フィジー・ツバル水産資源調査
作業監理調査団報告書

昭和59年12月

国際協力事業団

フィジー・ツバル水産資源調査
作業監理調査団報告書

昭和59年12月

国際協力事業団

はしがき

フィジー国においては、鰹一本釣漁業が最重要輸出産業のひとつであるが、この漁業に必須な生餌の供給が不安定なため順調な発展を遂げ難い状況にある。

そこで、同国政府は、上記漁業の安定的振興を図るため、わが国に対して同国周辺海域における水産資源の状況及びこれら資源を漁獲する適切な魚法の調査の実施を要請した。

その後、フィジー国と相互に入漁しているツバル国から同様な調査の要請があり、検討した結果両国の調査を一体化して実施することが適当であるとの結論に達し、昭和５８年１０月に上記２カ国を対象に水産資源調査のＳ／Ｗを締結し本件調査を実施する運びとなった。

昭和５９年９月に、上記Ｓ／Ｗに基づく第１回合同委員会が開催されることとなったので、当事業団は、海洋水産資源開発センター顧問大鶴典生氏を団長とする作業監理調査団をフィジー国に派遣し、現地における本件調査の実施状況を調査するとともに、合同委員会において昭和５９年度の洋上調査計画及び、ツバル政府が提供する調査船の改造計画について協議することとした。

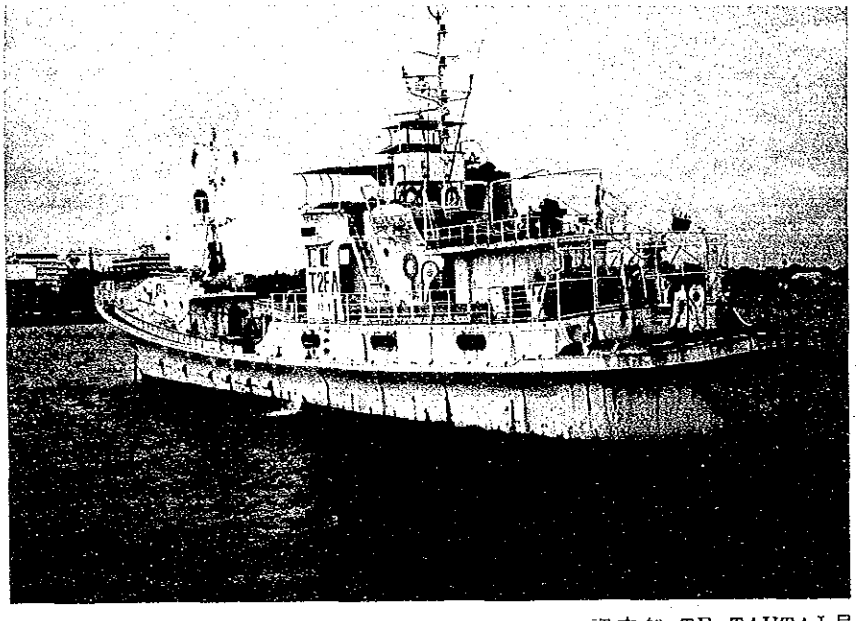
本報告書は、同調査団の調査及び、協議結果を取りまとめたものである。

終りに、本調査団を派遣するに当りご協力を頂いた外務省、農林水産省、在フィジー日本大使館の関係各位並びに本調査に参加していただいた団員の方々に対し深甚なる謝意を表する次第である。

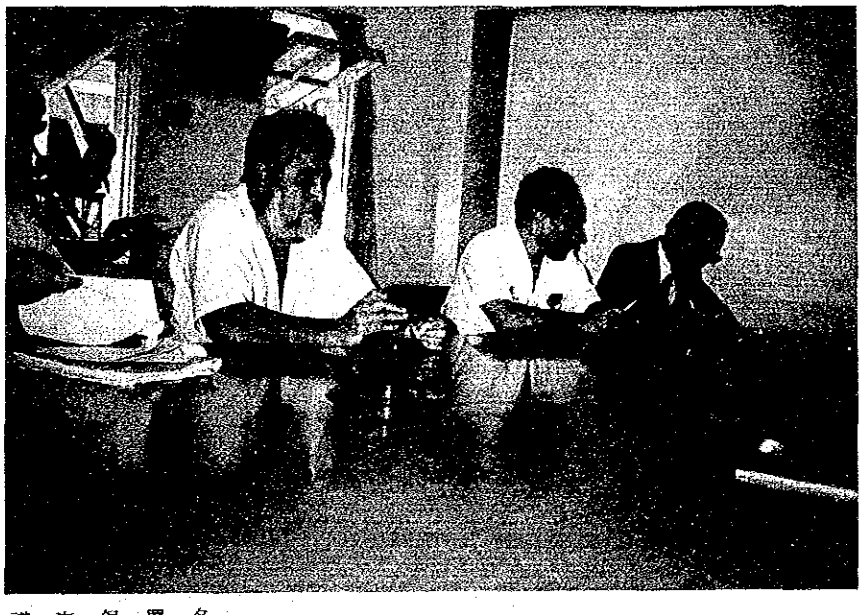
昭和５９年１２月

国際協力事業団
林業水産開発協力部
部長　渡辺　桂

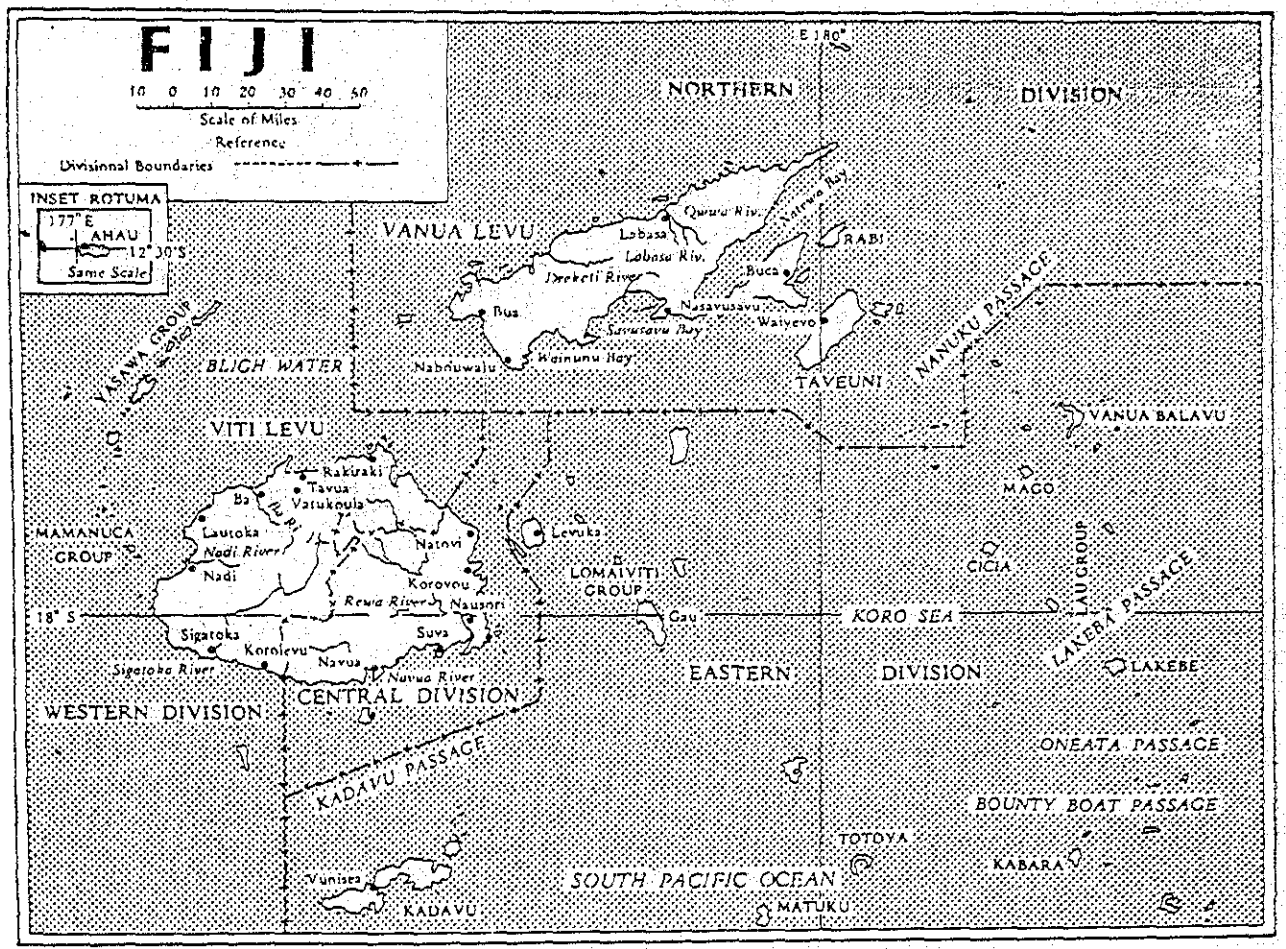
第１回合同委員会

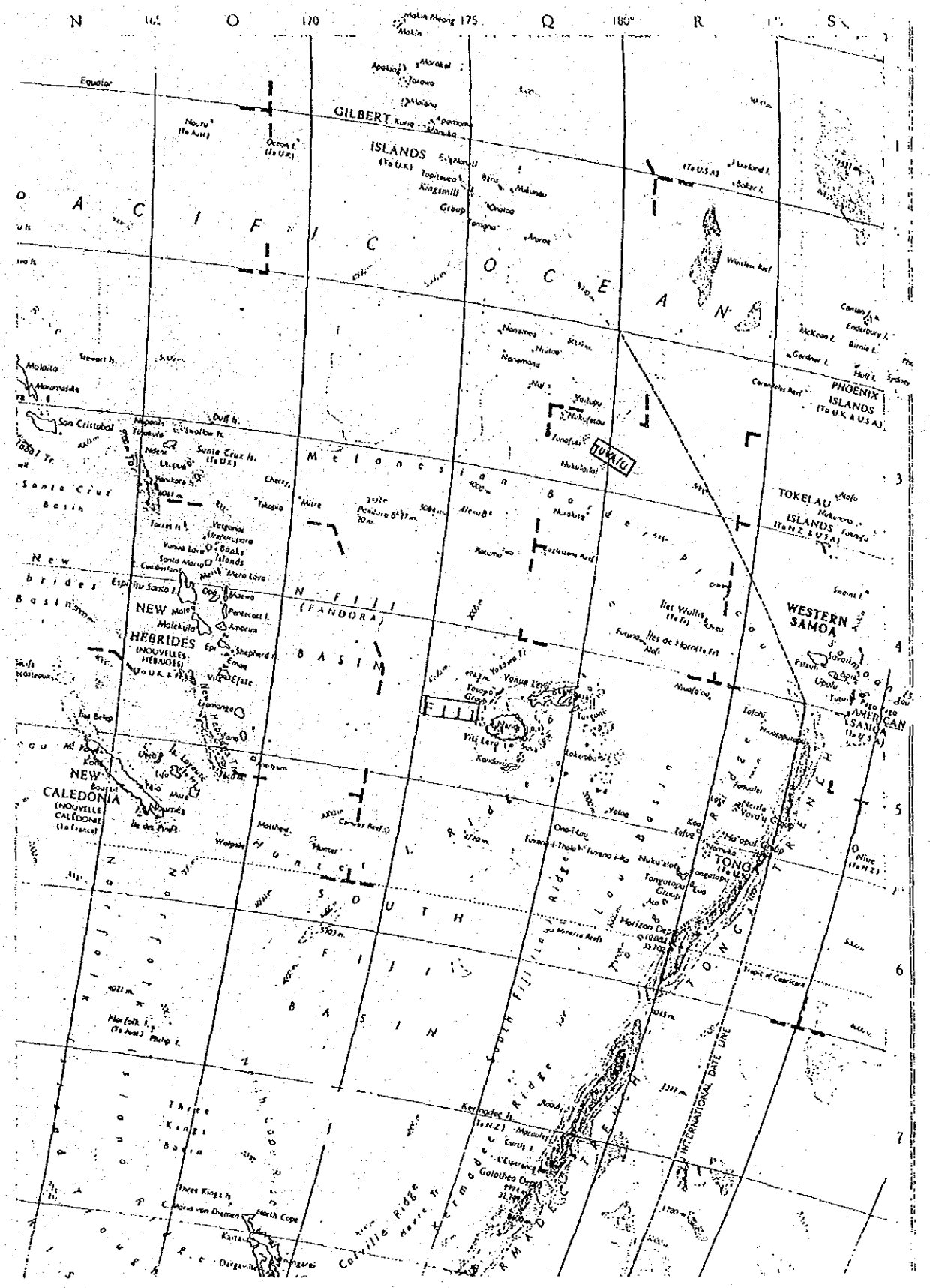


調査船 TE TAUTAI号



議事録署名


FIJI
10 0 10 20 30 40 50
Scale of Miles
Reference
Divisional Boundaries
INSET ROTUMA
177° E
AHAU
12° 30' S
Same Scale
NORTHERN
DIVISION
VANUA LEVU
Lobasa
Qwara Riv.
Natewa Bay
RABI
Lobasa Riv.
Drekeli River
Buca
Bua
Nasavusavu
Waiyevo
Savusavu Bay
Nabouwalu
Wainunu Bay
BLIGH WATER
YASAWA GROUP
TAVEUNI
MANUKU PASSAGE
VANUA BALAVU
VITI LEVU
Rakiraki
Tavua
Ba
Vatukoula
MAGO
MAMANUCA GROUP
Lautoka
Nadi River
Nadi
Natovi
Levuka
CICIA
LOMAIVITI GROUP
Korovou
Rewa River
Nausori
Gau
KORO SEA
LAU GROUP
LAKEMBA PASSAGE
18° S
Sigatoka
Korolevu
Navua
Suva
Sigatoka River
Nuvua River
EASTERN
DIVISION
LAKEBE
WESTERN DIVISION
CENTRAL DIVISION
ONEATA PASSAGE
KADAVU PASSAGE
BOUNTY BOAT PASSAGE
TOTOYA
KABARA
Vunisea
SOUTH PACIFIC OCEAN
KADAVU
MATUKU


N
O
170
175
Q
180°
R
S
Equator
GILBERT
ISLANDS
(To U.K.)
Nauru
(To Aust)
Ocean I.
(To U.K.)
Kingsmill
Group
Baker I.
Howland I.
Wake I.
PACIFIC OCEAN
Malaita
Stewart Is.
San Cristobal
Santa Cruz Is.
(To U.S.)
Santa Cruz
Basin
Melanesian
Bo
Banks
Islands
New
Hebrides
Basin
NEW
HEBRIDES
(NOUVELLES
HEBRIDES)
(To U.K. & Fr.)
Espiritu Santo I.
Malekula
Efate
Shepherd I.
Aneityum
N. FIJI
(PANDORA)
BASIN
Futuna
Alofi
Iles de Horn (Fr)
Iles Wallis
(To Fr)
Vanua Levu
Viti Levu
Kandavu
FIJI
NEW
CALEDONIA
(NOUVELLE
CALÉDONIE)
(To France)
Ile des Pins
Hunter
SOUTH
FIJI
BASIN
Norfolk I.
(To Aust)
Philip I.
Three
Kings
Basin
Three Kings Is.
Chatham
Rise
Colville Ridge
Kermadec Is.
(To NZ)
Curtis I.
Macauley
Galathea Depth
Horizon Depth
Tonga Ridge
Tonga Trench
TONGA
Tongatapu
Group
Niuafo'ou
Niuatoputapu
Tafahi
Vava'u Group
Ha'apai Group
Niue
(To N.Z.)
TUVALU
Funafuti
Nukufetau
Nanumea
Nanumanga
Niutao
Vaitupu
Nukulaelae
Nukufotau
Rotuma
Rotuma Rest
Tokelau
Islands
(To N.Z. & U.S.A.)
Fakaofo
Nukunonu
Atafu
PHOENIX
ISLANDS
(To U.K. & U.S.A.)
Canton I.
Enderbury I.
Birnie I.
Sydney
Gardner I.
Hull I.
McKean I.
Coral Sea Rest
Wooster Rest
WESTERN
SAMOA
Savai'i
Upolu
Apia
Pago Pago
AMERICAN
SAMOA
(To U.S.)
Swains I.
INTERNATIONAL DATE LINE
Tropic of Capricorn
Norfolk Ridge
Lord Howe Rise
Lord Howe I.
Ball I.
Middleton Reef
Elizabeth Reef
Cato I.
Ceva-i-Ra
Ono-i-Lau
Fulanga
Kadavu
Lakeba
Moala
Koro
Vatoa
Ata
Tongatapu
Eua
Niue
(To N.Z.)
Tonga Ridge
Tonga Trench
Kermadec Ridge
Kermadec Trench
Macquarie Ridge
Macquarie Trench
Tasman Sea
Lord Howe Rise
Norfolk Ridge
Three Kings Is.
Chatham Is.
North Cape
Kaitaia
Dargaville
Whangarei
Auckland
Tauranga
Gisborne
Napier
Wellington
Nelson
Christchurch
Dunedin
Invercargill
Bounty Is.
Antipodes Is.
Auckland Is.
Campbell I.
Macquarie I.
Tasman Sea
Lord Howe Rise
Norfolk Ridge
Three Kings Is.
Chatham Is.
North Cape
Kaitaia
Dargaville
Whangarei
Auckland
Tauranga
Gisborne
Napier
Wellington
Nelson
Christchurch
Dunedin
Invercargill
Bounty Is.
Antipodes Is.
Auckland Is.
Campbell I.
Macquarie I.

目　　次

I. 作業監理調査団の派遣目的

本件調査団は、ＪＩＣＡが昭和５８年１０月２７日に、フィジー・ツバル両国と取り交した当該水産資源調査に関する実施要領（Scope of Work，略称Ｓ／Ｗ）に基づき、昭和５９年度の調査計画及びツバル国がこの調査に提供することになっている調査船（TE TAUTAI号）の改造計画を討議し、承認を得るため、第１回目の合同委員会をフィジー国のスバ市で開催することになり同委員会に参加することを主たる目的として派遣された。

II. 現地作業監理調査団の編成

氏名	担当業務	現職
大鶴典生	団長（総括）	海洋水産資源センター顧問
森　慶一郎	調査計画	海洋水産資源センター開発部調査役
飯塚景記	資源解析	水産庁東北区水産研究所資源第二研究室長
安井　港	漁撈技術	静岡県水産試験場漁業開発部技術史員
橋浦廣志	業務調整	国際協力事業団水産業技術協力室々長代理

（同　行）

佐藤　傳	調査計画	㈱ホウスイ
笠原康平	資源解析	㈱ホウスイ

III. 調査団の日程

月　日	曜　日	内　容
９／　２	（日）	成田発　（２０：００時）
３	（月）	ＳＵＶＡ着、河西ＪＩＣＡ事務所と日程等の打合せ、ＴＵＶＡＬＵ国との漁業交渉団の藤波団長等と調査活動にかゝる意見交換等
４	（火）	日本大使館吉田大使及び和田参事官等表敬訪問、水産局訪問日程打合せ、IKA CORPORATION MANAGERと面談等
５	（水）	ＪＩＣＡ　ＳＵＶＡ事務所で第１回の合同委員会開催
６	（木）	IKA CORPORATIONで上記合同委続行、調査船　TE TAUTAI号視察点検、小委員会討議事項作成

月　日	曜　日	内　　容
7	(金)	第1次産業大臣及び次官を表敬訪問及び上記合同委員会の議事録作成
8	(土)	チーム内打合せ及び上記議事録完成
9	(日)	SUVA港の港湾施設視察等
10	(月)	FIJI国第一次産業省次官、TUVALU国高等弁務官及び大鶴団長が上記合同委議事録に署名、水産局で、漁場環境調査小委員会開催、その後、Dinner(団長主催)を開催
11	(火)	河西所長と今後の洋上調査実施細目等打合せ及び和田参事官等へ上記合同委の結果報告等
12	(水)	調査船点検、LEVUKA港視察等
13	(木)	水産局と打合せ等
14	(金)	TUVALU高等弁務官事務所と打合せ、及び帰国準備
15	(土)	SUVA発 → 成田着

IV. 主要面会者リスト

(フィジー側)

氏　　名	職　　名
Hon. C.A. Walker	Minister of Primary Industries
J, Makasiale	Permanent Secretary for Primary Industries
Ratu Tui S, Carluilati	Acting Chief Fisheries officer, Fisheries Division
Dr,A,D, Lewis	Principal Fisheries officer, Fisheries Division
M, McGregor	General Manager, Ika Corporation
N,C, Nath	Fisheries Assistant, Fisheries Division
(ツバル側)	
K, Lopati	High Commissioner to Fiji, The Government of Turalu
M,J, Batty	Fisheries Adviser, The Government of Tuvalu

（日本大使館）

吉田大使

和田参事館

町田書記官

（ＪＩＣＡ事務所）

河西所長

Ⅴ．合同委員会での討議内容

上記合同委員会では、わが方より各省協議等をえて策定された本年度の調査計画並びにツバル国が当該調査のために提供する調査船の改造計画が提示され、この討議を行った結果、わが方の原案のとおり上記計画は承認された。

なお、同合同委で現地側から申し出等のあった主な事項及びこれに対する、わが方の対応等は以下のとおりである。

1）カウンターパートについて

日本側は、カウンターパートは、技術の習得者を対象としているのに対し、現地側は調査員（Biologist）をも含めた広い範囲を想定しているため特に居住区について質問があったが、船型上居住区の改造は困難である旨説明した。今後開発途上国に無償供与する漁船について船型にもよるが、空調設備などは充分配慮する必要があると痛感した。

2）漁具漁法について

a）刺網について

１９８５年３月までについては最大長さ2,０００ｍで了承したが、それ以降については拡大出来るかどうか質問があったが、乗組員の練度と、この間の調査結果を合せて検討するが、日本側の規制問題もあるので、直ちに拡大することは困難である旨伝えた。

尚、合同委員会全員が入港中のテ・タラタイ号視察したが、船型上から最大限4,０００ｍと思われるので、この点を考慮し、今後の対策をする。

b）延　縄

ツバル側より鈎数は、一般には2,０００本位と聞いているがと質問あり、これ　対し、１鉢５本付ける原則とするので最大５００本である。

乗組員の練度の問題と労働時間の問題も含め、これが限度と思う。餌については、生餌が採捕出来ればと思うが、これも同一般作業のため連続操業は出来ない。

c）一本釣

新しく発見する海山のほか、すでに明らかになっている海山で今まで調達されていない海域を含め、沖合の漁場を調査する。

沖合海山附近の餌捕り問題の質問があったが、現在の棒受網による漁法では困難である。

環礁内の餌場については現地との調整が必要なので事前に協議することとなった。

d）手　釣

漁具漁法担当委員より、サンゴ海における生餌による手釣について説明したところ、現地側より強い関心がよせられた。

e）バヤオの設置問題

バヤオの設置について、フィジー側より質問と提案があった。

① 発注先

② 型式については、South Pacific Commission（S，P，C）ですでに可成開発しているので、この型式を利用したらどうか。

③ 設置場所については、新しく発見される海山に限定せず、現地船利用等も考慮し協議して欲しい。

④ バヤオに魚が蝟集するのに、３～６週間要するので現地側で事前に１０基投入する（但し5,０００ドル経費が必要である）。

回　答

①は、ＪＩＣＡ　ＳＵＶＡ事務所より現地発注とする

②、③は、現地側と充分協議することで了解、特に③については現地船利用出来る場所も含めて協議決定する。

④については、調査の主旨に合わないので、調査船で設置する。魚群の蝟集状況については、現地利用の場合は正確な報告を希望する。

3）漁場環境調査について

専門委員で別途協議する。

4）洋上調査実施計画について

洋上調査は、約２年間で次の通り

１９８４年１１月中旬より１９８５年　３月末まで

１９８５年　６月初めより１９８６年　３月末まで

１９８６年　６月初めより１９８６年１０月中旬まで

調査開始までに１９８５年３月までの実施細目を提示する。

１９８５年６月以降の暫定計画については、適宜協議に応ずる。

5）連絡体制

現在ＩＫＡ公社にある無線装置（ＳＳＢ）

機種　MARINER 1500　（MADE　IN　USA）

では、発信電力が弱く１００マイル以上は殆んど交通出来ず受信は可能なるも一方通信となるため安全体制が保証出来ないので、出力の大きいＳＳＢに変える必要があるとの要請があった。この件については、委員会でも前広に検討することとなった。

尚、ＩＫＡ公社から、次の機種が現地調達可能とのことであった。

１００　WATT　SYNTHSIDED　TRANSCEIVER

YAISU KENWOOD　約3,０００ドル

6）調査の報告

両国政府に調査記録を提出する。

7）調査船の改造

調査に必要な改造計画を承認する。

Ⅵ．昭和５９年度調査計画（(1) 英文及び(2) 和文）

第１回合同委員会で承認された本年度の調査計画（(1)英文及び(2)和文、含む、調査船の改造計画）は次のとおりである。

(1) Survey Programme

for

Fisheries Resources

in

Fiji and Tuvalu

September 1984

Japan International Cooperation Agency

FIJI & TUVALU
200 MILE FISHERIES ZONE

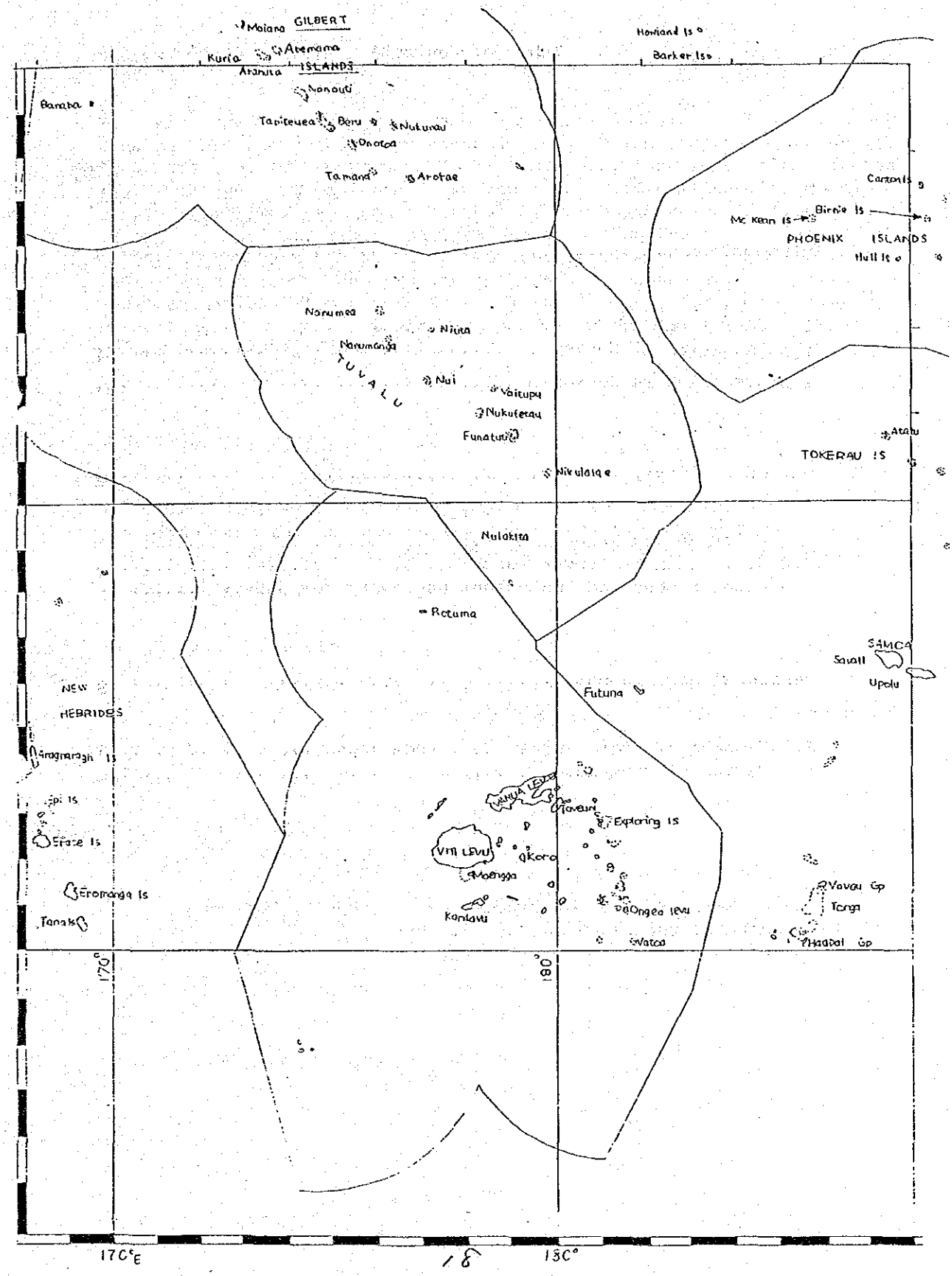


Table of Contents

* Scope of Work, Minutes of Discussion on Scope of Work and Memorandum of Understanding are Attached

1. Introduction

1.1 Background of Survey

The skipjack fishery has become an important industry both in Fiji and Tuvalu. Experience has been accumulated with the fishery which utilized live-bait from 1975 upto date in Fiji and from 1980 in Tuvalu. Through the experience, it has been known about the difficulties with obtaining live-bait all the year round because of the heavy seasonal fluctuation in the availability of the bait resources. Thus the instability of the supply of the bait has become a critical problem and it was realized that introduction of new fishing methods was necessary in order to develop the local fishery further. Trial for introducing new fishing method including gill net was requested to Japanese Government by the Governments of Fiji and Tuvalu.

1.2 Objective of Survey

To collect information concerning the fishery resources around seamounts and offshore area and to identify economical fishing methods to utilize those resources, based on the requests made by both Fiji and Tuvalu.

1.3 Overall Work Schedule

The period of the survey, from July 1984 to March 1987, will comprize three phases.

Phase I : (1) Preparatory study in Japan
(2) Preparatory study at sites
a. Discussion of the survey plan at sites
b. Conversion of the survey vessel
c. Data analysis in Japan

Phase II: (3) Field survey

Phase III: (4) Data analysis in Japan

2. Method of Survey

2.1 Field Survey Programme

(1) Survey areas:

Excluding the waters inside the reef, the survey areas are as follows;

a. The waters within the 200 miles zone of Fiji as specified.

b. The waters within the 200 miles zone of Tuvalu.

(2) Period of Survey

Approximately two years: from the middle of November, 1984 to the middle of October, 1986

(3) Ship Complement

O Survey specialists from Japan, 4 persons

O Counterparts;

Both the Governments of FIji and Tuvalu shall, at their own expense, provide the survey team with counterpart personnel in close cooperation with other agencies concerned, if necessary.

The necessary arrangement for accommodation, comfort and security for them when on board shall be made by the respective Governments.

O Regular crew of the survey vessel; 21 persons
(Fiji : 4 persons
Tuvalu : 17 persons)

(4) Survey vessel

"TE TAUTAI"

(5) Base for the survey vessel

Levuka and Suva in Fiji

(6) Fishing gear, fishing method, etc.

Fishing gears and methods should be selected according to seasons and sea conditions.

a. drift gill net
b. pole and line
c. long line
d, dropline
e. trolling
f. payaos

Fishing gears and methods to be adopted after June, 1985 will be discussed in the Joint Committee to be held in March 1985

(7) Survey items

a.Experimental Fishing

The trial fishings shall be undertaken using respective fishing gear and method.

i drift gill net

- Maximum length of the nets to be set shall be 2,000 m. The trial fishing shall be performed with various mesh and net depth.

- Principally, the nets shall be set soon after the sun sets, and be hauled up about 3 - 5 hours later.

- It takes about thirty minutes to cast the nets and 3 - 4 hours to haul the nets. It, however, depends on the crew's degree of experience.

ii pole and line

- The major purpose is to evaluate the fishing grounds in the vicinity of the seamount which is to be discovered in this survey.

iii long-line

- Standard number of basket of long-lines shall be 50 - 100.

- The lines shall be set before the sun rise and be hauled 4 - 5 hours later.

- It will take 2 hours to pay out the line and 8 hours to retrieve the line of the above-mentioned quantity.

iv dropline

- The lines shall be set at the sea bed of the depth from 100 m to 400 m.

v troll

- Four lines shall be towed from two poles which are rigged on both sides of the stern deck.

- The lines shall be retrieved by a samll line hauler.

b. Fishing ground environment survey

i bottom topography survey

O This survey shall be undertaken by the echo sounder on the survey vessel "TE TAUTAI" in as large area as possible in parallel with the trial fishing.

ii oceanographic survey

O Water temperature at and below surface of the sea shall be measured using X-BT.

C. Biological survey

Length and weight measurement for major fishes, examination of sex ratio, gonad weight, contents of stomatches, etc.

d. Evaluation of the effect of payao

When unknown seamount is discovered in the survey area, payao shall be set up in consideration of regionality of its sea area.

(Maximum quantity of payaos untill March 1985 shall be twenty (20) units).

(8) Programme for the survey

A : Background

a. Meteorological and oceanographic condition

i Weather conditions of Fiji and of its surrounding sea area

O The season from July to October, is under the effect of south-east trade wind, the velocity of which becomes 5 - 6 points. Temperature of the surface sea water drops to around 25°C.

O From December to April, the northerly wind of 2 - 3 points blow. In this season, fishing operation seems to be dangerous because of big swells at the coastal zone in the north-west of Fiji. In addition to it, there are few natural good ports for sheltering from cyclones and cylone forecast is apt to be behind time because cyclones are born near this area.

ii Weather conditions of Tuvalu and of surrounding sea area.

O Weather conditions are comparatively stable because of Tuvalu's location in a lower latitude.

b. Grouping of seamounts

Fiji and Tuvalu consist of a large number of atolls and, probably, there are un-identified seamounts in this area.

The survey area within 200 miles of Fiji and Tuvalu should be divided into the following six groups subject to existing data when the systematic survey is undertaken.

- Lau Ridge
- Kandavu area
- Yasawa area
- Rotuma area
- Niulakita area
- Funafuti area

B: Decision of the survey operation programme

Indicated in the survey operation diagram attached.

(10) Communication system

Periodical communication system shall be set up between the survey vessel and IKA corporation, and the result of fishing operation shall be reported through wireless. IKA corporation is supposed to inform the Fiji and the Tuvalu Governments and JICA survey Team of the reports.

(11) Survey report

Operation reports of the respective survey period shall be submitted to each government when each survey cruise is completed. Furthermore, progress of the survey shall be reported to the joint committee.

2.2.1 Conversion of Survey Vessel

The conversion of the survey vessel will be undertaken by the consulting firm (Hohsui Corporation) which has been nominated by Japan International Cooperation Agency.

2.3 Fishing Gear and Instrument necessary for Survey

Gears and necessary equipments shall be prepared by JICA.

3. Personnel arrangement

3.1 Members of field survey team from Japan

O Team Leader

General Fisheries and Resources Analysis, and Finance	Tsutae Sato

O Sub-Leader

Fisheries and Resources Analysis	Hitoshi Mizokoshi

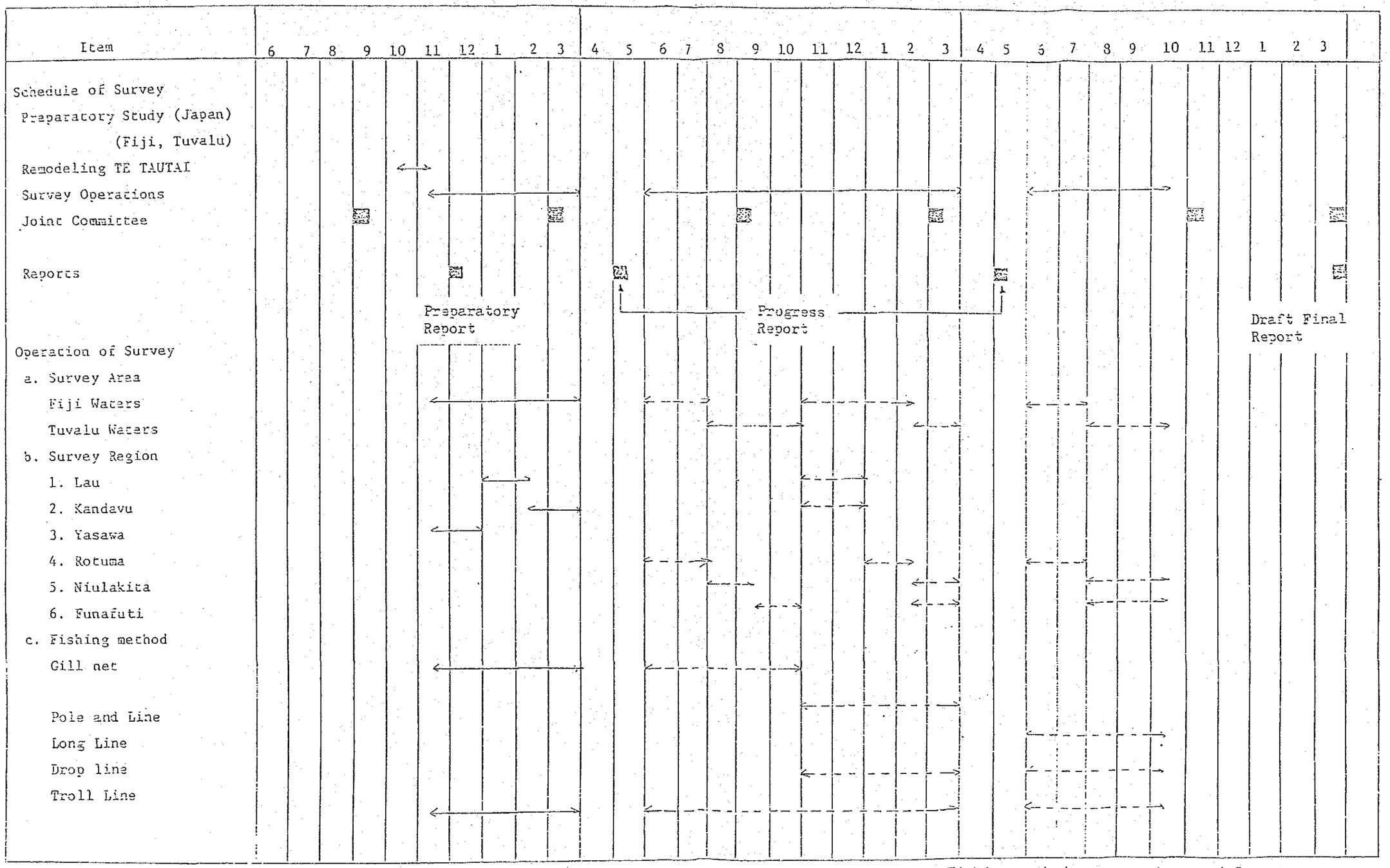
O Members

Fishing and Vessel Operation	Misao Yokoyama
Marine Engineering	Yukihiro Monma

3.2 Personnel programme

Refer to the attachment

Tentative Survey Operations Diagram



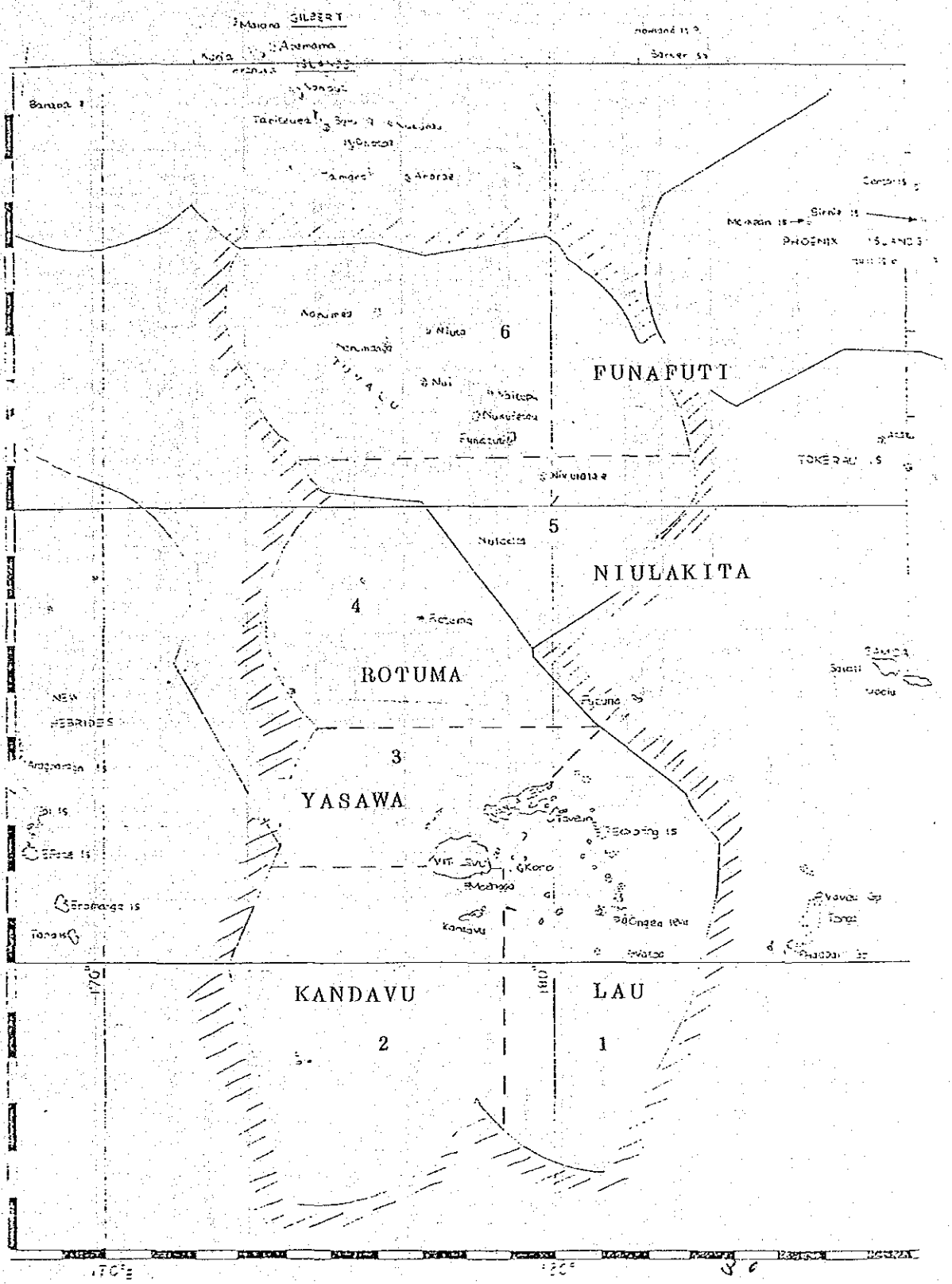
Fishing methods, survey Area and Survey Region indicated by dashed lines are tentative

フィジー国ツバル国　２００海浬図

調　査　海域区分図

FIJI & TUVALU

200 MILE FISHERIES ZONE



Attached sheet

Monthly Work Schedule of Suvey Staff

Staff NAME \ Year Month	1984						1985						1986						1987					
	4	6	8	10	12	2	4	6	8	10	12	2	4	6	8	10	12	2	4	6	8	10	12	2
TSUTAE SATO Team leader Fisheries in General Analysis of fishery resourees																								
HITOSHI HIZOKOSHI Aniskank leader of field Survey Fisheries in General Analysis of fishery resourees																								
MISAO YOKOYAMA Fishing operation of the vessel																								
YUKIHIRA MONMA Marine engine and fishing material																								

SCOPE OF WORK

FOR

THE FISHERIES RESOURCES SURVEY

IN

FIJI AND TUVALU

AGREED UPON AMONG

THE GOVERNMENT OF FIJI, AND THE GOVERNMENT OF TUVALU

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

26-27/10/83, Suva

I. INTRODUCTION

In response to the request of both the Governments of Fiji and Tuvalu, the Government of Japan has decided to conduct the Fisheries Resources Survey in the waters of Fiji and Tuvalu (hereinafter referred to as "the Survey"), in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programme of the Government of Japan, will undertake the Survey, in close cooperation with the authorities concerned of both the Governments.

The present document sets forth the Scope of Work with regard to above mentioned survey.

II. OBJECTIVES OF THE SURVEY

The objectives of the Survey are:

1. to obtain information on offshore fisheries resources with particular reference to sea mounts.

2. to attempt to identify economic fishing methods for the catching of the above fisheries resources.

III. SCOPE OF THE SURVEY

1. Survey Areas:

   Excluding the waters inside the reef, the Survey areas are as follows:

   (1) The waters within the 200 mile zone of Fiji as specified.
   (2) The waters within the 200 mile zone of Tuvalu.

2. Base Ports:

   Suva and Levuka

3. Survey Vessel:

"Te-Tautai" provided by the Government of Tuvalu.

4. Contents of the Survey:

The survey will comprise the following three phases:

(1) Phase 1: Preparatory study and analysis of the existing data, and formulation of the Survey programme to be carried out in Phase 2.

(a) to analyse all available catch data of fisheries past and present and meterological and oceanographic data within the Survey areas.

(b) to formulate the Survey programme of Phase 2.

(2) Phase 2: Collection of the following data obtained by the operation of the survey vessel:

(a) the catch data by various kinds of fishing methods
(b) the data on distribution and conditions of fish schools.
(c) the data on meterological and oceanographic conditions
(d) morphological and biological characteristics of individual sea mounts.

(3) Phase 3: Analysis of data: To analyse of all the data obtained in Phase 1 and 2 in order to clarify the following items:

(a) general distribution and abundance of offshore fisheries resources notably those associated with seamounts.

(b) seasonal and annual fluctuations in the resources.

(c) economic fishing methods.

5. Disposal of the Fish Catch

All fish caught in the course of the operation of the survey vessel, except those which may be needed for scientific studies, shall be handed over to Ika Corporation for disposal on behalf of the Governments of Fiji and Tuvalu.

IV SCHEDULE OF THE SURVEY

The survey will be executed in accordance with the schedule as shown in Appendix 1.

V. REPORTS

JICA will prepare and submit the following reports in English to the Governments of Fiji and Tuvalu respectively.

1. Preparatory Report: Twenty (20) copies within one (1) month after completion of the Survey of Phase 1.

2. Progress Report: Twenty (20) copies by the end of April every year during the period of Phase 2.

3. Draft Final Report: Twenty (20) copies within one (1) month after completion of the Survey of Phase 3.

   The Governments of Fiji and Tuvalu are each requested to submit comments on the draft final report to JICA within one (1) month of the receipt of the above report.

4. Final Report: Fifty (50) copies within two (2) months after the receipt of the comments.

5. Distribution of the final report shall be restricted to the Governments of Fiji, Tuvalu and Japan, other than by mutual agreement.

VI. UNDERTAKINGS OF THE GOVERNMENTS OF FIJI AND TUVALU

1. To facilitate smooth implementation of the Survey, both the Government of Fiji and Tuvalu will take necessary measures:

(1) to secure the safety of the survey team

(2) to permit the members of the survey team to enter, leave and sojourn in both Fiji and Tuvalu for the duration of their assignment therein, and exempt them from alien registration requirements and consular fees.

(3) to exempt the members of the survey team from taxes, duties and other charges on equipment, machinery and other materials brought into both Fiji and Tuvalu for the implementation of the Survey.

(4) to exempt the members of the survey team from income tax and other charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese survey team for their services in connection with implementation of the Survey.

(5) to provide the necessary facilities to the survey team for the remittances as well as utilization of funds introduced into both Fiji and Tuvalu from Japan in connection with the implementation of the Survey.

(6) to provide medical services as needed and its expenses will be chargeable on the members of the survey team.,

(7) to secure permission to take copies of all data and documents related to the Survey (including Photographs) out of both Fiji and Tuvalu to Japan by the survey team.

(8) to provide effective means of communication to and from the survey vessel.

(9) to provide adequate mooring sites for the survey vessel, and to take necessary measures for its safeguard.

(10) to take necessary arrangements for supplying water, fuel, foodstuff, etc, to the survey vessel.

(11) to show the coverage area in 200 mile zone.

(12) to make best efforts to secure access to bait fishing grounds.

2. Both the Governments of Fiji and Tuvalu shall bear claims, if any arise against the members of the survey team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Survey, except when such claims arise from gross negligence or wilful misconduct on the part of the members of the survey team.

3. The Fisheries Division of Ministry of Agriculture and Fisheries of Fiji and Fisheries Division of Ministry of Commerce & Natural Resources of Tuvalu shall act as counterpart agencies to the survey team and also as coordinating bodies in relation with other governmental and non-governmental organisations concerned for the smooth implementation of the Survey.

4. The respective Governments shall, at their own expense, provide the survey team with the following, in cooperation with other agencies concerned, if necessary:

   (1) available data and information related to the Survey

   (2) counterpart personnel

   (3) credentials or identification cards

5. The Government of Fiji shall, at its own expense, provide suitable office space in Suva.

6. The Government of Tuvalu shall take necessary measures to provide the survey team with the vessel "Te-Tautai" as the survey vessel free of charge.

7. The Government of Tuvalu and the Government of Fiji shall take measures to provide crew members for the survey vessel.

8. The Government of Fiji shall make its best efforts to facilitate efficient landing of the fish catch of the survey vessel.

VII. UNDERTAKINGS OF THE GOVERNMENT OF JAPAN

For the implementation of the Survey, the Government of Japan will, through JICA, take necessary measures:

1. to dispatch, at its own expense, survey teams to both Fiji and Tuvalu.

2. to pursue transfer of effective technology to both Fiji and Tuvalu counterpart personnel in the course of the Survey.

3. to provide the following equipment and supplies for the implementation of the Survey, which will remain the property of the Government of Japan unless otherwise agreed upon:

(1) fishing gear and equipment necessary for trial fishing.

(2) equipment and machinery for meterological and oceanographic observations.

4. to convert "Te-Tautai" if necessary, into a suitable vessel for the survey purposes as determined by the joint committee and with the approval of the Government of Tuvalu.

5. to bear the necessary costs to operate the survey vessel including the above conversion costs.

VIII. JOINT COMMITTEE

For the successful and the smooth implementation of the Survey, a joint committee will be established as a coordinating body composed of the representatives from Fiji, Tuvalu and JICA.

(1) The committee's functions are:

(a) to discuss and approve the Survey programme

b) to review the progress of the Survey

c) to recommend to the respective Governments the further necessary requirements for the successful implementation of the Survey.

(2) The chairman of the committee is the Permanent Secretary for Agriculture and Fisheries of Fiji or his nominee.

(3) The members of the committee consist of the nominees of the Governments of Fiji and Tuvalu and representatives of JICA.

(4) Officials of the Embassy of Japan may attend the meeting of the joint committee as observers.

(5) The committee meeting will be held at least twice during each annual period from April to March.

IX. JICA, the Government of Fiji and the Government of Tuvalu will consult with each other in respect of any matter that may arise from or in connection with the Survey.

Appendix 1

TENTATIVE SCHEDULE

Fiscal Year	1984						1985						1986						1987				
Month	4	6	8	10	12	2	4	6	8	10	12	2	4	6	8	10	12	2	4	6	8	10	12
Phase 1																							
Phase 2																							
Phase 3																							
Report																							
Mission																							

Minutes of Discussions

on

Scope of Work

for

The Fisheries Resources Survey in FIJI and TUVALU

In response to the request made by both the Governments of Fiji and Tuvalu, the survey team was dispatched by the Government of Japan, through the Japan International Cooperation Agency (JICA) to confirm the Scope of Work for the Fisheries Resources Survey in Fiji and Tuvalu.

The survey team held a series of discussions on the Scope of Wrok with the Fisheries Division, Ministry of Agriculture and Fisheries, of the Government of Fiji and Fisheries Division, Ministry of Commerce and Natural Resources of the Government of Tuvalu.

The meeting was held on 26th and 27th October 1983. A list of participants at the meeting is attached. The main items agreed were as follows:

1. According to area and season, appropriate survey fishing methods shall be selected from amoggst pole and line, drift gill net, dropline, longline and trolling. Concerning gill netting, the maximum length of net to be used shall be 2000m. However the Fiji and Tuvalu Governments expressed concern about this restriction and requested that the Joint Committee review results of gill netting after the first six months of the Survey, and plan the second year's work accordingly. The need to have adequate replacement stocks of gill nets readily available and to use various mesh sizes was recognised.

2. In recognition of the increasingly valuable role of payaos in pelagic fisheries, the Survey would deploy a number of these in both offshore and nearshore areas. This would provide important comparative data and was felt to be the best means for the survey to promote small scale fisheries outside the reef.

3. The necessary costs to operate the vessel are as specified in the attached sheet. Among them, the costs mentioned in item 3, 5 and 6 will be payable to the National Fishing Corporation of Tuvalu.

4. As to the usage of the vessel "Te-Tautai", a contract shall be concluded between consultant firm designated by JICA and the Government of Tuvalu.

5. Upon completion of the survey of Phase 2, JICA and the excuting organ of the Government of Tuvalu will consult with each other, whether or not it is necessary to remodel the vessel "Te-Tautai" into its original structure. JICA will bear the remodelling costs if the Government of Tuvalu deems it necessary to do so.

6. The expenses of the Joint Committee should be shared by the Government of Fiji, the Government of Tuvalu and JICA and respective proportions will be determined at the first meeting of the Joint Committee.

Peter C. Hunt

Dr P. C. Hunt
Chief Fisheries Officer
Fisheries Division,
Government of Fiji.

K. Logati
High Commissioner to Fiji
Government of Tuvalu.

三村皓哉

Koya Mimura,
Team Leader,
Japanese Survey Team,
Japan International Cooperation Agency

MEMORANDUM OF UNDERSTANDING

(Disposal of Fish Catch)

The fish caught by the survey vessel in the course of the trial fishing operation in the waters of Fiji and Tuvalu under JICA Fisheries Resources Survey programme shall be disposed of as follows:-

1. As to the disposal of the fish catch, the Ika Corporation shall act as representative of the executing organs of both the Government of Fiji and Tuvalu.

2. The chief researcher of the survey vessel shall inform the representative, of the details of the fish catch of each fishing operation prior to his return to port.

3. Based upon the above information, the representative shall give necessary instructions to the chief researcher, about the port for landing and the agency to hand over the fish caught.

4. The chief researcher shall hand over the fish caught to the designated agency in accordance with the above instructions.

5. JICA will submit to the Fisheries Divisions of Fiji and Tuvalu the documents, containing the details on fishing date or period, fishing areas, fishing methods used, species of fish and quantities of fish caught in every trial fishing operation within one month after completion of each cruise for the fishing operation.

6. JICA's duty and responsibility concerning disposal of fish caught are limited to the matters indicated in the above item 2, 4 and 5.

7. Both the Governments of Fiji and Tuvalu will be fully responsible for distribution of the fish caught. The two Governments should therefore consult with each other on the matter for its final decision.

JICA will not share any responsibility for the matter.

October 1983.

Dr. P. C. Hunt
Chief Fisheries Officer
Fisheries Division
Government of Fiji.

K. Lopati
High Commissioner to Fiji
Government of Tuvalu.

Mr. Koya Mimura
Team Leader,
Japanese Survey Team
Japan International Cooperation
Agency.

Attached sheet

The necessary costs to operate the survey vessel are as follows;

1. Crew's wage and allowance, including social insurance charge if necessary
2. Crew's food charge
3. Regular maintenance & repairing costs of the vessel
4. Consumable goods
5. Insurance premium for the vessel
6. Management costs for the vessel
   (The necessary management costs to be covered by the Government of Tuvalu on a regular basis)
7. Fuel
8. Lubricating oil
9. Crew's travelling expenses between Tuvalu and Fiji during the survey period
10. Agent fee
11. Crew's accomodation charge in Land, if necessary while mooring the vessel at the port of Fiji

LIST OF PARTICIPANTS

Govt. of Tuvalu:

H.E. Kitiseni Lopati	Tuvalu High Commissioner to Fiji.
Mr. David Schupp	Finance Director, Naficot
Mr. Michael Batty	Fisheries Adviser, Fisheries Division.

JICA:

Mr. Koya Mimura	Leader of the Japanese Survey Team.
Mr. Yasuhiko Saeki	Chief, Fisheries Technical Cooperations Division, JICA.

Govt. of Fiji:

Dr. P. C. Hunt	Chief Fisheries Officer, Fisheries Division.
Dr. A.D.Lewis	Principal Fisheries Officer Fisheries Division.
Mr. S. Sewak	Senior Fisheries Officer, Fisheries Division
Mr. M.McGregor	General Manager, Ika Corporation

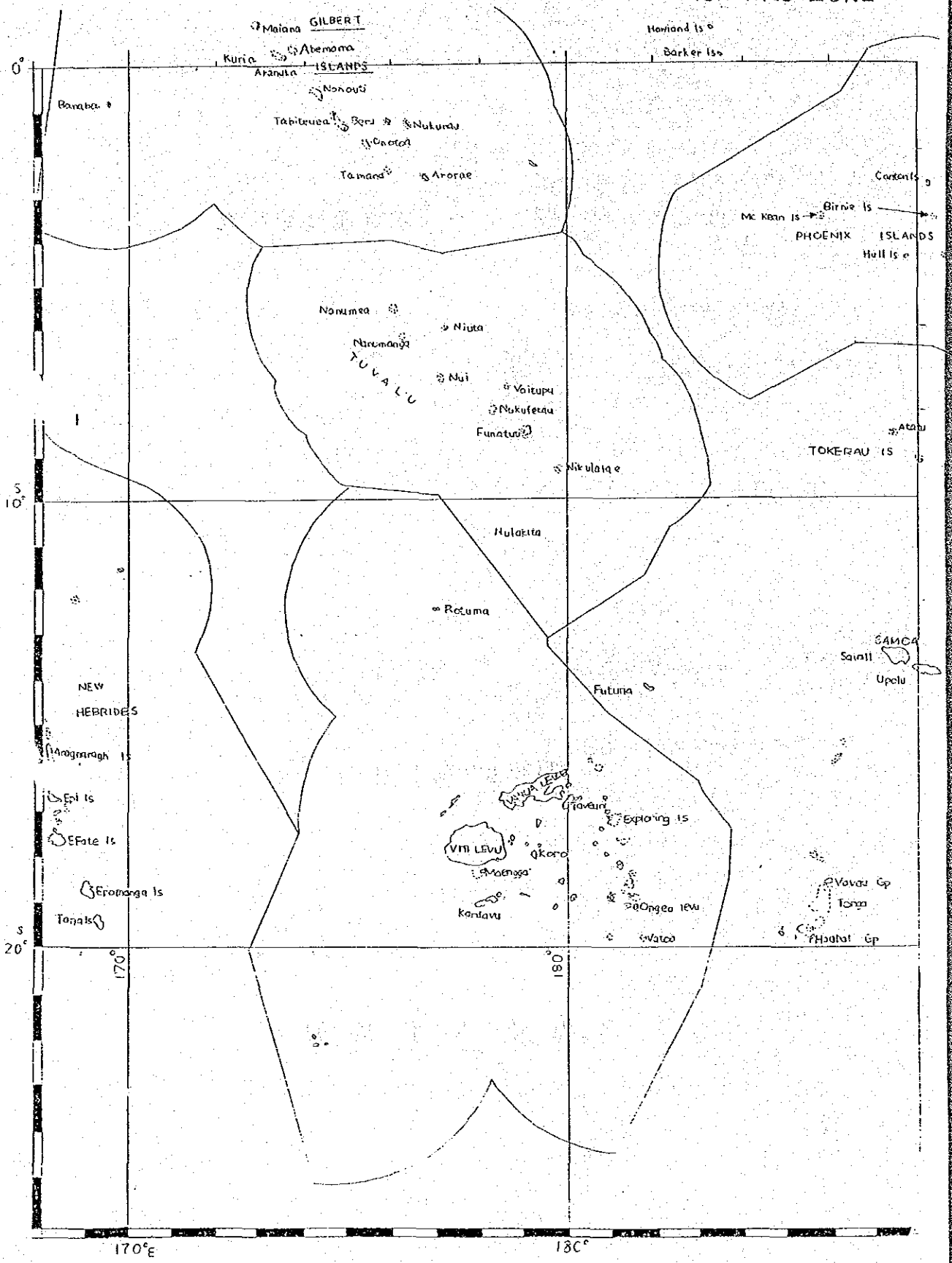
(2) フィジー国、ツバル国水産資源調査

計　画　書

昭和59年9月

国際協力事業団

FIJI & TUVALU
200 MILE FISHERIES ZONE



目　　次

1. 序　文

1.1　調査の背景

フィジー、ツバル両国の鰹漁業は重要な産業となっている。この漁法として生餌を必要とするかつお一本釣漁法がフィジー水域で１９７５年より、ツバル水域では１９８０年に行なわれた実績がある。しかしながら、この経験では年間通して生餌の入手の不安定が判明し、同漁業で大きな問題となっている。このため一本釣漁法によって経済性が失なわれる時期に浮魚を対象とする適切な漁獲方法により漁業の発展をはかるべく釣漁法以外に刺網などの試験操業をフィジー、ツバル両国より我が国に要請してきたものである。

1.2　調査の目的

フィジー、ツバル両国の要請に基づき、沖合の海山周辺及び沖合の海域における漁業資源に関する情報収集とこれらの漁業資源を捕獲する経済的な漁法を確認することを目的とする。

1.3　総合スケジュール

調査の期間は昭和５９年７月から昭和６２年３月までで、その期間は３段階から成る。

第１段階

(1)　国内準備調査

(2)　現地準備調査

a　調査計画、現地打合せ

b　調査船改造

c　国内解析

第２段階

(3)　洋上調査

第３段階

(4)　国内解析調査

2.　調査の実施方法

2.1　洋上調査計画

(1)　調査の目的

a　沖合の海山周辺及び沖合の海域における漁業資源に関する情報収集。

b　上記漁業資源を捕獲するに当たり経済的な漁法を確認すること。

(2) 調査海域

a フィジー国２００海浬海域として指定された海域

b ツバル国２００海浬海域内

(3) 調査期間

１９８４年１１月中旬～１９８６年１０月中旬　２年間

(4) 乗組員編成

調査員　４名

カウンターパート（カウンターパートについて、その乗船中の居住と安全、手当、その他一切はフィジー、ツバル両国の責任において行うもので日本側は関知しない）

固有船員２１名

(5) 調査船　テ・タウタイ号

(6) 調査船基地　フィジー国　スバ、レブカ

(7) 漁具漁法等

漁具漁法については、季節および海況により適正な漁法を選択する。

a 流刺網漁法

b 一本釣漁法

c 延縄漁法

d 立縄漁法

e 曳縄漁法

f その他　バヤオの設置（１９８５年３月まで最大２０基とする）

１９８５年３月の合同委員会で１９８５年６月以降の漁具漁法を検討するが、流刺網、一本釣、延縄漁具は次の理由により同時に使用することは出来ない。

(i) 各漁法ごとに漁撈機器が異る。

(ii) 漁法を転換するには、その度びごとに作業甲板の改造が必要である。

なお、漁撈機器の交換及び作業甲板の改造には、時間を要するので、上記各漁法を短期間の操業で交代させることは、調査効率が極度に低下するので行うべきでない。

(8) 調査項目

a) 漁獲試験調査

漁具漁法別に漁獲試験を行う。

(i) 流刺網

・ 投網は最大2,０００メートルとし、網目、網丈別の試験操業をする。

・ 日没と同時に投網し、約３～５時間漂泊後、揚網を原則とする。

・　一般には投網時間約３０分、揚網時間３～４時間であるが、乗組員の練度により異なる。

網の長さについては当面２０００メートルとするが、１９８５年３月までの調査の結果をみて必要であれば日本の規制の範囲で変更の可能性を検討するものとする。

(ii)　一本釣

新たに発見した海山の漁場価値を調査することを主目的とする。

(iii)　延　縄

・　投縄数５０～１００枚を目安とする。

・　日の出前に投縄し、４～５時間待機後揚縄を原則とする。

・　投縄約２時間、揚縄約８時間

(iv)　立　縄

・　水深１００～４００ｍに設置する。

・　投入数は状況に応じて決定する。

(v)　曳　縄

・　船尾両舷に２本の竿を立て、４本の曳縄を投入する。

・　小型巻き取り機で取り込む。

b）漁場環境調査

(i)　気象・海況調査

(ii)　海底地形調査

試験操業と平行して、テ・タウタイ号に備えてある魚探を使用して出来るだけ広範囲に行う。

(iii)　海洋調査

表層水温のほか、中層水温をＸ・Ｂ・Ｔで観測する（水深４５０ｍ）。

c）生物調査

主要魚種について、体長、体重を測定し、性比、性殖腺重量・胃の内容物等を調査する。

d）パヤオの設置効果

調査海域で新たに海山を発見した場合、その地域性を考慮して設置する（但し１９８５年３月まで最大２０基とする）。

(9)　洋上調査実施計画

A　背景条件

a　気象海況

(i)　フィジー国及び周辺海域の気象

・　７月～１０月は南東季節風時期に当り風力５～６と強い。

表面水温は２５℃位まで低下する。

・　１２月～４月は風力２～３の北寄りの風が吹く。

この時期はサイクロンが発生する。このシーズン中フィジー国北西側近海ではウネリが大きく操業が危険となることが予想される。又、この海域はサイクロンを避ける自然の良港が少ない。サイクロン発生場所が近いための予報が遅れる。

(ii)　ツバル国周辺海域の気象

・　低緯度に位置するので気象は比較的安定している。

b　海山のグルーピング

フィジー、ツバルの両国は多数の環礁からなっており、まだ未確認の海山が存在すると考えられる。

海山の発見には、海底地形図を参照にするが、フィジー、ツバル両国２００海浬内は従来知られているData からみて系統的に調査する場合は、次の６グループに区分すべきである。

・　LAU RIDGE
・　KANDAVU AREA
・　YASAWA AREA
・　ROTUMA AREA
・　NIULAKITA AREA
・　FUNAFUTI AREA

B　Survey Operation Programme の決定

別図　Survey Operation Diagram に示す。

(10)　連絡体制

調査船は、ＩＫＡ公社と定時連絡を設け操業報告を無線で行う。

ＩＫＡ公社は、これを両国政府及びコンサルタント社に連絡するものとする。

(11)　調査の報告

航海の終了毎に調査期間の操業報告書を、それぞれの政府に提出する。

更に、調査の進捗状況は合同委員会に報告する。

2.2　調査船の改造

調査船の改造は、国際協力事業団が指定したコンサルタント社（株式会社ホウスイ）が実施する。

2.3　調査に必要な資機材

調査に必要な漁撈及び海洋観測機材、漁具を手配する。

3.　要員計画

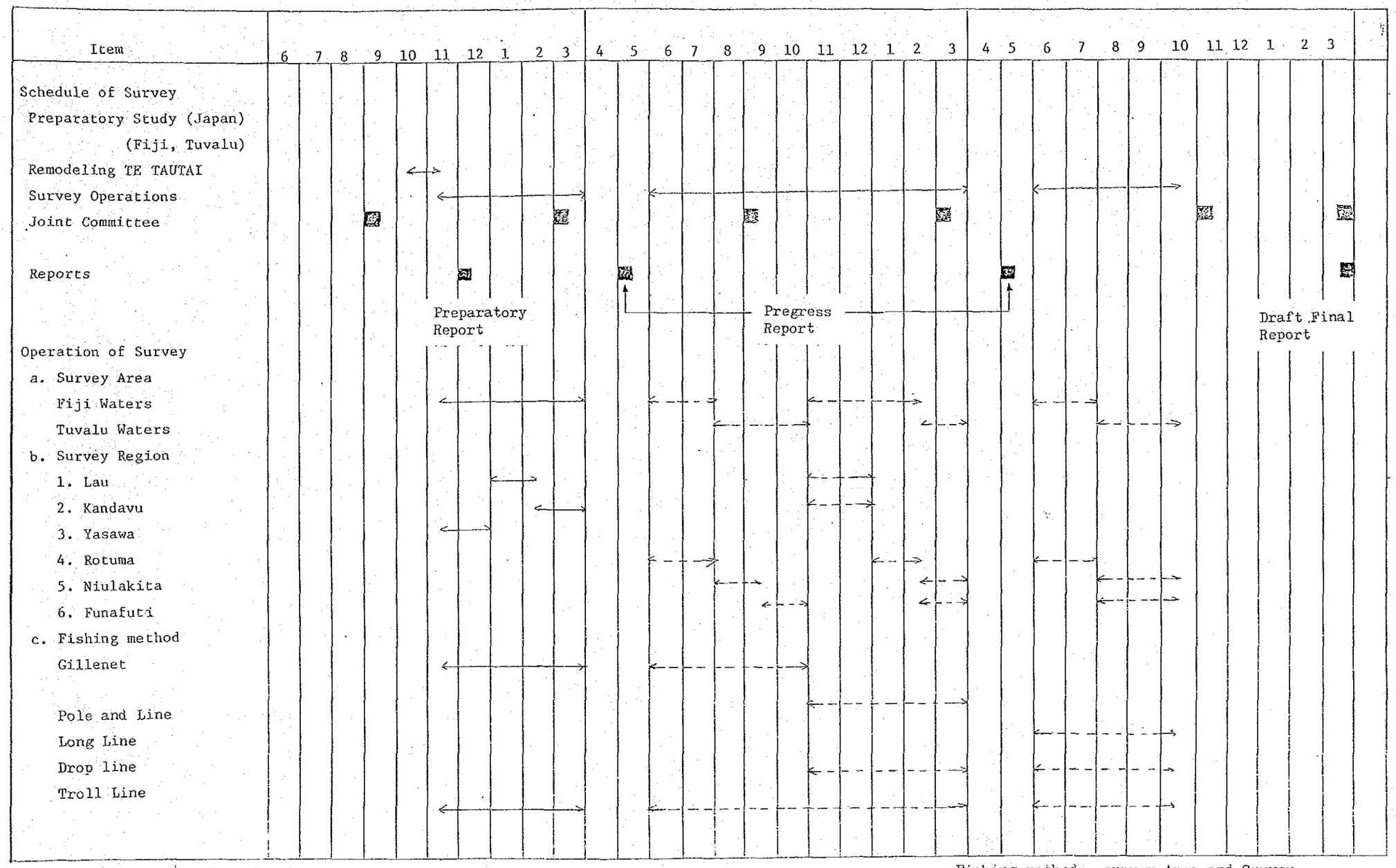
3.1　現地派遣調査員

総括責任者	漁業全般・資源解析及び財務	佐藤　傳
副責任者	漁業一般及び資源解析	溝越　均
	漁撈及び船舶運航	横山　操
	漁船機関	門間幸弘

3.2　調査人月表

別表参照

Tentative Survey Operations Diagram



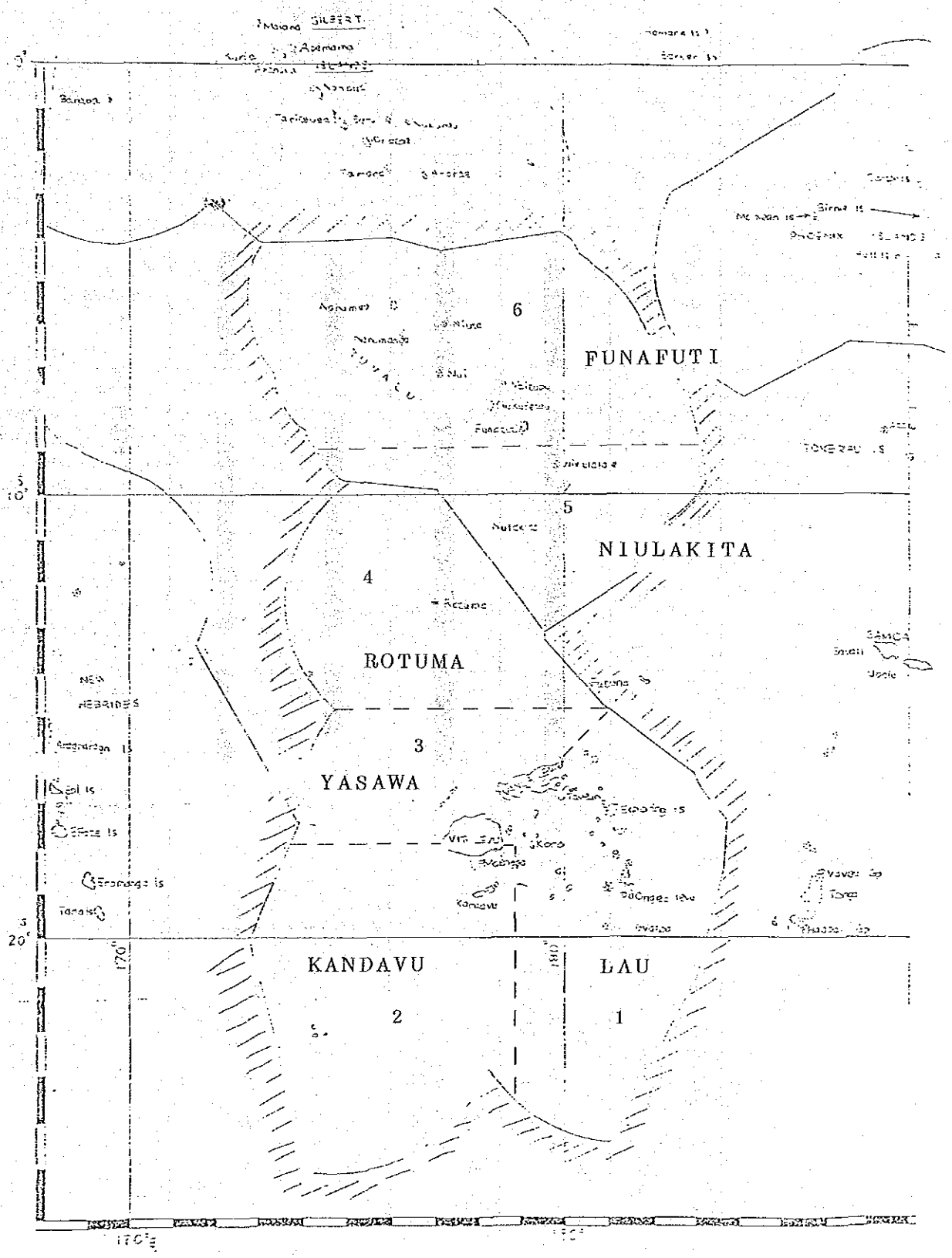
Fishing methods, survey Area and Survey Region indicated by dashed lines are tentative

フィジー国トゥバル国　200海哩図

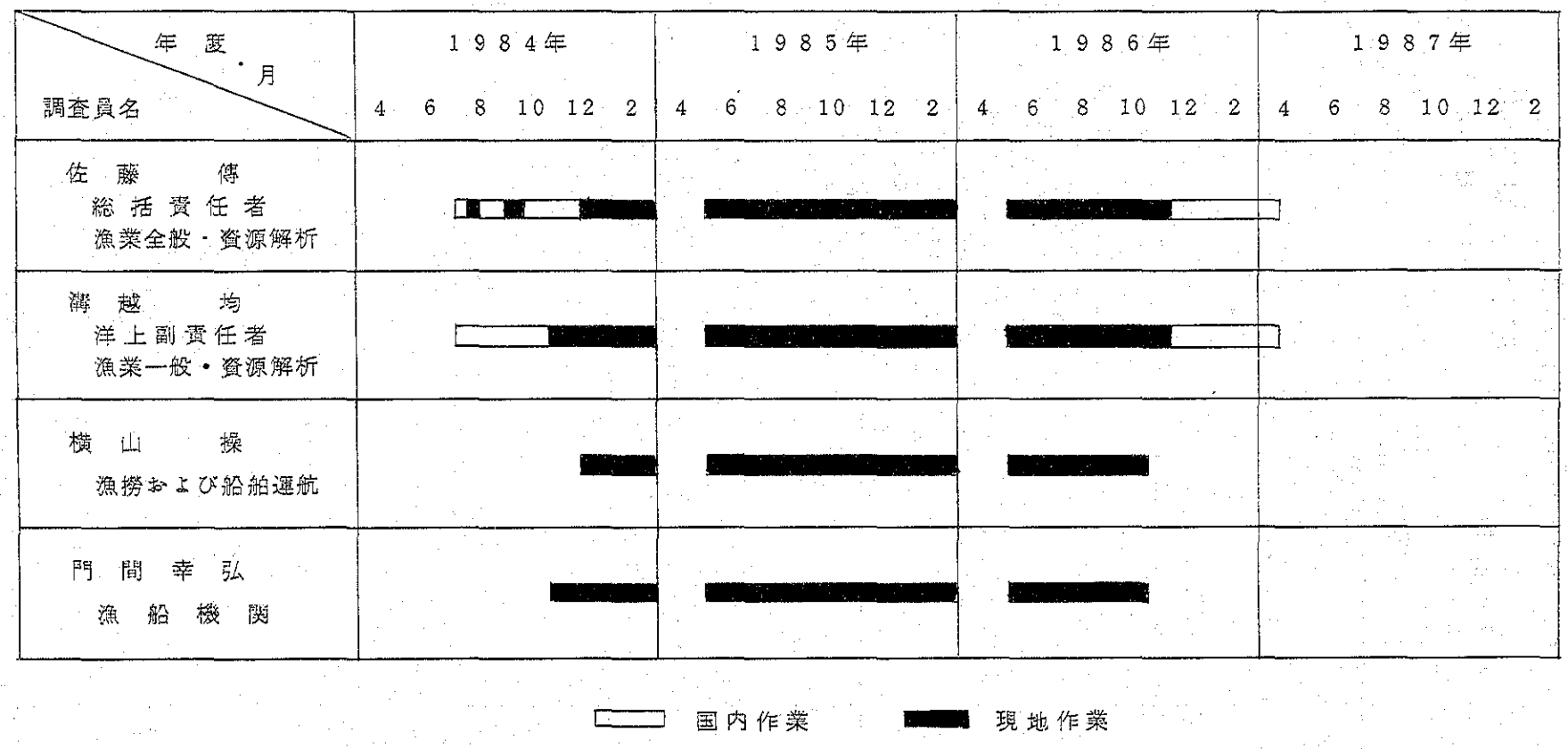
調　査　海域区分図

FIJI & TUVALU

200 MILE FISHERIES ZONE



要員計画・調査人月表


年度・月
調査員名
1984年
1985年
1986年
1987年
4 6 8 10 12 2
佐藤 傳
総括責任者
漁業全般・資源解析
溝越 均
洋上副責任者
漁業一般・資源解析
横山 操
漁撈および船舶運航
門間幸弘
漁船機関
国内作業
現地作業

Ⅶ. 合同委員会の議事録（英文）

MINUTES OF THE FIRST JOINT COMMITTEE MEETING ON THE FISHERY RESOURCES SURVEY IN FIJI AND TUVALU

The first Joint Committee Meeting was convened at JICA Office on 5th September, 1984 under the Chairmanship of Dr. A.D.Lewis, the nominee of the Permanent Secretary for Primary Industry of the Fiji Government.

The main purpose of this meeting was to discuss and approve the programme of the survey of fishery resources in Fiji and Tuvalu, proposed by JICA, including objectives of the survey, scope of the survey, undertaking of Fiji, Tuvalu and Japanese Governments and further necessary matters related to the survey based upon the Scope of the Work, and the Minutes of Discussion on the above Scope of Work signed in October 1983.

After intensive discussion among representatives of both the Governments of Fiji and Tuvalu, and JICA, the survey programme for a period from November 1984 to March 1985, was formulated and approved. A tentative survey programme was approved as a basis for planning for the period beyond June 1985, but the need for flexibility was noted, and it was agreed that details would be finalised at the next Joint Committee Meeting, in the light of experiences of the first six months.

In addition, the Joint Committee approved remodelling of the survey vessel "Te-Tautai". Details of the discussion, understanding and confirmation are described in the attached memorandum:

1.	PROJECT	:	THE FISHERIES RESOURCES SURVEY IN FIJI AND TUVALU
2.	DATE	:	5TH AND 6TH SEPTEMBER, 1984
3.	PLACE	:	JICA OFFICE, SUVA
4.	SUBJECT	:	DISCUSSION OF THE FISHERY RESOURCES SURVEY IN FIJI AND TUVALU
5.	PARTICIPANTS	:	

大鶴典之

(1)

(a) The Government Of Fiji

Ratu Tui S. Cavuilati	-	Acting Chief Fisheries Officer
Dr. A.D. Lewis	-	Principal Fisheries Officer
Mr M. McGregor	-	General Manager - Ika Corporation

(b) The Government Of Tuvalu

Mr M.J.Batty	-	Fisheries Adviser - Tuvalu Government

(c) JICA Team

Mr Norio Otsuru	Leader	Adviser Japan Marine Fishery Resources Research Center
Dr Keiichiro Mori	Survey Planning	Senior Scientist Development Department Japan Marine Fishery Resources Research Center
Mr. Keiki Iisuka	Resource Analysis	Head, Second Section Fisheries Resources Division Tohoku Regional Fisheries Research Laboratory
Mr Minato Yasui	Fishing Methods	Technical Officer Sizuoka Prefectural Fishery Experimental Station.
Mr Hiroshi Hashiura	Coordination	Deputy Head Fisheries Technical Cooperation Division JICA
Mr. Tsutae Satoh	Team Leader of Survey	Hohsui Corporation
Mr. Kohei Kasahara	Resource Analysis	Hohsui Corporation
Mr. Toru Kasai		Jica Resident Representative SUVA

大鶴豊光

(2)

6. MAJOR FEATURES CONFIRMED AND UNDERSTOOD

(1) The Scope of Work, its Minutes of Discussion and the Memorandum of Understanding, signed in October 1983 have been confirmed.

(2) It is important that the survey programme should be flexible. Future planning will be reviewed by the Joint Committee. Regular informal consultations should be held between the survey team and officials of the Governments of Fiji and Tuvalu.

(3) A contract for the hire of the survey vessel 'Te-Tautai' will be concluded between the National Fishing Corporation of Tuvalu and the consulting firm (Hohsui Corporation).

(4) Office space for the Survey Team will be provided free of charge by the Ika Corporation on behalf of the Fiji Government.

(5) For the initial period November 1984 to March 1985, the primary fishing method to be used will be drift gillnetting.

Mr. J. Makasiale Permanent Secretary for Primary Industries Ministry of Primary Industries The Government of Fiji	Mr. K. Lopati High Commissioner to Fiji The Government of Tuvalu	大鶴典生 Mr. Norio Otsuru Leader, JICA Advisory Committee Team for the Fisheries Resources Survey in Fiji and Tuvalu

Date: 10th September 1984

MEMORANDUM OF DISCUSSION AND CONFIRMATION

(1) Dr. A.D.Lewis of the Fiji Fisheries Department chaired the meeting. The acting Chief Fisheries Officer, Ratu Tui Cavuilati welcomed the participants on behalf of the Permanent Secretary for Primary Industry. He emphasized the importance of the survey and the gratitude of the Government of Fiji.

(2) The Leader of the J.I.C.A. team Mr. N. Otsuru presented the survey programme. He stated the importance of reaching a decision on the remodelling of the survey vessel.

(3) The meeting reviewed the survey programme document paragraph by paragraph. The following were the main points raised:

(i) The Fiji delegation again expressed concern over the limit placed on the maximum length of gillnets. The Japanese delegation explained that it would be difficult to give any commitments on this issue.

(ii) It was agreed that pole and line fishing need not be restricted to newly discovered seamounts, but could be extended to any previously unfished areas.

(iii) The Tuvalu delegate queried the number of baskets of longlines to be used. The Japanese delegation explained that this was an indicative figure, and could be increased if practicable.

(iv) The Ika Corporation Manager expressed his interest in baitfishing over seamounts.

(v) The suitability of Te-Tautai's echosounder for locating seamounts was questioned. It was agreed that the performance should be checked.

(vi) Informal discussions were scheduled to explore the details of biological survey work.

(vii) It was requested that the payaos should not be restricted to previously undiscovered seamounts. The chairman noted that it would be less effective to install payaos in locations where they could not be reached by vessels other than the survey vessel. It was therefore agreed that there would be consultations between the Survey Team and Government Officials in the location of payaos.

(viii) The Japanese delegation were unable to accept an offer to use Fiji Fisheries vessels to install payaos, since the survey budget would not provide for this. Materials for the payaos will be ordered by JICA, but the survey team would welcome advice from the Ika Corporation on the most appropriate design.

(ix) The effectiveness and feasibility of the handline method was explained by Mr Yasui. The meeting express interest in this method as a survey technique.

(x) It became clear that the base station radio was not adequate for the survey. The meeting recommended that a more powerful transceiver should be provided.

JICA