality had returned & the economy was reverting to its former quality, the principle ingredients being wage-earning &

the inflow of remittances from overseas. Nevertheless, studies by appropriate authorities revealed a substantial segment of the population which lacked adequate means of support & consequently the Red Cross undertook this responsibility, and in so doing contracted with the fishermen's organisation for 600 lbs. of fresh fish weekly. At about this time, a relief team arrived & the hotel was fully occupied which again added to the demand.

Production of fresh fish.

At first the fishermen's society were hard pressed to meet an apparently growing demand but by the end of March the daily landings of fish had outstripped local market requirements & several hundred-weights were salt-cured & dried. In the meanwhile, most of the donated canoes had been handed over for private use by individuals leaving four for the society. Most of the fish caught was either lined at night in the vicinity of reef passages or netted in the shallows during the day, with each of the four canoe crews landing $\frac{1}{4}$ of a ton each week. (The Survey Unit provided a powered skiff to tow the canoes to & from each operation, a daily distance of about 20 miles). The performance of the canoes demonstrated the relatively high production capacity of a craft costing less than Aus.\$100, and indicated that with the addition of outboard engines and more efficient gear an even greater volume could be achieved.

4.1.

A decline in production.

The decline was more rapid than the rise. It was attributed to the several factors listed below, and each of these are discussed in later paragraphs concerning the implementation of the Aus.\$80,000 local fisheries development project (G.E.I.C. Project 108: Funafuti Fisheries Development Complex: approved with effect from April 1st, 1973).

- i. Local market demand.
- ii. Lack of known export markets for dried salt-cured fish.
- iii. Absence of refrigeration facilities.
- iv. The requirement for canoe power-units & specialised fishing gear.
- v. A need for selective fishing, particularly for the domestic market.
- vi. A requirement for continued support by the Fisheries Survey Unit particularly in fields of production, processing & marketing high-volume crops but necessarily including the lesser secondary fisheries, such as beshe de mer, which are often low-volume but higher priced.
- vii. Structure of the fishermen's society.

5. The Funafuti Fisheries Development Project.

The official preamble suffices to describe the scheme." --- preliminary results are encouraging and it is now proposed that existing makeshift arrangements be replaced by a phased demonstrational programme, involving mechanisation of canoes, introduction of improved gear and provision of processing facilities. The Fisheries Survey Unit has, at present, the use of three skiffs which will be used for production-demonstrations. The project aims at establishing a fisheries base from which a commercial fishery will be developed to cater for the domestic demand and to provide suitably processed fish for export. The first stage * of this project lays emphasis on training through the introduction & demonstration of improved fishing gear, mechanisation of canoes & appropriate processing facilities. The objective is to upgrade an unorganised subsistence fishery to an organised commercial enterprise. The second* stage will include the introduction of improved craft, possibly modified canoes, to raise primary productivity. The complex's social benefits include prospects of better living for the community, through the provision of employment-opportunity & by earning foreign exchange."

Notes:-

*. This project is the 1st phase of the local fisheries development complex. The 2nd. stage will be planned, & applications for funding will follow, when sufficient data & experience has been accumulated from this initial phase. The funding of this project, provided by the United Kingdom, amounts to Aus.\$80,000.

6. Implementation of fisheries development project.

Endemic South Pacific problems, centred around communications, normally generates substantial delays between project-approval and completion of project-construction. In this case, the pattern follows the norm. However, in brief, a reasonably suitable site has been acquired, cleared & prepared for building development. Plans are on the drawing board in respect to some facets, and actual construction has commenced on stores & an all important canoe shelter (the Ellice canoe deteriorates rapidly if not kept under shade.). Equipment has been ordered. It is anticipated that completion, in respect to acquisition of equipment and construction of buildings and slipway, is unlikely until November. A further period of "make-shift" operations is therefore inevitable, but the end is in sight.

6.1. Relationship between the project & fishermen's society.

In general terms, this has already been covered in section 5. In the

sense of practical application, it is difficult to make a precise statement at this stage as there are several unresolved problems related to establishing an appropriate processing plant. However discounting that issue for the time being, it is planned to loan the society 3 x 5.h.p. Seagull outboards and one glass-fibre skiff with a 20 h.p. Johnson. The 4th society-canoe will not be powered as yet & will be expected to operate as a beche de mer collector: the crews will rotate accordingly. The Fisheries Survey Unit will operate its own canoes, for the next few months: they will undertake two surveys, the first will be an extension of the vertical long lining investigation commenced in 1972 & relinquished on losing the Survey vessel on Oct. 21st/22nd (A working paper on this subject was prepared for the 5th Technical Meeting) & the second will study flying-fish netting techniques in view of local long-lining potential*. The reason why the Survey Unit is encouraging a local interest in beche de mer is not because the decimated-resource is likely to render substantial profits** but because this type of fishery requires a discipline by its participants, not so much on the production side but rather in respect to the complex & prolonged three-phased processing. Experience has shown that subsistence fishermen are total strangers to essential self-discipline & it is believed that this must be instilled as a prerequisite to involvement in any successful commercial enterprise.

Notes:

- *. The Fisheries Survey Unit proposes to plan an investigation into the potentials of establishing a flying-fish operation either as a possible export commodity or as an adjunct to a locally based long-lining enterprise. Practical planning will depend on the outcome of preliminary enquiries on marketing & local assessment of production potential.
- ** The Fisheries Survey Unit has studied beche de mer production as a secondary or 'stop-gap' fishery. Suitable processing techniques have been developed & necessary training given to local fishermen. The resource was severely damaged by the turbulent seas of October and whilst this will be replaced by the present supra-abundant juveniles, catch-rates of mature specimens will remain low for a long time. Survey Unit canoe-crews can collect from forty to eighty a day, the equivalent of 10 to 20 lbs processed worth Fijian \$6/00 to \$12/00.

7. An assessment of the principle problems impeding progress by the society.
 This has been touched upon in sub-section 4.1. & elsewhere on previous pages. The intention of the Fisheries Survey Unit is to identify areas of technical difficulties and to attempt to resolve the component problems under the aegis of the development project. It must be stressed however, that an element of obstacles hindering progress lies beyond the competency of the Unit.

7.1. Structure of the society & questions of reorganisation.

In the opinion of the writer the society should be reorganised as an association of primary producers. In recent discussions with their committee members the impression has been gained that whilst some support this contention the majority do not.

- i. Membership. There are approximately 200 members, residents with few exceptions, representing all age groups. Cost of joining was Aus.\$0/50 & this contributed to the original enthusiasm to unite, but the underlying factor was more probably a premature anticipation of an annual bonus-payment.
- ii. Management. There are 7 committee members headed by a Chairman and day to day activities are guided by a paid Manager (Aus.\$29/00 per month) and secretary.
- iii. Fishermen. The four canoes are crewed by four men to each craft. Their emolument is based on a locally devised incentive system which falls short of being satisfactory. Each crew has to land a fortnightly quota which is valued at the current retail selling price: half of this is paid to the producers & the other half credited to the society. When the quota is reached before the two-week period has elapsed, further landings are credited directly to the fishermen only.

The flaws are clear & presage uncertainty about the ability of this society in its present form to evolve into a successful commercial enterprise. Denigration will achieve nothing, neither will rigid adhesion to dogma and it may be prudent to exercise restraint at this stage by avoiding direct criticism and allowing opportunity for any changes to unfold from within.

7.2. Production & market outlets.

7.2.1. The domestic market, its dimensions & preferences.

Whilst there is no precise data, per capita consumption of marine produce is unusually high compared to that recorded for developed territories: it would not be unreasonable to suggest that the majority of family units have fresh fish, salt fish or other marine foods at least once daily. The exceptions would include the higher wage bracket group who have acquired a taste for canned meat & other store-goods. Experience has shown that those with average cash-resources have pronounced preferences and it is believed that this group would increase their average fresh & salt fish consumption by two-fold if the available fish was a popular variety, particularly tunas & castor oil fish & despite the fact that these are substantially more expensive than other equally "palatable" species. Therefore it is necessary for the fishermen's society to provide for this taste and its demand, thereby producing more, selling more & earning more.

7.2.2. The domestic market: retail prices.

Price figures in <u>Australian cts</u> Dates	Castor-oil fish, tunas & wahoo. per lb.	All other fresh fish. per lb.	Small salt fish per piece.	Large salt fish per piece	Lambis and Clam per shell
Jan to June.	20	10	2½	20	5
June onwards	25	15	3	25	5

Increase followed upsurge in petrol price from 76 cts to \$1/01

7.2.3. Product storage; refrigeration.

In the past, as at present, the absence of 24-hour electric power precluded refrigeration: it is understood that plans have been approved & that the island should enjoy power facilities by the end of this year. This development will make it possible for limited fresh fish storage either at a designated market or retail shop. However the major problem of being able to utilise large catches, surplus to local demands, will remain problematical. As yet no positive decisions have been possible in respect to establishing freezing & cold-storage installations because of uncertainty about the form of fishery likely to be developed. The foot-note following sub-section 6.1. refers to tentative plans to investigate flying-fish resources (& other potential long-line bait fish) & if preliminary marketing enquiries & experiential fishing are promising

the Fisheries Survey Unit would initiate planning a pilot-project including all necessary refrigeration units.

7.2.3.1. Product storage: other methods.

The climatological conditions (high humidity & annual precipitation of about 3,5000 mm) prejudice any prospects of holding "dried" fish for any length of time without complex storage facilities. Well cured samples may be kept from one to two months whereas traditionally processed fish deteriorates in a considerably shorter period. Nevertheless present intentions are not to dismiss the subject but to continue investigations with a lower degree of priority.

There are unpredictable periods of bad weather which prevent normal fishing operations and the daily needs of the local market. This occasional but recurrent shortage can be partially alleviated by maintaining captive-stocks of suitable species in floating ponds. Investigations have demonstrated that Rock Cods from 3 to 5 lbs.* can be kept without difficulty in floating enclosures 2 to 3 metres deep for periods up to 3 months. Trials with other species are planned.

*.Note:- Rock-cods refer to Ephinelphus & similar fish.

7.2.4. Export possibilities: preliminary notes.

To establish a viable commercial fishery on any small island requires an ability to produce sufficient volume of a wanted product at a cost which allows reasonable profits after covering abnormally high freight rates in addition to normally expected production charges. These are basic factors which will influence the final design of the gradually emerging canoe-fishery, it would be premature to speculate about its ultimate configuration or dimensions until development surveys are completed. Meanwhile the following notes, indicating some present concepts and limitations, are presented for general interest and in the hope of engendering constructive criticism.

7.2.4.1. Export production.

The production unit will be a motorised canoe with specialised equipment and a crew of two or three skilled fishermen. At first glance, the Ellice canoe appears fragile, an impression motivated by the light construction which is essential for facilitating over-reef launching. Canoes of the Fisheries Survey Unit & the fishermen's society are 8 to 9 metres long designed for a crew of 5. Present intentions are to mechanise the craft with Seagull outboards & the capital cost of one vessel thus equipped & including specialised gear is about \$400. At an additional cost of another Aus.\$300, 9½ h.p. Johnston engines could be

fitted. Production from one motorised canoe with a crew of 2 under average conditions is impressive, particularly when related to capital cost. Examples recorded are:-

- i. Trolling. Wahoo, runner, skipjack, & yellowfin. 150/300 lbs.
- ii. Pole & lure. Skipjack. 100/400 lbs.
- iii. Lining. Snappers, wahoo, yellowfin, 100/400 lbs.
- iv. Scoop-net. Flying-fish, 100/200 fish. Half-beaks, 200/300 fish.

Acquisition of canoes by the Fisheries Survey Unit has been too recent to obtain required catch-rate statistics & quoted catches refer to private craft on operations varying from four to a maximum of six hours.

However the overall evidence is promising & indicates that ten or more craft operating as a fleet could produce a substantial volume.

7.2.4.2. Selecting potential export fisheries.

Many factors will influence the ultimate establishment of an export fishery, not the least being distance from markets and abnormally high freight rates. The table below illustrates some possible avenues likely to be explored during the next twelve months.

EXPORT CATEGORIES AND CARRIERS

	HIGH VOLUME/LOW PRICE		LOW VOLUME/HIGH PRICE	
CHARTERED REEFER.	DIVERTED LONG LINER	COLONY SHIPPING	AIR-PACIFIC	COLONY SHIPPING
i Tunas & other frozen pelagics.	ii Frozen bait fish.	iii Linited qtys' of products shown in left hand columns.	iv Frozen table-fish fillets. v Crustacea: Panulirus sp etc. vi Aquarium fish	vii Shark fins. ix Beche de mer.

Summary.

A fishermen's society has evolved from circumstances arising in the wake of the October maelstrom, its image carved by prevailing conditions may be heretical to co-operative principle but its potential ability is beyond question provided that unhampered support and unprejudiced guidance are available to steer the enterprise through the adolescent stages of development. Problems

have arisen and have been countered, too often to be replaced by further problems and the virtues of forbearance and resolution are likely to be strained long before touching the threshold of success. The somewhat dismal inference is stressed purposely to curb any propensity to presumptuous optimism. In contrast, one must look at the other side of the coin and consider achievement. Using 4 donated canoes, initially equiped with basic gear and supported by a Fisheries Survey Unit motor-skiff the society not only met its contractual obligations but exceeded all demands with each canoe landing 2 tons of fish in the 23 fishing-days of March. That was not an optimum result, nets were remnant shreds, trolling oportunities were denied and the day to day landings were a tribute to individual efforts. The S.P.C. Fisheries Officer was stranded in Funafuti at that time & contributed appreciated advice: he observed and commented upon a factor of significant importance which we had taken for granted, quite simply, the efforts discussed in this paper have achieved a sufficiency of landed sea-foods for the community, a measure of success not attained by many neighbouring territories.