

GRANT PROJECT AGREEMENT

Between the United States of America, acting through the Agency for International Development (AID),

AND

The Government of Papua New Guinea Grantee

1. Project Title: Oro Bay Canoe Development 2. AID Project Number: 879-0009.89.2

The above-named parties hereby mutually agree to carry out the Project described in this Agreement in accordance with (1) the terms of this Agreement, including any annexes attached hereto, and (2) any general agreement between the two governments regarding economic or technical cooperation.

3. Amount of AID Grant: Up to \$60,000 4. Grantee Contribution to the Project: See Annex A, 4.a. 5. Project Assistance Completion Date: December 31, 1989

6. This Agreement consists of this title page and Annex A, Project Description, including Attachments 1 (budget) and 2 (expenditure report) Annex B, PROAG Standard Provisions, and Annex C, GPNG project proposal submission

7. For the Grantee (Typed Name): GABRIEL PEPSON Signature: [Signature] Title: a/First Assistant Secretary Date: January 21, 1988. 8. For the Agency for International Development (Typed Name): William E. Paupe Signature: [Signature] Title: Regional Director South Pacific Date: September 25, 1987

Fiscal Data: (87 Manila 30718) Appropriation: 72-117/81037 Budget Plan Code: QES7-87-27879-KG13 Obligation Number: S870531

Loan and Grant Agreements
PA/IBD (if Loan)
PA/PAID
PA/POAD
GC/IBD
ANE Desk
ANE/TR Officer
ANE/PD Officer & File
PPG/CDIE/DI

209 SA-18

Annex A, Project Description

1. Project Title: Oro Bay Canoe Development Program

2. Project Number: 879-0009.89.2

3. Project Description:

One of the factors inhibiting development of small-scale, coastal fisheries in Papua New Guinea is the lack of suitable craft at reasonable prices. Preliminary appraisal has shown that two new canoe designs currently in use are worthy of further promotion. These are the "Tohana" (PNG2) and the "Red Snapper" (KIR4) canoes.

The Oro Bay Canoe Development Program (OBC) received some initial funding during 1986 from an in-country, non-governmental aid body. The local officer of this organization indicated that OBC hoped to acquire approximately US\$60,000 for funding the project during 1986-87.

Using local village labor on a self-help basis and where possible local materials (including bush materials), the OBC plans to introduce the "Tohana" design of improved dugout canoe to Oro Bay, Northern Province. The immediate objective of the project is modification of existing dugout canoes to give greater strength, improved seaworthiness, increased load-carrying capacity, greater longevity, and better performance as commercial fishing craft, at affordable prices. A second immediate objective is the training of fisheries staff and private individuals in the use of the new designs, including continued back-up support to the owners of new craft. Assistance will be given to small-scale, private builders of the new designs to encourage them to take over the construction of all future craft.

The project completion date is estimated to be February 1989. Oro Bay Fisheries staff will continue to monitor the project in a supervisory/advisory capacity until early 1991. From 1991 onwards, if the project has been successful, village canoe-building using improved methods should continue in the Northern Province without further Government subsidy. Oro Bay Fisheries would still retain the function of giving appropriate technical advice and some instruction, if and when required.

4. Special Provisions:

a. Grantee Contribution

(1) The Grantee agrees to provide or cause to be provided for the project all funds, in addition to the Grant, and other resources to carry out the project in a timely and effective manner, and to bear the recurring operational costs for

the project that follow the Project Assistance Completion Date of February 1989.

(2) The estimated Grantee contribution to the project is the use of Fisheries Division facilities and also as contained in the project description section 3. The dollar or in-kind contribution by the Fisheries Division is difficult to quantify, but will be in the order of \$4,000 per year of the project.

b. Funding

AID's contribution in support of the project will be provided in accordance with Block 3 of the Cover Page to this Grant. To facilitate project implementation and to assure availability of AID funds for this purpose, the advance payment method of financing will be used in the Project. A full advance of \$60,000.00 will be made by AID to the Grantee. Accounting for the use of these funds will be made in accordance with Annex A-2 special provision entitled "Expenditure Report." At the completion of the Grant and the Project, a certified consolidated expenditure report (A-2) will be submitted, accounting for expenditures attributable to the advance up to the completion of the Grant and Project.

c. Source, Origin, and Nationality Requirements

Commodities financed by AID under the Project shall have their source and origin in the United States, except as AID may otherwise agree to in writing, or as they are available as locally procured shelf items of a non-technical nature. Except for ocean shipping, the suppliers of commodities or services shall have the United States as their place of nationality, except as AID may otherwise agree to in writing. Ocean shipping financed by AID under the Project shall, except as AID may otherwise agree to in writing, be financed only on flag vessels of the United States.

For purposes of this paragraph, the Grantee agrees that any commodities or services associated with this Project will be supplied through a purchase agreement with a U.S. company. AID agrees that equipment of U.S. origin may be purchased in AID Geographic Code 941 countries in order to expedite its purchase and transport to Papua New Guinea, and that to the extent transportation from such Code 941 countries is not available on U.S. flag vessels, transport on flag vessels of countries in AID Geographic Code 935 may be financed under the Grant, subject to the certification requirements set forth in paragraph d. below.

d. Procurement Procedures

Grantee will use its own procurement procedures as approved by AID in the purchase of equipment and or services under the

Project, but no more than reasonable price will be paid for any goods or services financed, in whole or in part, under the Grant. Such items will be procured on a fair and, to the maximum extent practicable, on a competitive basis. In connection with these requirements, Grantee will solicit quotations from a reasonable number of sources, and shall award purchase contracts to the most advantageous offerors, price and other factors considered.

e. Marking Requirements

It is AID policy that projects and commodities financed by AID be suitably identified as supported by the U.S. Foreign Assistance Program. The Grantee will give appropriate publicity to the Grant and the Project as a program to which the United States has contributed, and mark goods financed by AID as described in Project Implementation letters.

f. Use of Funds

AID funds provided in the Grant may be used solely to pay for items of allowable cost as set forth in the project description and budget, or to reimburse the Grantee for such items.

g. Reporting

The Grantee will submit twice yearly reports including a financial summary and technical information in triplicate to USAID recording the progress made to date on the phases of this project. At the completion of this project, the Grantee will submit three copies of a completed end-of-project summary to the USAID Regional Director, American Embassy, GPO Box 218, Suva, Fiji. A final financial report will be submitted to the same addressee within 90 days of project completion.

h. Grant Budget

The budget for this Grant is contained in Annex A-1. The funds provided herein will be used to finance this project up to a total of \$60,000. It is agreed that any additional funds for this project will be provided from sources arranged by the Grantee, and that the Grantee will either obtain the non-AID amounts, or it will provide these amounts from its own resources.

ANNEX A-1

BUDGET
(in Kina \$000's)

<u>INPUTS FROM FUNDING AGENCY</u>	<u>1987 - 1988</u>
Program Staff Salaries	26.4
Training Funds	8.0
Materials Costs	13.5
Tools/Engines/Equipment	18.4
Staff Travel	4.0
Consumables	5.0
Consultancy	<u>6.0</u>
Total est. cost Kina	81.3

The US dollar equivalent to Kina costs above is approximately \$60,000.

ANNEX A-2

EXPENDITURE REPORT

Government of Papua New Guinea
Oro Bay Canoe Development Project
South Pacific Fisheries Development Project 879-0009.89:2
Date:

Expenditure Report - Advance Liquidation
(put in date of grant to end of grant - in U.S. Dollars)

<u>Elements</u>	<u>Total Expenditures</u>
Program Staff Salaries	xxxx
Training Funds	xxxx
Materials Costs	xxxx
Tools/Engines/Equipment	xxxx
Staff Travel	xxxx
Consumables	xxxx
Consultancy	xxxx
Other costs (listed)	<u>xxxx</u>
Total Expenditures \$	xxxx

I, the undersigned, hereby certify that: (1) the expenditures claimed under the cited agreement are proper and due and that appropriate refund to AID will be made promptly upon request of AID in the event of non-performance in whole or in part under the terms of the agreement or for breach of the terms of the agreement; (2) the information on the fiscal report is correct and such detailed supporting information as AID may require will be furnished at the grantee's home office, as appropriate; (3) all requirements called for by the agreement to date of this certification have been met.

By: _____

Title: _____

Date: _____

Annex B

PROJECT AGREEMENT

PROAG STANDARD PROVISIONS ANNEX

- A. Reference to 'this Agreement' means the original Project Agreement as modified by any revision which have entered into effect. Reference to 'cooperating country' means the country or territory of the Grantee.
- B. (1) AID will make available the amount specified in Block 3 of this Agreement, as necessary for the Project, as may be further described in Annex A.
- (2) The Grantee will make available the amount specified in Block 4 of this Agreement, as necessary for the Project, as may further be described in Annex A. The Grantee will also make, or arrange to have made, additional contributions of property, services, facilities and funds required for carrying out the Project as specified in Annex A.
- C. AID and the Grantee may obtain the assistance of other public and private agencies in carrying out their respective obligations under this Agreement. The two parties may agree to accept contributions of property, services, facilities and funds for purposes of this Agreement from other public and private agencies, and may agree upon the participation of any such third party in carrying out activities under this Agreement.
- D. Except as otherwise specified herein or subsequently agreed by the parties, all contributions of the parties pursuant to this Agreement shall be made on or before the Project Assistance Completion Date, or amended date. A contribution of goods or services shall be considered to have been made when the services have been performed and the goods furnished as contemplated in this Agreement. Disbursement of funds may take place after final contributions have been made, but AID shall not be required to disburse funds hereunder after the expiration of nine months following the estimated Project Assistance Completion Date (Block 5 of this Agreement) or any amended Project Assistance Completion Date specified.
- E. The procurement of commodities and services to be financed in whole or in part by AID and (where so required by AID procedures) be undertaken only pursuant to Project Implementation Orders (PIOs) issued by AID.
- F. Unless otherwise specified in the applicable PIO or Project Implementation Letter (PIL), the procurement of commodities imported specifically for the Project and financed with the AID contribution referred to in Block 3 of this Agreement shall be subject to the provisions of AID Regulation
- G. Unless otherwise agreed by the parties or otherwise specified in the applicable PIO, title to a property procured through financing by AID pursuant to Block 3 of this Agreement shall be in the Grantee, or such public or private agency as it may authorize.
- H. (1) Any property furnished to either party through financing by the other party pursuant to this Agreement shall, unless otherwise agreed by the party which financed the procurement, be used effectively for the purposes of the Project in accordance with this Agreement, and upon completion of the Project, will be used so as to further the objectives sought in carrying out the Project. Either party shall offer to return to the other, or to reimburse the other for, any property which it obtains through

financing by the other party pursuant to this Agreement which is not used in accordance with the preceding sentence.

(2) Any funds provided to either party pursuant to this Agreement which are not used in accordance with this Agreement, shall be refunded to the party providing the funds.

(3) Any interest or other earnings on funds provided by AID to the Grantee under this Agreement will be returned to AID by the Grantee.

I. (1) If AID and any public or private organization furnishing commodities through AID financing for operations hereunder in the cooperating country, is, under the laws, regulations or administrative procedures of the cooperating country, liable for customs, duties and import taxes on commodities imported into the cooperating country for purposes of carrying out this Agreement, the Grantee will pay such duties and taxes unless exemption is otherwise provided by any applicable international agreement.

(2) If any personnel (other than citizens and residents of the cooperating country), whether United States Government employees, or employees of public or private organizations under contract with, or individuals under contract with AID, the Grantee or any agency authorized by the Grantee, who are present in the cooperating country to provide services which AID has agreed to furnish or finance under this Agreement, are under the laws, regulations or administrative procedures of the cooperating country, liable for income and social security taxes with respect to income which they are obligated to pay income or social security taxes to the Government of the United States of America, for property taxes on personal property intended for their own use, or for the payment of any tariff or duty upon personal or household goods brought into the cooperating country for the personal use of themselves and members of their families (not including such personal or household goods as may be sold by any such personnel in the cooperating country) or if any firm, not normally resident in the cooperating country, is liable for income, receipts, or other taxes on work financed by AID hereunder, the grantee will pay such taxes, tariff, or duty unless exemption is otherwise provided by any applicable international agreement.

J. If funds provided by AID are introduced into the cooperating country by AID or any public or private agency for purposes of carrying out obligations of AID hereunder, the Grantee will make such arrangements as may be necessary so that such funds shall be convertible into currency of the cooperating country at the highest rate which, at the time the conversion is made, is not unlawful in the cooperating country.

K. AID shall expend funds and carry on operations pursuant to this Agreement only in accordance with the applicable laws and regulations of the United States Government.

L. The two parties shall have the right at any time to observe operations carried out under this Agreement. Either party during the term of the Project and for three years after the completion of the Project shall further have the right (1) to examine any property procured through financing by that party under this Agreement, wherever such property is located, and (2) to inspect and audit any records and accounts with respect to funds provided by, or any properties and contract services procured through financing by, that party under this Agreement, wherever such records may be located and maintained. Each party, in arranging for any disposition of any property procured through financing by the other party under this Agreement, shall assure that the rights of examination, inspection and audit described in the preceding sentence are reserved to the party which did the financing.

M. AID and the Grantee shall each furnish the other with such information as may be needed to determine the nature and scope of operations under this Agreement and to evaluate the effectiveness of such operations.

N. The present Agreement shall enter into force when signed. Either party may terminate the Agreement by giving the other party thirty (30) days written notice of intention to terminate it. Termination of this Agreement shall terminate any obligations of the two parties to make contributions pursuant to Blocks 3 and 4 of this Agreement, except for payments which they are committed to make pursuant to noncancellable commitments entered into with third parties prior to the termination of the Agreement. It is expressly understood that the obligations under paragraph H relating to the use of property or funds shall remain in force after such termination. In addition, upon such termination AID may, at AID's expense, direct that title to goods financed under the Grant be transferred to AID if the goods are from a source outside the Grantee's country, are in a deliverable state and have not been offloaded in ports of entry of the Grantee's country.

O. To assist in the implementation of the Project, AID from time to time, may issue PILs that will furnish additional information about matters stated in this Agreement. The parties may also use jointly agreed-upon PILs to confirm and record their mutual understanding on aspects of the implementation of this Agreement.

P. The Grantee agrees, upon request, to execute an assignment to AID of any cause of action which may accrue to the Grantee in connection with or arising out of the contractual performance or breach of performance by a party to a direct U.S. Dollar contract with AID financed in whole or in part out of funds granted by AID under this Agreement.

ANNEX C

THE ORO BAY CANOE DEVELOPMENT PROGRAMME

"The programme will promote the availability of improved designs of village transport and fishing craft at affordable prices, through better utilisation of local resources, modern construction techniques, timber preservation methods and appropriate training. The programme is aimed at encouraging self-sufficiency in marine produce and at generating more income earning opportunities in coastal villages".

A project proposal and request for funding assistance from any interested aid donor.

Department of Fisheries and
Marine Resources
P O Box 165
KONEDOBU
Papua New Guinea

Telephone: 214522 x 42
Telex: Fishrep PNG NE22391/
NE22392

Department of Oro
Free Mail Bag Service
POPONDETTA
Papua New Guinea

Telephone: 297345
Telex: NE29191

Date: February 1987

File: G9-4-2DC

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1. PROJECT SUMMARY

One of the constraints inhibiting the development of small-scale coastal fisheries in PNG is the non-availability of suitable craft at affordable prices. Preliminary vessel appraisal has shown that two new designs of canoes, currently in use, are worthy of further promotion. These are the "Tohana" design (PNG2) and the Red Snapper Canoe (KIR 4). Other designs also show potential.

The Oro Bay Canoe Development Programme (OBC) received some initial funding during 1986 from an in-country, non-government aid body. The PNG office of this aid body indicated that it hoped to acquire K60,000 for funding the project during 1986-87, following application by the PNG government through the appropriate channels. The PNG office was closed at short notice and funds are no longer available. Qualified staff have been allocated to the project but the assistance of another interested aid donor is now a priority.

Using local village labour on a self-help basis and, where possible, local materials (including bush materials), the OBC plans to introduce the "Tohana" design of improved dugout to Oro Bay, Northern Province. Initially 12 village groups will provide their own new dugout log, and labour, to build their new vessels. Low cost durable materials will be

purchased by OBC. Material costs will be repaid by the groups concerned, in instalments following a free three month trial period. During the trials the new craft will be powered by alternative types of engines/motors owned by the project. During the trial period the groups will be assisted to apply for a loan from the PNG Agriculture Bank to purchase their own engine of the preferred type. The groups will continue to receive technical assistance and some supervision until all outstanding loans have been repaid.

A demand is growing elsewhere in PNG for a supply of Red Snapper Canoes. These are made from planks and plywood but there is still no local supplier. OBC will respond to the demand by building a limited number, to order, at a realistic price, on a cash with order basis. The long term objective is to train and establish an appropriate number of private builders to meet future demands throughout PNG.

The services of a suitable qualified naval architect, (someone has already been identified) will be required to visit the project site. He should assess and advise on future design requirements and any modifications to existing designs which may prove necessary.

Finally OBC will be required to maintain a high standard of reporting, including the preparation of costings on each craft built. Manuals on construction techniques will be produced and published.

The expected project life span in Oro Bay is four years. The first two years will involve the full time participation of the present senior technical instructor. In the third year the instructor will leave, depending on project assessment, a less senior officer to scale down the project activities. Depending on demand, a similar project may be initiated in a different province utilising some of the OBC staff. The success of the project will be determined by whether canoes continue to be built privately when the project is finished and on the use made of canoes built by the project.

The total amount of funding for OBC sought from sources other than the PNG government is K73,800.

2. BACKGROUND AND JUSTIFICATION

2.1. The Problem

Village canoes in most areas of PNG have developed solely as subsistence craft for fishing and transport in sheltered water. Attempts have been made to use village canoes as commercial village fishing craft. In all but relatively protected waters, the

present designs of fishing canoes have mostly proved unsatisfactory as commercial fishing craft. While there are a few notable exceptions in certain localities, the main disadvantages of most canoes are:

- (i) their low stability in choppy seas;
- (ii) low load carrying capacity;
- (iii) high fuel costs when powered by outboard motors fitted with standard propellers.

Villagers and fisheries staff, in attempts to find more reliable fishing craft capable of consistent fishing in winds of 10-20 knots, have tried inboard diesel engined workboats of 7 to 10 metres in length, (locally called "dories"). These dories, although they have their merits, are now outside the financial reach of most villagers. A 7.3 plywood and plank dory is now priced at around K16,000 (Dec. '86). Added to the cost factor are the disadvantages of requiring a sheltered anchorage and specialised maintenance.

A variety of imported dinghies have also been tried and around the urban centre of Port Moresby a 5.7m (19ft) fibreglass dinghy powered by a 25hp outboard has proved popular. The combined price of the dinghy and outboard is currently around K4,900 and again, outside the reach of most rural village fishermen. Dinghies have not proved to

be very suitable except in areas where high prices are paid for the catch.

Maintenance of aluminium and fibreglass dinghies has also proved to be a problem. With regular rough use they have an expected life span of from one to three years before requiring major repair. Often damaged dinghies are not repaired because of a lack of suitable materials, equipment and/or skills. The majority of dinghies used in PNG are imported and this has clear foreign exchange and employment implications.

In their annual report for 1986, Oro Bay Fisheries Authority (OBFA) identified the lack of suitable village fishing craft as being one of the major constraints to the development of the area's abundant marine resources.

2.2. The Solution

Recognizing the above problems, a vessel appraisal programme (1984-1986) examined the feasibility of developing fishing craft especially suited to local fishing conditions. New designs of small transport and fishing craft can be made mostly from PNG resources and, to cut costs and increase employment opportunities, be built by small village boatyards. Cost-effective designs of small fishing craft have been developed which are attractive to village people and appear viable for part-time, village transport and fishing purposes.

The term village people has been used in preference to village fishermen as in most areas there are very few specialised fishermen, most do more agriculture than fishing.

There are certain clear advantages in using a long narrow craft with a stabilising outrigger, i.e. a canoe, for fishing when the rewards are low. Any craft of a given displacement (weight), will be cheaper to power, and will travel faster through the water (as a displacement vessel) if it is long and slender like a canoe, as opposed to short and broad like a dory. Not only will fuel consumption be less for a given engine but a smaller engine size can be used to achieve the same speed if the craft is longer and narrower. Traditional canoe handling skills have developed to a high standard in many areas. Good canoe builders are regarded in high esteem. People are therefore likely to adapt quickly, and with considerable interest to the familiar canoe design if made more stable and more seaworthy under load. Improved canoe designs have the additional advantages over dinghies and dories of being easily sailed, paddled and poled.

- By :
- : improving local canoe building skills,
 - : using modern canoe design techniques,
 - : using timber preservatives and durable fastenings,
 - : obtaining some materials from the bush e.g. mast, spars, outrigger beams, dugout log;
 - : keeping costs to a minimum; and
 - : making more use of village manpower

there is a good opportunity for PNG to find solutions to the problem described above in Section 2.1. While still abundant, timber resources in many areas will continue to be used for dugout hulls for some time to come. Inevitably large trees will, in many areas, become increasingly valuable and alternatives from local planks and plywood will become increasingly necessary.

3. OBJECTIVES

3.1. National

The overall objectives are: greater self-sufficiency in marine produce, an increase in income generating activities and the promotion of coastal trade, transport and communications through the improvement of small-scale village craft.

3.2. Immediate

- 3.2.1. The modification of existing dugout canoes to give greater robustness, improved seaworthiness, increased load carrying capacity, greater longevity and better performance as commercial fishing craft, at affordable prices.
- 3.2.2. The supply, at realistic prices, of new designs of modern canoes made from marine plywood (incl. Duraply) and/or planks, to other areas of PNG for a limited period only, to meet and promote demand as appropriate.

3.2.3. The training of fisheries staff and private individuals in the new designs and techniques developed, including continued back-up support to the owners of new craft. Assistance will be given to small-scale, private builders of the new designs to encourage them to take over the building of all future craft.

4. PROJECT LIFE AND WORK PLAN

4.1. Project Life

The newly recruited Technical Instructor in Canoe Building (TICB) employed by the National Department of Fisheries and Marine Resources will be based in Oro Bay, March 1987 to February 1989. He will have at least one full-time counterpart plus fisheries officers from other provinces visiting for short-term training periods. Private individuals will be eligible to apply for a limited amount of living allowance whilst undergoing training. A limited number of casual workers will be employed as the work load requires.

It is proposed that the TICB should leave Oro Bay, together with all national department staff in February 1989. Oro Bay Fisheries staff would continue the project in a supervisory/advisory capacity through to early 1991. From 1991 onwards, if the project has been a complete success, village canoe building using improved methods should continue in Northern Province without further government subsidy. Oro Bay Fisheries would still retain

the ability to give appropriate technical advice and some instruction, if and when required.

4.2. Programme Planning

An outline of the proposed programme is given in the bar chart below. † It should be noted that the time frame is subject to a number of constraints, including the availability of funds, materials and the response of staff and private individuals to the level of training received. Programme reporting and evaluation is important and will be used to modify the project if and when necessary.

5. SUPERVISION AND STAFFING

5.1. Supervision

The programme activities will be co-ordinated and supervised by the senior fisheries extension officer (SFE0) who in turn reports to the chief resource development officer (CRDO) of the National Department of Fisheries and Marine Resources. The person responsible for the implementation of the project is the technical instructor in Canoe building (TICB). The TICB will be responsible for maintaining close links with the Oro Bay Fisheries Authority and other provincial authorities.

5.2. Staffing

The success of the project, in the long term, hinges on the suitability of the fishing craft developed, the potential for fishing and coastal trade in the

† See p.15.

province and the performance of project staff. It is important that persons of suitable maturity, experience, qualifications, motivation and leadership qualities are selected as project staff. Because of restrictions on the number of new persons which may join the public service and the necessity to ensure that canoe building is handed over to the public sector the programme requires to employ skilled staff on a casual basis. Skilled tradesmen rates will be paid to attract competent personnel.

The staff requirement for the programme is given below.

<u>Position</u>	<u>Basic Qualification</u>	<u>Salary/Wages Paid By:</u>
TICB	Tradesman	DFMR/CIM
Senior Shipwright	Tradesman	OBC*
Counterpart Project Co-ordinator	Diploma Fisheries	OBC*
Asst. Shipwright	Trade experience	OBC*
Fisheries Technician 1.	1. Certificate in Fisheries	DFMR
	2. Certificate in Fisheries	OBFA
Carpenter	Experience only	OBFA
Casual labour when required		OBC*
Trainees (private)		Living allowance only*

* Require project funding.

6. INPUTS REQUESTED FROM FUNDING AGENCIES (TWO YEARS)

6.1. Programme Staff Salaries 1987-1988

6.1.1. Senior Shipwright/foreman	4.4
6.1.2. Counterpart Project Co-ordinator	9.6
6.1.3. Assistant Shipwright	5.2
6.1.4. Casual labour (2 of) @ K30/wk.	<u>3.2</u>

Sub Total 6.1 26.4

6.2. Training Funds

6.2.1. Living allowance for local village groups (2/day x 8 weeks x 3 members x 15 groups)	5.0
6.2.2. Airfares for private trainees	2.0
6.2.3. Living allowance for trainees for outside the province K3/day. K3/day x 6 weeks x 4 persons/yr.	<u>1.0</u>

Sub Total 6.2 8.0

6.3. Materials Costs.

6.3.1. Dugouts (6xK1,000, incl. one project vessel)	6.0
6.3.2. Red Snappers (2xK1,500, incl. one project vessel)	3.0
6.3.3. Waste materials for training purposes	2.0
6.3.4. Workshop extension	1.5
6.3.5. Roofing for dugouts under construction (bush)	0.5
6.3.6. Bush materials accomodation for groups	<u>0.5</u>

Sub Total 6.3 13.5

6.4. Tools, Engines and Equipment, spares

6.4.1. Workshop hand tools	2.3
6.4.2. Workshop small power tools	1.4
6.4.3. Small table saw	1.2

6.4.4. Thicknesser	6.5.
6.4.5. Replacement of tools, useables, spares	1.0
6.4.6. Diesel longtail imported complete	2.0
6.4.7. Funds to test locally made longtail	2.0
6.4.8. Two project outboards	<u>2.0</u>
	<u>18.4</u>
6.5. <u>Staff Travel</u>	
6.5.1. Purchasing of materials, airfares	1.0
6.5.2. Assistance to other provinces	<u>3.0</u>
Sub Total 6.4	<u>4.0</u>
6.6. <u>Consumables</u>	
6.6.1. Generator fuel for station	4.0
6.6.2. Paper, publishing manuals	<u>1.0</u>
Sub Total	<u>5.0</u>
6.7. <u>Consultancy Naval Architect 1.5m/m</u>	6.0
Totals 6.1 to 6.7	<u>81,300</u>

PNG GOVERNMENT CONTRIBUTIONS (2 YEARS)

		K(,000)
		37,6
7.1	Salaries	4,0
7.2	Supervision and Co-ordination, office	9,0
	Facilities	2,0
7.3	Accommodation	2,0
7.4	Workshop use	2,0
		<hr/>
	Sub-Total	<u>K52,6</u>

8. BUDGET: FINANCIAL SOURCES SUMMARY

Item	Outside Funding Requested K(000)	National Government K(000)	Provincial Government K(000)
	25,4	26,2	11,4
8.1 Salaries	8,0		
8.2 Training funds	13,5		
8.3 Material costs	18,4		
8.4 Tools, Engines, Equipment	4,0		
8.5 Staff Travel	5,0		
8.6 Consumables			11,0
8.7 buildings, Accommodation.		4,	
8.8 supervision/co-ordination etc.	6.0		
8.9 Naval Architect Consultancy	<hr/> 6.0	<hr/>	<hr/>
	81,3	30,2	22,4
		<hr/>	<hr/>
	Sub-Total		

Less funding already received
from IHAP, within country. 7,5

Outside funding sought to value of K73,800

9. AGENCIES WHICH HAVE ALREADY CONTRIBUTED.

9.1 The International Human Assistance programme was based in PNG until December 1986 and contributed K7,500 to assist village groups participate in the project.

9.2 The German funded body CIM, a recruiting assistance body, has provided the salary top-up and overseas allowance for the TICB.

10 REPORTING

Accurate costings will be maintained on all vessels built. Quarterly and annual reports will be submitted by the TICB to DFMR, copied to OBFA. Project evaluation will be carried out annually by a committee comprising of the SFEO, TICB and the Manager of OBFA. If a need is found to alter the scope of the project in anyway, aid donors will be advised of this by the Secretary of DFMR. A full programme document will be submitted to all interested parties on completion of the first two years of the programme. Annual reports of the two subsequent years will be provided by OBFA.

11. CONSTRAINTS

The OBC starts operation in early March 1987 at a reduced scope to that described above. Thanks to initial assistance from IHAP in funding two small feasibility projects (now complete) on Red Snapper Canoes, and the construction of Tohana (an improved dugout) and for a contribution to get started, work can commence immediately. The actual scope and long term effect of the project will be determined by the level of donor assistance received to fund extra staff, materials, engines and training, as indicated in the proposed budget. If additional funding can be found as indicated above, the programme will be able to extend to another province in 1989.

10

PROGRAMME IMPLEMENTATION BAR CHART.

ACTIVITY	1987			1988			1989
	MAY	JUNE	SEPT	MAY	JUNE	SEPT	MAR
1. Arrival of staff							
2. Purchase of tools, materials		*					
3. Construction of dugouts three at a time	—	—	—	—	—	—	
4. Three month free trial period.							
5. Supervision of new craft and loan repayments							→
6. Extension to Workshops		—					
7. Construction of bush material single quarters		—					
8. Training sessions on Re! Sagger Construction			—	—	—	—	
9. Assistance to local private builder(s)							→
10. Construction of Red Saggers, two at a time		—	—	—	—	—	
11. Design work on outriggers by naval architect (no visit necessary for this)	—						
10. Visits by Naval Arch.			—			—	
11. Some work on prototypes as required				—	—	—	
12. Quarterly reports							
13. Annual reports				—			
14. Project evaluation and redirection if neces.				—			—
15. Full project report							—

Notes: † Devotes recruitment from private sector: a mature skipper with the necessary ability to develop the necessary technical and managerial expertise to take over from the present TICB
 * Devotes arrival of larger equipment depending on aid funding availability.

The Red Snapper canoe is a new different design in dugouts, now fully tested, proven and well liked by PNG fishermen.

A NEW CANOE DESIGN UNDER TRIAL AT DPI KANUDI

D.R. Cooke

12 March 87.

From: "HARVEST MAGAZINE" 1985 Vol 11
publication of Department of Primary Industries
Kororua, Papua New Guinea

By David C. Cook, Senior Fisheries Extension Officer,
Resource Development Section, Fisheries Division, D.P.I. Kanudi.

INTRODUCTION

Gear and vessel appraisal work was started in Papua New Guinea by the Fisheries Research and Surveys Branch of the National Fisheries Division, D.P.I.. A new unit was set up in November 1983 and the functions of this unit were later transferred to the Resource Development Section in September 1985. The aim of this work is to undertake practical, development oriented research to find ways to make village level fishing operations more cost effective. Work is being carried out to show how local fishermen may:

- increase their catch for a given amount of work
- decrease their operating costs per kilo of fish caught.

This article describes a project to carry out trials on a new canoe design to test its suitability for village fishing operations. The new design seems to have several advantages compared to local vessels.

The project is a joint venture involving the National Fisheries Division, the Lwanga Youth Development Centre in Gerehu, National Capital District and the International Human Assistance Programme (IHAP).

THE CANOE DESIGN

The canoe design which has been chosen for testing in Papua New Guinea is known as the 'KIR-4' or 'Red Snapper' design. This design was released in January 1985.

Features of the Red Snapper canoe are shown in the drawings on page 110 and in the photographs on pages 111 and 114.

The canoe is designed to be used mainly under outboard power. However, it is recommended that it is fitted with a 9 m² sail. The sail is hoisted on a mast which fits together in two parts. This type of sail and mast arrangement is known as a gunter rig. The sail can be used when conditions are favourable for sailing, and also as a safety back up.

The recommended range of outboard motor size for use on the Red Snapper canoe is between 2 and 10 hp.

WHY CHOOSE THE 'RED SNAPPER' CANOE FOR PAPUA NEW GUINEA?

There are several reasons for believing that the Red Snapper canoe design is particularly suitable as a small-scale commercial village fishing craft in Papua New Guinea. These are listed here:

- It is similar in layout to traditional dugout canoes.
- It can carry heavier loads and withstand rougher seas than most dugouts of a similar size.
- Its fine lines and relatively light weight make it a fast craft when powered by outboards as small as 8 hp.
- It is easy to sail with the wind coming from either side of the vessel - i.e. the outrigger does not have to be kept to windward.

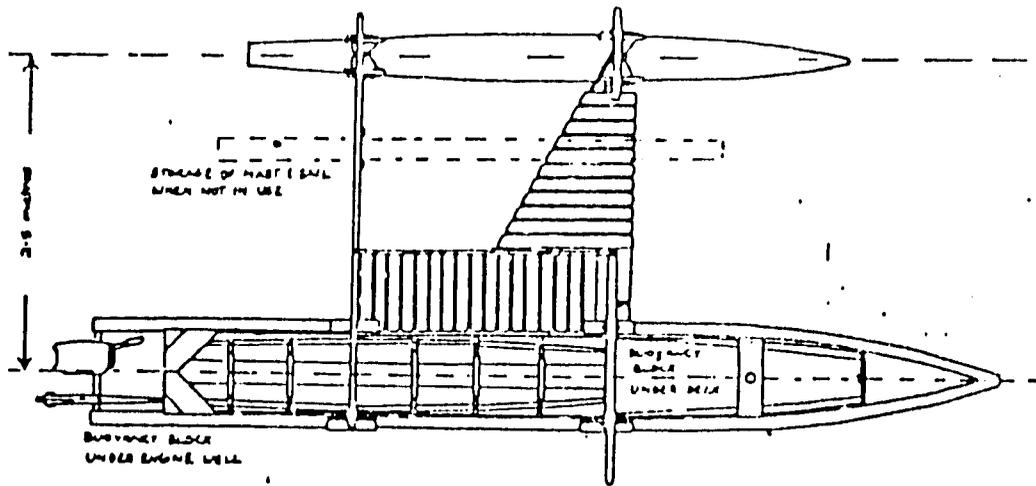
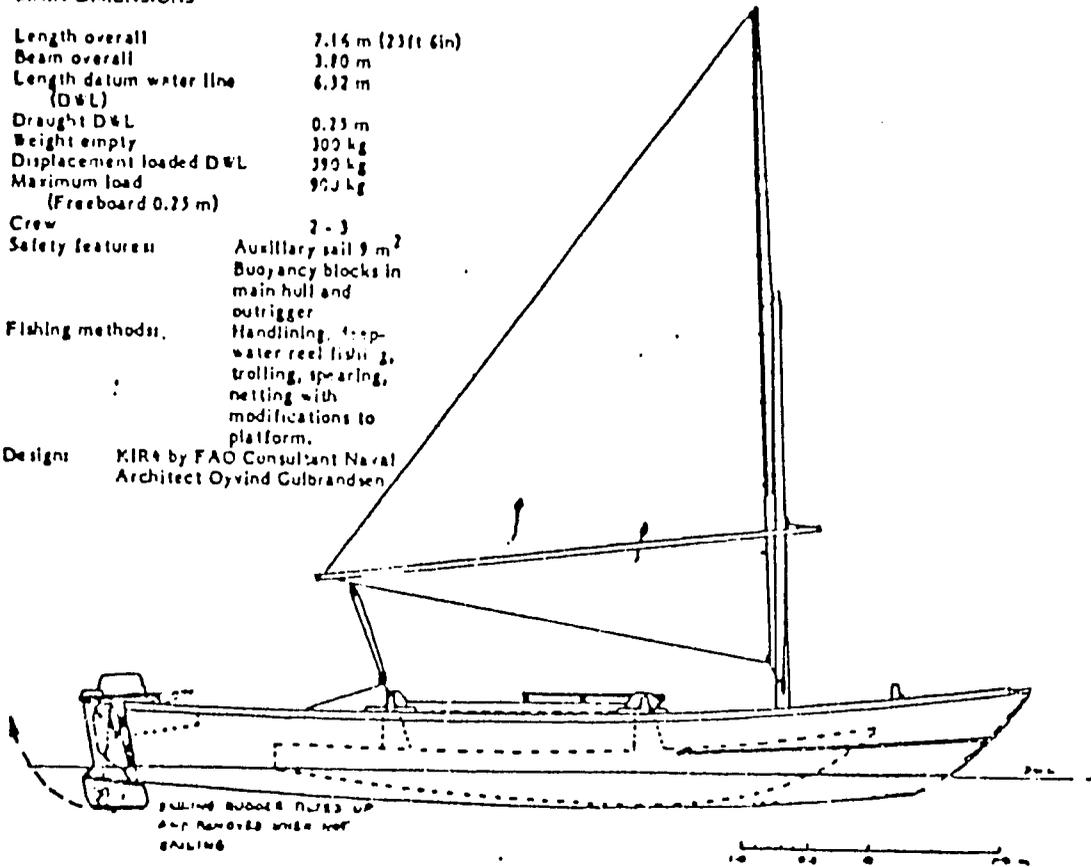
MAIN DIMENSIONS

Length overall 7.14 m (23ft 6in)
 Beam overall 3.70 m
 Length datum water line (DWL) 6.32 m
 Draught DWL 0.23 m
 Weight empty 300 kg
 Displacement loaded DWL 390 kg
 Maximum load 900 kg
 (Freeboard 0.23 m)

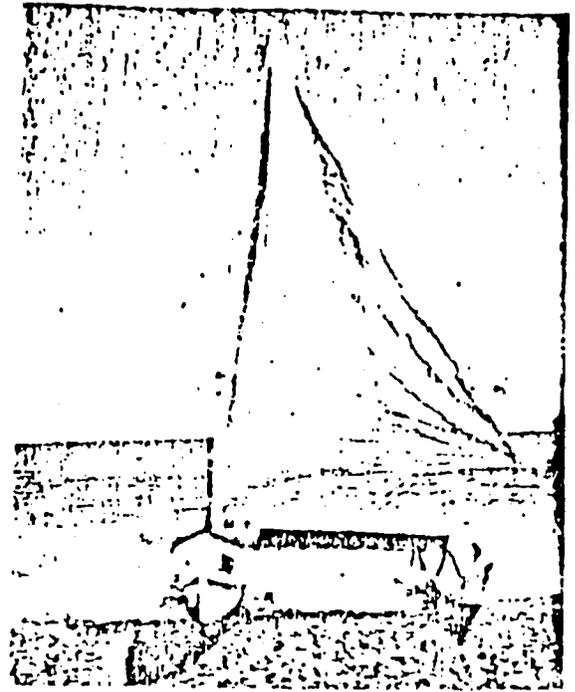
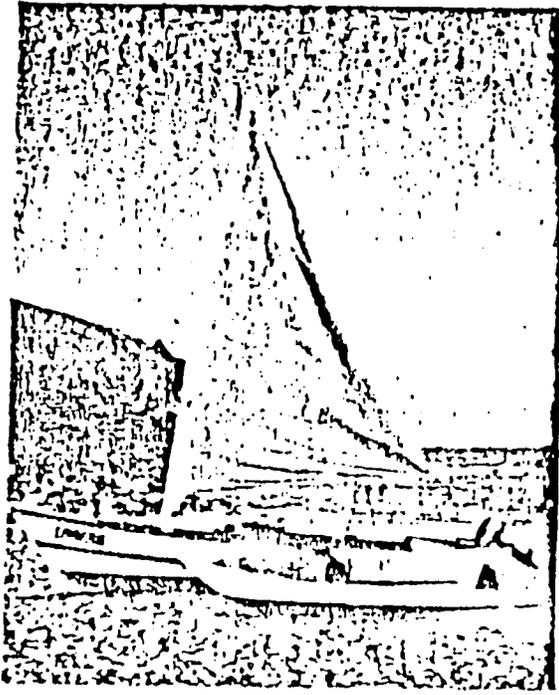
Crew 2-3
 Safety features: Auxiliary sail 9 m²
 Buoyancy blocks in main hull and outrigger

Fishing methods: Handlining, deep-water reel fish, trolling, spearfishing, netting with modifications to platform.

Design: KIR4 by FAO Consultant Naval Architect Oyvind Gulbrandsen



These diagrams show the main features of the Red Snapper canoe.



The Red Snapper canoe "Iamera" was the first of these canoes to be completed. Side (left) and front (right) views, showing the gunter rig sail.

- It is fairly light; 8 men can carry it.
- It has a double planked bottom, so that the outer layer can be replaced when spoiled by marine (sea) worms. The inner layer is protected by a sandwich layer of hydroseal.
- the hull may be built entirely from planks instead of using plywood.

Thus, this new design appears to have several advantages over both traditional dugout canoes, and imported dinghies.

The designer of the canoe, Oyvind Gulbrandson, is a well-known specialist in small-scale tropical fishing craft with extensive experience throughout the Pacific. He developed the Red Snapper canoe design during a successful and on-going 3-year project in Kiribati. The aim of his work in the Kiribati project is to provide sound, locally built and less costly fishing vessels than imported dinghies. There is a similar need in Papua New Guinea for low-cost, appropriate, improved fishing craft.

When considering how useful the canoe may be, the following points should be remembered.

1. Cost The materials to build a Red Snapper canoe cost about K1150, including the sail. Labour costs are estimated at about K1000. Therefore, this canoe may be suitable only for use by fishermen where there are opportunities to earn a cash income. It also has considerable potential as a low cost leisure craft for weekend use by the wage earner.
2. How long should the canoe last? If they are correctly built and properly looked after, plywood canoes such as the Red Snapper canoe should last as long or longer than most dinghies that are being sold in Papua New Guinea and used by village fishermen. However, plywood vessels do need more skilled care than dugout canoes and dinghies. People who intend to use the canoes must be trained to look after and maintain their vessels.

3. Sailing technique. The light weight of the outrigger means that if the canoe is sailed in fresh winds with the outrigger to windward, crew ballast (weight) is needed over the outrigger side. Otherwise the canoe could capsize. Again, people who are going to use the canoe should be trained in this, but those skilled in sailing local canoes will not find this a problem.

OPERATION RED SNAPPER

Once it had been decided that the Red Snapper canoe design was worth testing in Papua New Guinea, a project, known as 'Operation Red Snapper' was started. It had the following aims:

1. To run canoe building courses at a

suitable training centre - the Lwanga Youth Centre - while building three Red Snapper canoes.

2. To train youths and village fishermen in the practical skills needed to build and look after the canoes, working with little supervision, and to assess the level of skills required to build this type of canoe.
3. To train those taking part in the project to use the canoes for deep water snapper fishing using recently introduced wooden hand reels.
4. To assess whether the design is suitable as a small scale commercial fishing craft for village-level fishing in Papua New Guinea, and as a possible alternative to imported dinghies.



The Red Snapper canoes taking shape at the Lawanga Youth Development Centre, Gerehu.

The canoe in the top picture is "Iamera". The lower picture shows the "Parela" and "Tadiva" under construction.

THE FIRST RED SNAPPER CANOES FOR PAPUA NEW GUINEA

The first three Red Snapper canoes, were completed at the Lwanga Youth Development Centre in 1985. Money to fund two training courses was obtained from the International Human Assistance Programme (IHAP). IHAP is a USA-based organisation which has during the past 4 years provided financial help (money) for fishing groups in 12 Papuan Villages.

The Lwanga Youth Development Centre is at Gerehu, National Capital District. It is run by the Roman Catholic Sisters from the Mission of the Sacred Heart, and employs a qualified technical instructor Michael Hartong who is a German volunteer. He is responsible for running the canoe building instruction courses.

The Centre has a modestly - equipped workshop. Every year, 15 to 20 youths receive training in carpentry and other technical skills. The Centre is intended especially to help youths who left school early, and who have little or no opportunity for other formal training.

Youths from fishing groups from Roku, Kouderika and Yabukori villages took part in the construction of the three canoes and received training in the process. These three villages are all quite close to Port Moresby.

Students at the Lwanga Centre, a carpenter from a Yule Island vocational centre and a Fisheries Division carpenter also received training and assisted with the construction of the canoes.

TESTS WITH DIFFERENT SIZES OF OUTBOARD MOTORS

The Red Snapper canoes perform well when powered by small outboard motors in the 4 to 10 horse power range. Thus considerable savings in fuel costs are possible when compared to village canoes powered by 25 hp outboards. The top speeds obtained with a crew of three in a light breeze for different sizes of outboards were as follows:

4 hp gave 6.7 knots (12 km/hr)
8 hp gave 9.3 knots (17 km/hr)
10 hp gave 9.5 knots (17.5 km/hr).

At speeds of 8 knots the Red Snapper canoes travel about 4 km/l when powered by an 8 hp two-stroke outboard and about 6.5 km/l when powered by a 10 hp four-stroke Honda outboard.

Used on the canoe, the Honda four-stroke 10 hp would cover 53 nautical miles (nm) i.e. 98 km, at 9.5 knots at full throttle, and 70 nm (130 km) at 8 knots (three quarters throttle) on a full 20 l tank of fuel.

These figures depend on the canoe having a load equivalent to three persons. The greater the load the lower the speed, and the higher the fuel consumption. Note also that at slower speeds, for given conditions, engines usually travel further for a given amount of fuel: a useful point to remember if you are trying to economise on fuel or get home on an almost empty tank!

The fishermen of Roku village use an 8 hp Yamaha outboard on the "Iamera", the Red Snapper canoe they are testing. They have commented on the fuel savings they make using this combination instead of their local canoe and a 25 hp outboard. They note that the "Iamera" with the 8 hp outboard goes faster than their own canoe when powered by a 25 hp outboard. They also say that the 8 hp outboard on the "Iamera" goes about twice as far on a full tank of fuel than their usual canoe using their 25 hp. Our measurements reveal that in fact it will go over three times as far.

These figures of course depend on the load each vessel is carrying and the amount of throttle opening used. This large difference in fuel consumption is a significant advantage to the Red Snapper canoes in some types of fishing, e.g. trolling or when travelling regularly to distant fishing grounds.

PERFORMANCE IN ROUGH SEAS

During the South-east or 'Laurabada' season, fishermen regularly commented on how impressed they were with the

performance of the Red Snapper canoe in winds of around 25 knots (45 km/hr) the canoes perform well. Although quite a lot of spray may fly up in strong winds, surprisingly little water comes inside the canoe.

When travelling with a rough following sea the canoe gathers speed and surfs with the waves. There is a slight tendency to broach (turn sideways) in these conditions but this can be corrected by the outboard operator.

It was once noted that the outrigger lifted out of the water in rough conditions when travelling down a wave in seas averaging about 2 metres. This was prevented by one of the crew moving onto the outrigger platform and so balancing the canoe.

Although these canoes appear to be very stable, it must be remembered that they are still experimental craft. They cannot yet be guaranteed for all types of conditions, or under inexperienced hands. Clearly, care should be taken during strong winds and in times of radio warnings to small ships.

PERFORMANCE UNDER SAIL

The "Iamera" has been sailed in winds up to about 20 knots. The full 9 metre square gunter rig was found easy to manage in winds of up to about 18 knots (estimate). Above this it was better to reduce the sail area by reefing (rolling up the bottom part

part of the sail and lashing it tight).

Unlike local canoes the Red Snappers actually sail better with the outrigger down wind, than upwind. The buoyancy of the outrigger prevents it being pushed under the water while it still "bites" into the water and helps reduce sideways drift.

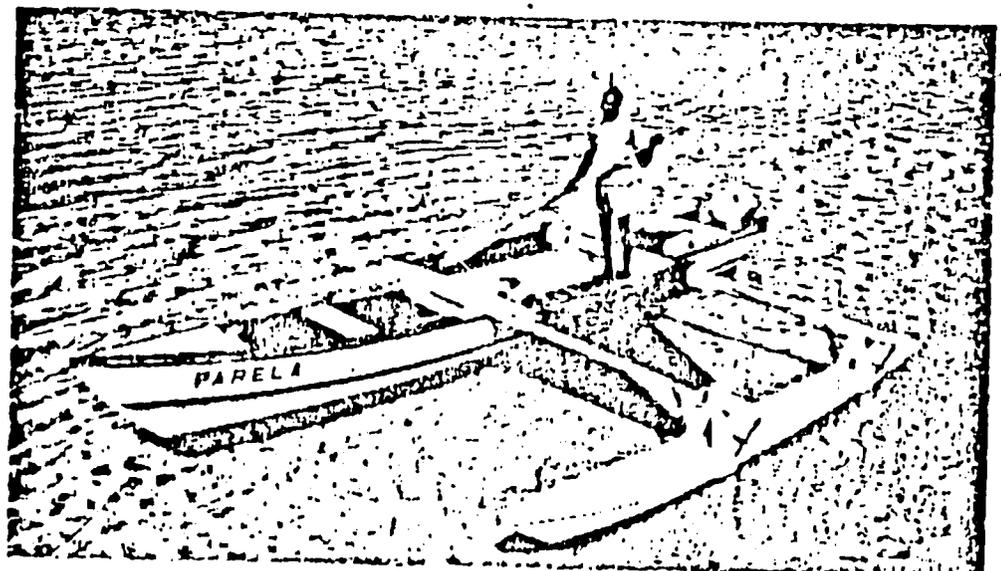
Because of the buoyant outrigger the canoe has only one sharp end. Direction is changed when sailing simply by going across the wind. This is called "tacking" or "going about" when going upwind and "gybing" when travelling down wind. When attempting to tack it has been found necessary to assist the canoe round with paddles. This can be difficult at times. Gybing however can be carried out easily.

FISHING TRIALS

The canoe deck layout was originally designed for trolling and handlining in Kiribati and not for net fishing. Hence a simple netting platform has been designed and fitted to the "Iamera". The Roku fishermen consider that this improves the craft's potential as a net fishing vessel.

Ice boxes of various sizes capable of carrying up to 200 kg of fish plus ice can be fitted between the outrigger beams inside the hull. The lid of the ice box serves as part of the outrigger platform. In the photograph below the white area between the outrigger beams is the lid of the ice box on the "Parela".

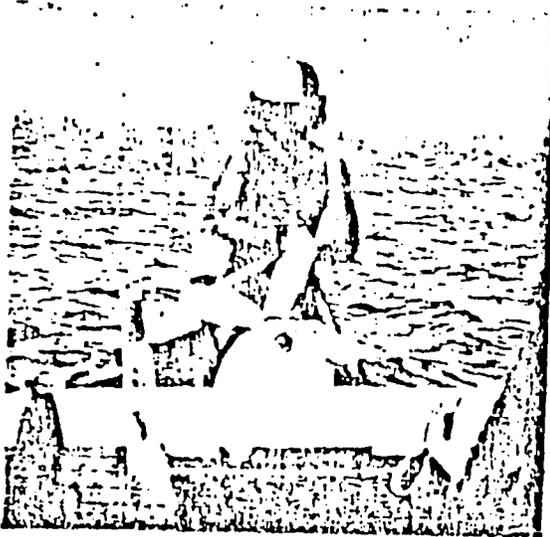
The deck layout of "Parela". The white deck area to the left of the man is the lid of the ice box.



Deep-water fishing for Red snapper and Red emperor is a new method of fishing to Papua New Guinea which the Fisheries Division is successfully introducing to a number of areas. The Red Snapper canoes display considerable potential as a relatively low-cost, locally made, small-scale commercial snapper fishing craft. Wooden handreels, modified versions of the now fairly popular Western Samoan type, can be easily fitted to these canoes.

The Fisheries Division is training groups taking part in Operation Red Snapper, in the use of handreels and how to locate the resources of Red snapper and Red emperor. Top catches made by Roku fishermen have been up to 250 kg of Red emperor per night.

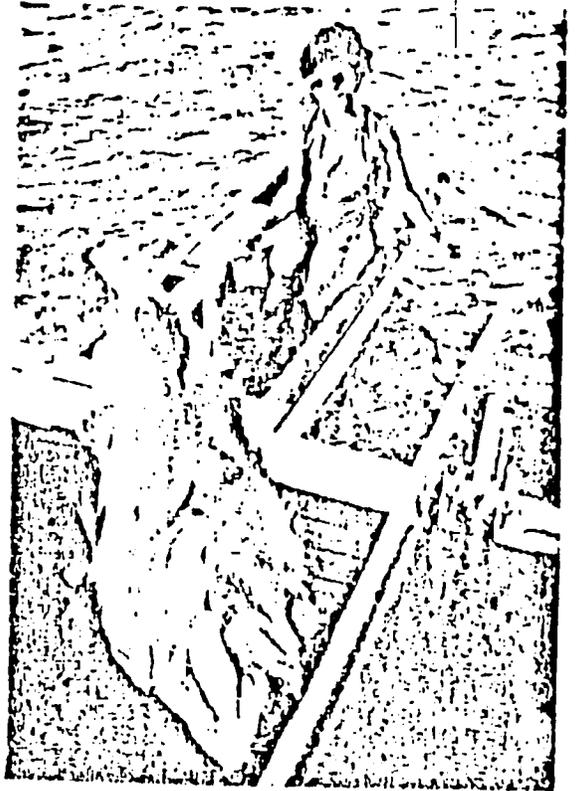
Two reels are fitted per canoe as shown in the photograph:



This photograph shows how the deep water wooden fishing reels are fitted and operated.

The strength and stability of this arrangement was demonstrated on the first handreel fishing trip made by the "Tadiva". The 80 kg Giant grouper illustrated below was hooked in 180 metres on Boxing Day 1985. The Grouper was hauled on board within 10 minutes of first being hooked.

The design has also been shown to be well-



This 80 kg Giant grouper was landed on board the "Tadiva" on its first fishing trip, using handreels.

suited to trolling. The outrigger gives good stability in choppy seas. The stern of the canoe is a safe and comfortable spot from which to work the lines. The hand-reels may also be used to haul two of the four lines which are usually set. For trolling, an extra outrigger trolling pole is fitted to the side away from the outrigger to increase the space between lines and so reduce the risk of tangles.

When trolling with the Red Snapper canoes fitted with a 10 hp four-stroke outboard motor, fuel costs are about K1.20 per hour. This compares to over K3 per hour when using a local canoe powered by a 25 hp outboard motor. The low fuel costs and the new canoe's greater speed, together with the amount of Skipjack tuna to be found off Port Moresby in the right season combine to suggest that greater use will be made of these craft in the future for trolling.

THE REAL TEST

For 18 months before the project started, four groups participating in the project provided details of their daily catch and operating expenses, using their normal canoes and fishing materials. Information gathered from their fishing operations using Red Snapper canoes will show whether the new canoes can be used to undertake more cost-effective fishing than their local craft and/or imported dinghies.

The real test for the success of the project will be whether more village fishermen decide they would benefit from using canoes of this new design. If this happens it is hoped that one or more local carpenters will be trained to build the canoes in village-level workshops. If the results of the trials continue to be encouraging it is hoped that the various financial institutions such as the Agricultural Bank will consider lending money to fishermen wishing to buy this type of craft, in areas where it can be shown to be suitable.

* { Following the initial trials big business has already shown an interest. Steamships Slipway, run by Engineering and Marine Services Ltd of Port Moresby have accepted orders for three canoes. These are under construction at the time of writing. The price they have quoted is K1953 for the unpainted vessel, supplied without sail and spars, and K2640 supplied painted and complete with sailing gear. The engine is not included in these prices.

ALTERNATIVE NEW DESIGNS

No single design of fishing craft is ever suited to all areas and all types of fishing. For the more rural areas of PNG where trees for dugouts are still plentiful, where the price of fish is low and where there is not the demand for speed such as exists around urban areas, a cheaper alternative based on the dugout log may be preferable.

A future article in Harvest will describe a project to construct and test a new design of dugout canoe. The design, using improved and more modern, but still relatively simple construction techniques has been developed to give a robust, seaworthy canoe capable of transporting heavy loads in moderately rough seas when built around a relatively small dugout log.

ACKNOWLEDGEMENTS

The author would like to thank the following:

- The International Human Assistance Programme for funding the two training courses and the materials to build two canoes.
- The Roman Catholic Sisters from the Mission of the Sacred Heart, who run Lwanga Youth Centre, and who hosted the course.
- Michael Hartong for the time, effort and skill put into the training courses, and all at Lwanga Youth Development Centre for their contributions.

FURTHER INFORMATION

For further information about the Red Snapper canoes in Papua New Guinea, you can contact:

Resource Development Section
Fisheries Division
Department of Primary Industry
P.O. Box 417
Konedobu

Tel: 214522 ext: 42

or Michael Hartong 297352

* Steamships lost money on this deal, through lack of supervision, resulting in inefficiency. The preferred way would be to train small village yards (say good carpenter-joiner with only one assistant) to make them with minimum overheads. Training such people would be one of the main functions of OBC. 116

12/1/77