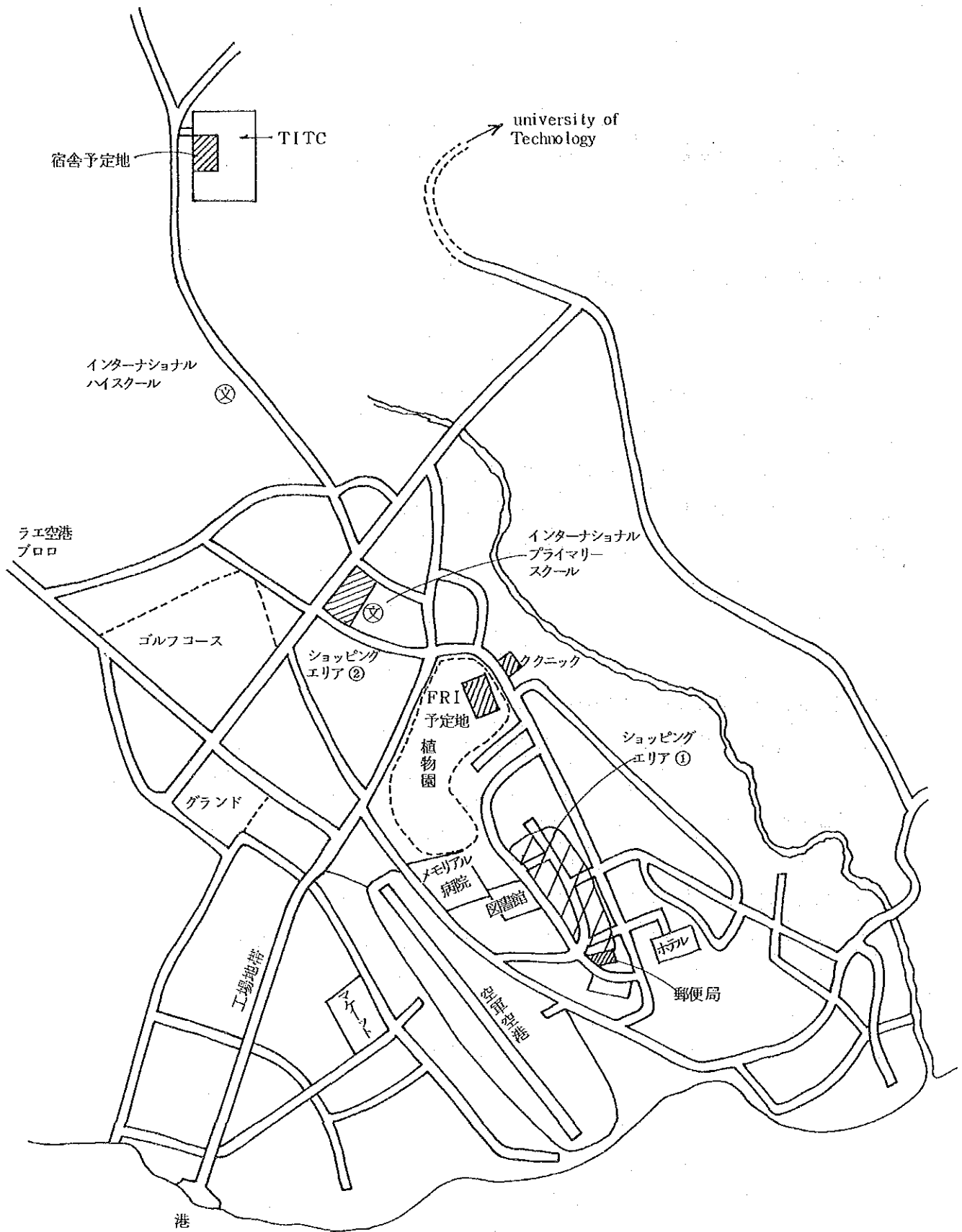
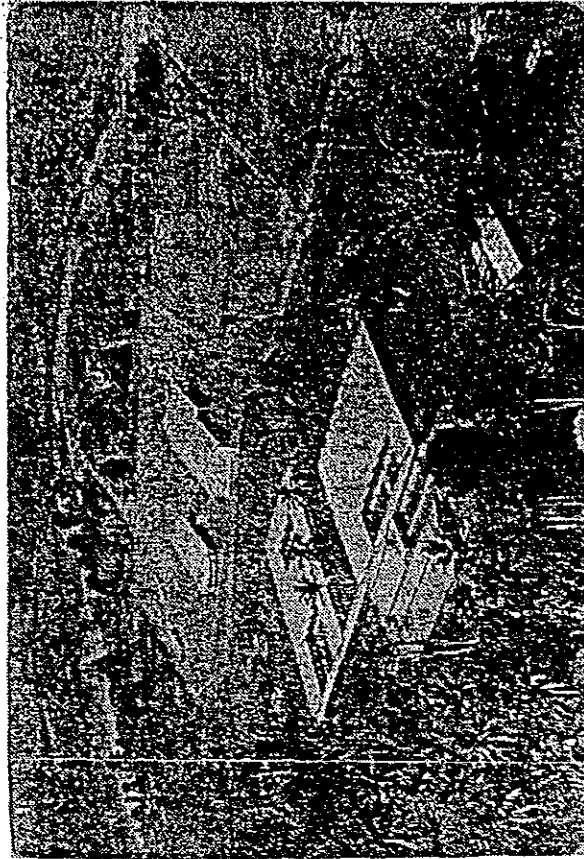


## 付 属 資 料



# TIMBER INDUSTRY TRAINING COLLEGE

COURSES 1987



LIST OF CURRENT STAFF MEMBERS  
\*\*\*\*\*

1. NON ACADEMIC STAFF

MR NATHAN SIRIGA PRINCIPAL  
MR TIKAI MITIR REGISTRAR  
MR YUSTO SALENG PURCHASING OFFICER  
MS SHELLIAN VAI SECRETARY TYPIST  
MRS MARIA MITIR MESS SUPERVISOR  
MS MIRIAM BARU LIBRARIAN

2. ACADEMIC STAFF

2.1 SAWMILL DEPARTMENT

MR KAUL TAMA - SNR INSTRUCTOR, TRADESMAN  
CERTIFICATE; ADVANCE TECHNICAL  
CERTIFICATE.

MR JONATHAN ZULUWINA - INSTRUCTOR, TRADESMAN  
CERTIFICATE.

MR TITO BILALDAY - SNR INSTRUCTOR, ADVANCE  
TECHNICAL CERTIFICATE; NZ  
ASSOC. LECT. CERTIFICATE.

DANIEL MARIKA - INSTRUCTOR, TRADESMAN  
CERTIFICATE.

2.2 SANDOCTORING DEPARTMENT

MR ELISHA JAPUCTONG - SNR INSTRUCTOR, TRADESMAN  
CERTIFICATE; ASSOC. LECT.  
CERTIFICATE.

MR LEIBAN MESIWINI - INSTRUCTOR, SPECIALIZING  
SANDSANS; ADVANCE CERTIFICATE  
NZ; ASSOC. LECT. CERTIFICATE.

MR PHILIP BAYAK - INSTRUCTOR, SPECIALIZING  
CIRCULAR SAWS; ADVANCE TECH.  
CERTIFICATE; ASSOC. LECT  
CERTIFICATE.

2.3 REMANUFACTURING DEPARTMENT

MR RISIE LELEBA - SNR INSTRUCTOR, TRADESMAN  
CERTIFICATE; ASSOC. LECT  
CERTIFICATE PATI.

VAGI LOVO - INSTRUCTOR, TRADESMAN CERT;  
ASSOC. LECT. CERTIFICATE PATI.

STEVEN PHILIP - INSTRUCTOR, TRADESMAN  
CERTIFICATE.

2.4 TIMBER UTILIZATION DEPARTMENT

MR KUPIN KAPAL - DIP FOR. BULOLO; ASSOC.  
LECT. CERTIFICATE PATI

MRS ANNA AGLUA - DIP FOR. BULOLO.

8. OTHER COURSE INFORMATION

9.1. 1987 COURSES

This year's Course Program covers about 27 Courses.

These include Pre-Employment Technical Training Course on Basic Wood Machining, Saw Doctoring, Saw Milling and Wood Preservation.

9.2. DURATION

1987 Academic year, runs from 2nd February to 4th December, 1987 i.e. PETT Course - 40 Weeks, Short Courses - vary from 2 to 6 Weeks.

9.3. THE STUDENTS

Students are drawn from two Main Sources:-

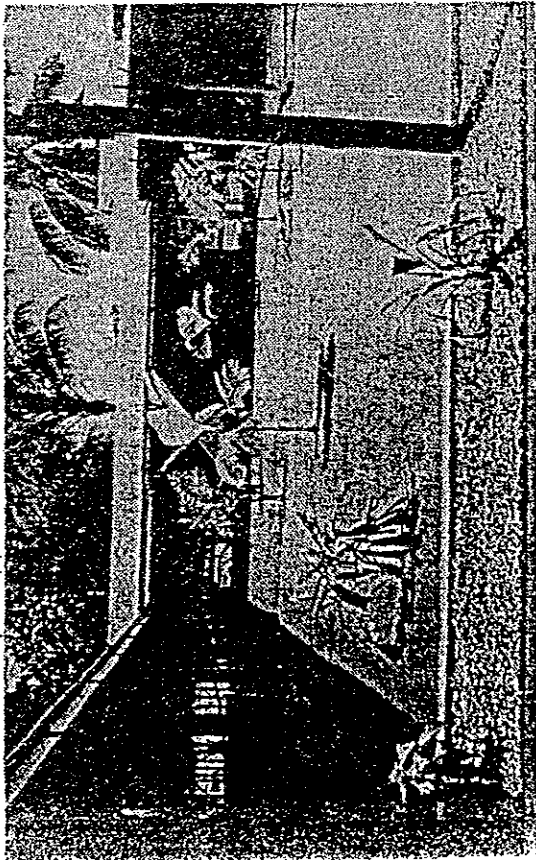
- i. Grade 10 High School Leavers to attend PETT Course
- ii. Those currently under employment can attend Short Courses and Apprentice Block Courses.

9.4. ENTRY REQUIREMENT

- (a) PETT COURSE  
Minimum Grade 10.  
With Upper Passes in Maths  
English and Passes in  
Technical Drawing & Science.
- (b) SPECIAL COURSE  
Prefer Grade 10 or High School  
Level.
- (c) SMALL SAWMILL  
Prefer applicants have some  
Formal Education. (Grades 1 or 2)

9.5. THE FEES

- (a) SHORT COURSES  
Board and Lodging K25/week and  
Tuition K25/week  
Totalling K50/week
- (b) APPRENTICE  
BLOCK COURSE  
Board & Lodging K14/week



T.I.T.C. **TIMBER INDUSTRY  
TRAINING COLLEGE**

POSTAL ADDRESS P.O. BOX 2132  
LAE, MOROBE PROVINCE

TELEPHONE 42 4600  
42 1083  
42 3886

**B. SPECIAL COURSES ON REQUESTS**

PROP. DATES	C/CODES	COURSE DETAILS	DURATION
04/05/87	TIW 502	Basic Wood Machining	2 Weeks
27/07/87	TIU 114	Basic Wood Identification	2 Weeks
05/10/87	TIU 115	Kiln Drying Course	4 Weeks
16/11/87	TIU 112	Air Seasoning Course	3 Weeks
05/10/87	TIW 640	Joinery Machinist	4 Weeks
17/08/87	TID 303	Bandmill Alignment	2 Weeks
26/10/87	TIV151	Timber Yard Management	2 Weeks
23/11/87	TIS 440	Sawmill Foreman Course	2 Weeks

\* Logging Training - Until this Training Section is formally inco-operated in the College Programme, presently this course is conducted on the site request through Forest Industries Council.

**B.1 BAND MILL ALIGNMENT AND TROUBLE SHOOTING (For Sawmillers and Sawdoctors)**

ON REQUEST

This Course covers Track and Wheel Alignment Guide System Carriage Maintenance and Repair, Band Wheel Grinding, Overhang.

INTRODUCTION

**1. BACKGROUND**

The Timber Industry Training College was established in 1978 as a joint Venture between the Papua New Guinea and New Zealand Governments, with the aim of providing a high level of training for Primary and Secondary Sector of the Timber Industry in Papua and New Guinea and other South Pacific Countries.

The facilities provided rate amongst the finest in the World for Training in the industry.

At present besides the Accommodation and Service, Lecture rooms and Library facilities there is a Modern Sawmill, Large Saw Doctoring Shop, A Wood Machining Work Shop and Several Portable Sawmills, Pressure Treatment Plant and a Dip Diffusion Plant.

The Sawmill has two Sawlines and is able to offer complete training in the Operation and Maintenance of a modern fully automated Bandmill as well as a simple completely manually operated Circular Sawmill.

The Saw Maintenance Equipment and Facilities are very complete and able to provide training in the making and maintenance of all types of saws at all levels.

The Wood Machining Work Shop is equipped with Planer Moulder Resaw and a full range of Woodworking Machinery and Grinding equipment.

The Program to provide training and technical assistance to Small Sawmills is well established and can be available to operators locally or at the College.

Presently three types of Portable Sawmills have been set up at the College for Training and Evaluation and these are being added to.

As space is available, courses are open to other Countries of the Pacific, and to date trainees had been received from Tonga, Niue, Vanuatu, Solomons Islands and Kiribati.

**2. COLLEGE AMENITIES**

**2.1 LOCATION**

The Timber Industry Training College (TITC) is built on a very pleasant site of approximately 4 hectares and about 3½ Kilometers of walking distance from main shopping centre.

7. SMALL SAWMILLS COURSES

This Course Syllabus have been standardized and the Course conducted for this year is as follows:-

2nd February	1987 - 20th February	1987 (Standard Course)
23rd March	1987 - 10th April	1987 ( " " )
8th April	1987 - 8th May	1987 ( " " )
8th June	1987 - 26th June	1987 ( " " )
20th July	1987 - 7th August	1987 ( " " )
31st August	1987 - 18th September	1987 ( " " )
16th November	1987 - 4th December	1987 (Advance Course)

The Course covers Assembly and Preparation Machine, Tree Felling, Bucking Setting up Logs, Operation, Cutting different sizes of Timber, Tallying, Maintenance, Timber Treatment, Storage Management and Marketing.

Advance Course is designed for Experienced Operators Only.

2.2 ACCOMMODATION

The College has maximum accommodation capacity of seventy students at any one time.

2.3 SPORTS

College has large (two in one) marked and regularly maintained Soccer Oval, Basket Ball Court, and facilities for indoor games.

The Students have internal house competition, and also participate in inter tertiary institutional Competition on all sports.

TIMBER INDUSTRY TRAINING COLLEGE  
 BUIKMO ROAD  
 P O BOX 2132 - LAE  
 PH: 42 - 1883

COURSE PROGRAMME FOR 1987 ACADEMIC YEAR  
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3.4 APPRENTICE EXTENSION COURSES

4.1 SAW DOCTOR

- 4.1.1 BLOCK COURSE STAGE ONE - 18 May - 26 June 1987
- 4.1.2 BLOCK COURSE STAGE TWO - 26 Oct - 4 Dec. 1987

4. WOOD MACHINING COURSES

4.1 BASIC WOOD MACHINING - PLANNER MOULDER AND GRINDERS

This Course is On Request Only - and Minimum number of Participants accepted to run the Course

This Course covers - Safety, Types of Cutters and Cutter Heads, Types of Machines, Setting up of Machines and their Operation, Knives Angles, Balancing of Knives and their Operation, Knives Grinding, Cutting Shape Geometry and Making Templates for Moulding Knives, Grinding Wheels and Types. Calculations, Jointing, Trouble Shooting.

4.2 ADVANCE WOOD MACHINING

13th July - 31st July 1987

Safety and Advanced Lectures and Practical on all Subjects of Machine Setting and Operation, Grinding Knife Making, Maintenance, Calculations, Tungsten Carbide and fine Knife Cutters, Finished Surface Requirements and Trouble Shooting.

4.3 JOINERY MACHINIST - MACHINE OPERATION

This Course is On Request Only - and Minimum number of Participants accepted to run the Course is FIVE.

The Course covers - Safety Setting up and Running Machines, Spindle Moulder, Thicknesser, Buzzer, Belt Sander, Band Saw, Circular Saw, Single and Tenoner, Chain and Chisel Mortiser Dowel Hole Borer, Finger-Jointing, Grading of Knives and Tools, Working from list, Joints used in Joinery, Jig Making, Headpower Tools Maintenance and Trouble Shooting.

4.4 APPRENTICE EXTENSION COURSES

4.4.1 WOOD MACHINIST

- 4.4.1.1 BLOCK COURSE STAGE ONE - 16 Feb - 27 March 1987
- 4.4.1.2 BLOCK COURSE STAGE TWO - 10 Aug - 18 Sept 1987.

...3/..

DATE	CODES	COURSE DETAILS	DURATION	INSTRUCTOR
02/02/87	PETT	Pre Employment Technical Training	40 Weeks	T BILALAY
02/02/87	SSM1/87	Small Sawmill Management	3 "	V LOKO
16/02/87	TIW 631	Apprentice Wood Machining Stage 1	6 "	G KINI
23/02/87	TIU 160	Chainsaw Operation & Management	2 "	G KINI
09/03/87	TIU 100	General Chainsaw & Tree Felling	2 "	E JAPKONG
		UNITTECH & FQUEST		T BILALAY
23/03/87	TID 302	Advance Bandsaw Maintenance	3 "	
23/03/87	SSM1/87	Small Sawmill Management	3 "	

T E R M O N E B R E A K 1 W E E K				
20/04/87	SSM1/87	Small Sawmill Management	3 Weeks	T BILALAY
04/05/87	TIVE 170	Timber Grading Course	2 "	P TRY
18/05/87	TID 331	Apprentice Saw Doctoring Stage 1	6 "	E JAPKONG
18/05/87	TIVE 100	Log Grading Course	4 "	T.I.T.C
01/06/87	TIU 112	Seasoning Course (AIR)	3 "	TO BE APPOINTED
08/06/87	SSM1/87	Small Sawmill Management	3 "	T BILALAY

T E R M T W O B R E A K 2 W E E K S				
13/07/87	TIW 602	Advance Wood Machining	3 Weeks	R LEISER
20/07/87	TIU 111	Dip Diffusion (PRESERVATION)	4 "	K KAPAL
20/07/87	SSM1/87	Small Sawmill Management	3 "	T BILALAY
27/07/87	TIU 114	Wood Identification	3 "	A AGLA
10/08/87	TIW 632	Apprentice Wood Machining Stage 2	6 "	R LEISER
10/08/87	TID 201	Circular Saw Maintenance & Circular Sawmill Operation	6 "	P BAVAK
17/08/87	TIVE170	Timber Grading	2 "	P TRY
31/08/87	SSM1/87	Small Sawmill Management	3 "	T BILALAY

T E R M T H R E E B R E A K 1 W E E K				
18/09/87	TIVE100	Log Grading	4 WEEKS	T.I.T.C
20/09/87	TIW 640	Joinery Machinist	4 "	R LEISER
26/10/87	TIVE160	Chainsaw Maintenance Operation	2 "	G KINI
26/10/87	TID 332	Apprentice Saw Doctoring Stage 2	6 "	E JAPKONG
16/11/87	SSM1/87	Advance Small Sawmill Management	3 "	T BILALAY

5. SAWMILL COURSE

5.1 SAWMILL FOREMAN COURSE

This Course is on Request Only - and Minimum number of Participants accepted before conducting the Course is FIVE.

5.2 CIRCULAR SAWMILL OPERATION AND SAW MAINTENANCE

10 August - 28 August 1987

This Course covers Log Scaling, Bucking Logs to Mill Length, Operation of Circular Breakdown, Operation of Manual Log Carriage, Transfers Systems, Operation of Breast Bench, Docking Grading and Stacking, Timber Tallying, Conversion Factors, Mill Alignment, Sawmill Maintenance and Trouble Shooting, Circular Saw Tension and Level, Tooth Profiles, Spring and Swage Setting, Files and Filing, Grinding and Grinding Machines, Hand Gulleting, Grinding Wheels Installed Tooth Saws.

5.3 TIMBER GRADING

4 May - 15 May 1987.

17 August - 28 August 1987

Introduction to Malayan Grading Rules for Sawn Hardwood. This includes Cutting System, Defects. Methods of determining Grade. Bucking to improve grade in the Logs. Headrig Cutting to improve grade. Docking Sawn Timber to improve Grade. Reawing for Grade. Practical Grading at the Green Chain and the Yard.

6. TIMBER PRESERVATION COURSE

6.1 PRESSURE TREATMENT PLANT OPERATORS

This Course is On Request Only

This Course covers Pressure Treatment Plant Equipment, PNG Timber Treatment Specifications Safety, Plant Operation, Maintenance and Servicing of Plant, Chemicals used Solutions Strengths Treatment Schedules, Analysis of Preservatives and Sampling of Treated Timber, Preparation of Charges and Handling of Treated Timber keeping of Records.

6.2 DIP DIFFUSION (PRESERVATION)

20 July - 4 August 1987

This Course covers the reason for Drying Timber and the Methods and Equipment that can be used to Dry Timber. Determination of Moisture Content, Stacking Practices, Types of Kilns, Drying Schedules, Drying Defects and Reconditioning. Types of Kiln eg:- Conventional and Solar Kilns.

3. SAW DOCTORING COURSES

3.1.

CIRCULAR SAW MAINTENANCE (INCORPORATED WITH SMALL SAWMILL MANAGEMENT)

- \* DATES - REFER TO SMALL SAWMILL MANAGEMENT COURSE
- This course has been incorporated with Small Sawmill Management Course.

This Course will help you to Maintain Heavy or Light Gauged Saws to improve accuracy recommend suitable Circular Saws for different applications. Topics covered include - Tensioning and Levelling by Setting Files and Filing, Grinding and Grinding Machines, Hand Gulleting, Grinding Wheels, Inserted Tooth Saws, Saw Fitting and Setting up, Trouble Shooting.

The Course also cover Calculations for Pulleys, Saw Speeds, Feed Speeds and Tooth Bite.

3.2. BAND SAW MAINTENANCE

23rd March 1987 - 10th April 1987.

This Course covers Tensioning and Levelling, (Heat and Roller) Butt and Crack Welding by Oxy-Acetylene and TIG Methods, Heat Treatment, Swaging and Shaping (Manual and Pneumatic), Grinding Machines, Grinding Wheels and Files, Tooth Profiles, High Frequency Induction Hardening, Stellite Tipping, Side Grinding or Equalising, Tooth Punching, Saw Shop Equipment its Operation and Maintenance, Trouble Shooting, Workshop Calculation Band Wheel Grinding. Safety in the Saw Shop and Mill Alignment.

3.3. CHAIN SAW MAINTENANCE AND OPERATION

23rd February 1987 - 6th March 1987  
9th March 1987 - 20th March 1987  
26th October 1987 - 6th November 1987

The Internal Combustion Engine, Fuels and Oils, Precautions, Maintenance, Chain Tensioning, Chain Lubrications, Break in Procedure Sharpening, Chain Repairs, Precautions prepare and Felling procedures, Bucking and Imbing.





UNITED NATIONS DEVELOPMENT PROGRAMME  
PROJECT OF THE GOVERNMENT OF  
PAPUA NEW GUINEA

PROJECT DOCUMENT

TITLE: Forest Management Research and Development

NUMBER: PNG/84/003/A/01/12      DURATION: 2.5 years

PRIMARY FUNCTION: Direct Support

SECTOR: (Government Class) (UNDP Class and Code)  
 Primary Industry      Agriculture, Forestry and Fisheries (05)


SUB-SECTOR: (Government Class) (UNDP Class and Code)  
 Forestry      Forestry (0540)

GOVERNMENT IMPLEMENTING AGENCY: Department of Forests

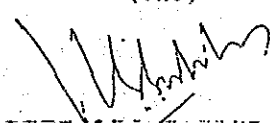
EXECUTING AGENCY: Food and Agricultural Organization of the United Nations (FAO)

ESTIMATED STARTING DATE: 1 June 1985

GOVERNMENT INPUTS: In kind 93,400 (Kina)      UNDP INPUTS: 403,000 (US. Dollars)

Signed:  Date: 24/5/85  
 On behalf of the Government

Signed: Mr. Ismet-Hakim's Cable FAO/G/DDF/1006 and Letter Ref: DDFP - PNG/84/003      Date: 8 June 1985  
 17 June 1985  
 (FAO)

Signed:  Date: 18 July, 1985

Resident Representative  
 Nemmara S. Subbaraman  
 (Mr. Andrew J. Joseph's Letter: 19/10/84).

PART I            LEGAL CONTEXT

This Project Document shall be the instrument referred to as such in Article I, paragraph 1, of the Assistance Agreement between the Government of Papua New Guinea and the United Nations Development Programme signed by the parties on 7 April 1981.

PART II            THE PROJECT

A.            Development Objective

The development objective of the project is to promote the scientific management of Papua New Guinea's forest resources, so that it can be perpetuated on a sustained or even increased yield basis.

B.            Immediate Objectives

1. To demonstrate and document suitable silvicultural and management techniques that would promote natural and artificial regeneration in logged over lowland tropical forests, so as to ensure sustained productivity of these forests.
2. To initiate and demonstrate appropriate logging techniques conducive to the furtherance of silvicultural techniques and thus the sustained productivity of the forestry resources.
3. To train four (4) Papua New Guinea nationals in silvicultural techniques who upon

completion of project inputs would be capable of continuing the program of research and development.

C. Special Considerations

The Constitution of Papua New Guinea stipulates that its natural resources must be conserved and used for the collective benefit of all Papua New Guineans and be replenished for future generations. In other words, ecological and environmental considerations must remain prerequisite to rational exploitation, in order to avoid irreversible adverse changes.

The absence of such considerations will detrimentally affect the long-term total value of the resource to be accrued to the people of Papua New Guinea. Therefore, the forest resource base must be rebuilt and the sustained productivity of the land ensured and retained. It is in this context that development of suitable management practices with the help of appropriate and adequate research efforts becomes imperative.

Apart from economic and social benefits, the project is directly concerned with safeguarding the environment and with sustained productivity of the land.

D. Background and Justification

(a) Background

Papua New Guinea experienced a fall in the

value of its exports by approximately ten percent in 1983, which followed a twenty-two percent drop in 1981. Preliminary predictions for the decade over the levels attained in the 1970's will be a massive twenty-eight percent. This situation, when coupled with the fact that externally financed technical assistance has been on the decline, further exemplifies the difficulties Papua New Guinea is facing in realizing its macro-development objectives.

In order to mitigate the effects of these difficulties, the Government of Papua New Guinea has undertaken a policy effort to further support the development of its national resource base. The forestry sector has thus been given priority status as a sector with great potential, recognizing that it will be so only if effectively managed.

In line with the objectives of the existing forest policy and in consideration of the desires of government for economic growth, employment generation and the new initiative of the government to restrict the exodus of people especially youths from the rural areas to towns and cities, it is recognized that forest resources can play a greater and meaningful contribution to meeting such objectives. Currently a total of 4000-5000 people are employed in this sector.

The extent of forest resources and the potential revenue generating capabilities are significant.

Total land area: 46 million hectares  
Total closed forest area: 33 million hectares  
Total operable forest area: 13.5 million hectares

Of the 13.5 million hectares of forest resources presently regarded as operable or accessible for development, there is an estimated 500 million cubic metres of logs. Current timber operators have rights over 900,000 hectares. An FAO report has estimated that sustained yield in the natural forests could be maintained at an annual harvest of almost 6 million cubic metres of sawlogs and 12 million cubic metres of pulpwood with proper management. The lowland rainforest (under 1000 m altitude) is rich in species. The total value of forest export during 1984 was K81.7 million, of which log export accounted for 86 percent; 1.3 million m<sup>3</sup> were exported. Royalty collected from timber operations has risen from K208,000 in 1958-59 to approximately K4.6 million in 1983.

It is realised that more than four fifths of the currently harvested Timber Right Purchase (TRP) area lies in the lowlands which contain a large number of high value timber species (e.g. *Callophyllum* spp, *Eriza*, *Hopea*, *Kamarere*, *Labula*, *Nersawa*, *White Cheesewood*, *Taun*, *Terminalias*, *Water gum*, *Kwila*, *N.G. Rosewood* - to name

a few including even a larger number of lesser known species and some very valuable minor forest products (for example, rattan) which presumably are destroyed during logging. A very small percentage of hardly 10-20 percent of the area is clearfelled for reforestation with monocultures. In the rest of the area, logging is selective; usually trees above 50cm diameter are harvested. However, to date, no silvicultural treatment has been carried out in these selectively logged forests. Not much is known as to how the forest reacts and recovers after logging, particularly in terms of regeneration of high value timber species. No silviculture technique has been developed to encourage, and augment regeneration and advance growth for the next cut. The damage to the natural regeneration and advance growth during logging has not been assessed. Similarly quantitative information is lacking on the effect of logging on general ecology (environment) and hydrology of the areas. This has lead to a degradation of what should be an important perpetual resource.

E.

#### Outputs

The project's outputs will include:

1. Demonstration and subsequent documentation of silviculture and management regimes to be applied to Papua New Guinea's lowland tropical forests in connection with logging in order to maintain sustained yields in

these areas with specific recommendations in terms of a natural and/or artificial regeneration.

2. Established field experiments and documentation outlining design, lay-out, and execution for developing Timber Stand Improvement (TSI) techniques.
3. Documented recommendations on logging techniques which would reduce logging damage and enhance natural and/or artificial regeneration of high value timber species.
4. Four (4) trained Papua New Guineans who upon completion of their training could be integrated into the research unit of the Department of Forests who would be capable of carrying on a silviculture programme of research.

F. Activities

1. The team leader will review in conjunction with government forestry officials, the ongoing research and development work in silviculture in order to:
  - (i) formulate and initiate a programme of silviculture research which utilizes work already completed within the field as it relates to P.N.G. and which does not duplicate efforts already taken.

(ii) produce documented recommendations concerning:

- silviculture techniques conducive to Papua New Guinea conditions
- Timber Stand Improvement techniques
- logging techniques compatible with the silviculture programme

(iii) assess the institutional/organizational support needed, and the requirements of funds and manpower for the implementation of the silviculture programme, both in terms of the short and long term.

2. Locate suitable sites, and layout field experiments, for monitoring natural regeneration, including artificial augmentation of natural regeneration, of logged over areas, so as to ensure perpetuation of commercially desirable species in these areas.
3. Utilizing the results of the manpower assessment consultancy funded under PNG/84/001, and the government's detailed training programme for the silviculture sector, identify and train in overseas institutions four PNG nationals, in the fields of silviculture, mensuration and logging techniques.

G. Inputs

(a) Government Inputs



The first Assistant Secretary - Research and Training of the Department of Forests will be the National Project Director and will manage the Government inputs to the project under the general supervision of the Secretary of Forests.

Government inputs will include counterpart support, from existing staff who will work with the FAO staff; suitable furnished office space and administrative support personnel for project staff both in and out of the National Capital District; accommodation/transportation wherever possible, and all other incidental costs which may arise.

The Government shall identify and release selected personnel for training, under the fellowship component of the project, with normal salary and allowance paid while on training.

The Government will also provide any prerequisite equipment i.e. chainsaws, handtools, crawler tractors, articulated wheeled skidder, winch trucks etc. This equipment will be made available from the Timber Industry Training College and from loan agreements negotiated between the Department of Forests and concerned private companies.

(b) UNDP Inputs

Assignment of International Staff

1. Silviculturist (Team Leader) (18 m/m)

He will be responsible for overall administration of the project, coordinate the work of other advisers so as to ensure achievement of immediate objectives, facilitate identification and placement of other advisers and national counterparts, and identify and place PNG

nationals for training in silviculture research in appropriate fields.

He will have experience in tropical silviculture, and will formulate a detailed work plan for the project to identify areas/sites/aspects; work out manpower and facilities requirements for implementing the programme; design and lay-out field survey (pre- and post-felling regeneration) experiments; standardize procedures, take periodic observations and measurements, analyze and document research results towards developing Timber Stand Improvement techniques.

2. Mensuration Adviser ((12 m/m)

He will have experience in survey, mensuration and biometrics, and will assist and supplement the Team Leader in the technical programme as stated in paragraph 2 above, i.e. layout field experiments in logged areas and conduct other silvicultural trials.

3. Logging Adviser (12 m/m)

He will have logging experience in the tropics, and will work in close collaboration with the other two advisers, to design procedures and field experiments to assess the damage to the standing crop and the regeneration in the

present logging and transport system, and make recommendations to enhance, modify or change the present logging methods in order to minimize the damage to the soil and to the advance growth and lower diameter class trees in a selective logging system.

He will also pay due attention to the safety aspects of the present logging methods in order to minimize the risks involved.

#### Training

The project will provide for thirty-four man-months of fellowship training in countries with similar experiences in the fields of silviculture, mensuration and logging techniques.

#### Equipment

##### (a) Expendable Equipment

- Limited office equipment, including specialized stationery for maintaining accurate financial data and research data.
- Books, journals and periodicals of value for carrying out research.
- Unspecified items.

A total provision of US\$1600 will be made for this component.

(b) Non-expendable Equipment

- Two (2) Toyota Land Cruisers	- 15,900
- Typewriter	- 600
- Calculator	- 200

Mission Costs

Provision is made for an evaluation mission in 1986 which will also make recommendations on future assistance.

Miscellaneous

Provision is made to cover printing of reports, insurance of vehicles and sundry expenses.

H. Preparation of the Work Plan

A detailed Work Plan for the implementation of the project will be prepared by the Team Leader in consultation with the National Project Director. This will be done at the start of the project and brought forward periodically. The agreed Work Plan will be attached to the Project Document as Annex I and will be considered an integral part of this document.

I. Preparation of the Framework for the Effective Participation of National and International Staff in the Project

The activities necessary to produce the indicated outputs and achieve the project's immediate objectives will be carried out jointly by the

national and international staff assigned to it. The respective roles of the national and international staff will be determined by the Team Leader and the National Project Director by mutual discussion and agreement, at the beginning of the project, and set out in a Framework for Effective Participation of National and International Staff in the Project Document as Annex II, which will be reviewed when deemed necessary. The respective roles of the national and international staff shall be in accordance with the established concept and specific purposes of technical co-operation.

J. Development Support Communication

The implementation of this project will undoubtedly call for the active participation and support of local communities who are the traditional owners of the forest lands and who stand to benefit from the activities of the project. The co-operation and participation of local communities should be sought by the Department of Forests for successful implementation of this project.

K. Institutional Framework

The Department of Forests will act as implementing agency for this project. The First Assistant Secretary, Research and Training will be the National Project Director.

L. Prior Obligations and Pre-Requisites

The Government of Papua New Guinea via the Department of Forests will provide the necessary office accommodation, administrative support and other facilities needed for smooth and effective functioning of the project. The required staff for implementation of the project will be made available, as deemed necessary, by the Department of Forests from out of its existing staff.

The Government of Papua New Guinea undertakes to provide the costs of office overheads, servicing and maintenance expenditure for the vehicle and all other inputs as specified in Part II G and Annex I of this document.

The Government of Papua New Guinea will either put at their disposal, or assist international staff to secure residential accommodation while in Papua New Guinea.

The Project Document will be signed by the Resident Representative on behalf of UNDP, and UNDP assistance to the project will be provided if the pre-requisites mentioned above are expected to be met to UNDP's satisfaction.

M. Future UNDP Assistance

It is anticipated that Government will request further large-scale assistance in the forestry sector in the Fourth UNDP Country Programme 1987-90.

PART III SCHEDULES OF MONITORING, EVALUATION AND REPORTS

A. Tripartite Monitoring Reviews

The project will be subject to evaluation, in accordance with the policies and procedures established by UNDP for monitoring project and programme implementation.

B. Evaluation

The project will be subject to evaluation, in accordance with the policies and procedures established for this purpose by UNDP. The organization, terms of reference and timing of the evaluation will be decided by consultation between the Government, UNDP and the Executing Agency concerned.

C. Progress and Terminal Reports

The Chief Technical Adviser will submit six-monthly project progress reports prepared in accordance with UNDP procedures, which will be timed appropriately and delineated within the work plan. The project progress reports will be in UNDP format and according to UNDP policies and procedures relating to reports. The Chief Technical Adviser will additionally be responsible for preparing and submitting prior to his/her departure the Terminal Report, again in accordance with UNDP policies and procedures relating to reports.

PROJECT BUDGET COVERING GOVERNMENT CONTRIBUTION IN KIND  
(in Kina)

Country: Papua New Guinea  
 Project Title: Forest Management Research and Development  
 Project Number: PNG/84/003/A/01/12

DESCRIPTION	1985		1986		1987	
	m/m	Kina	m/m	Kina	m/m	Kina
<u>PROJECT PERSONNEL</u>						
Contract to Expert in Silviculture Research	12.0	9,600	6.0	4,800	6.0	4,800
Contract Measurement Adviser	2.0	1,600	1.0	800		
Contractors	48.0	12,000	12.0	3,000	24.0	6,000
Administrative Support (2 Secretaries)	48.0	19,200	12.0	4,800	24.0	9,600
<u>MISCELLANEOUS</u>						
Office Overheads and Operating Expenses K1500 per month	24.0	36,000	6.0	9,000	12.0	18,000
Expenditure on Field Trials and Surveys		8,000		4,000		4,000
Contingencies		12,000		3,000		6,000
<b>R A N D T O T A L</b>	<b>134.0</b>	<b>98,400</b>	<b>37.0</b>	<b>29,400</b>	<b>66.0</b>	<b>49,200</b>
					<b>30.0</b>	<b>19,000</b>



Project Budget Covering INP Contribution (in \$ Dollars)

Country: Japan New Guinea  
 Project No.: PNC/86/XXX/A/01/12

Title: Forest Management Research and Development

	1983	1984	1985	1986	1987	1988
	m/m	m/m	m/m	m/m	m/m	m/m
	\$	\$	\$	\$	\$	\$
TOTAL	14108	14108	14108	14108	14108	14108
1100 PROJECT PERSONNEL						
1100 EXPERTS						
1101 Silviculturist/Teacher	18		3	12	3	21000
1102 Measurement Adviser	12		2.5	17500	9.5	66000
1103 Logging Adviser	12		2	14000	10	69000
1199 Sub Total	42	0	0	0	0	0
1200 Admin. Support Staff						
1201 Official Travel			2000			9000
1202 Other Costs						5000
1203 Prior Year Adj.						0
1299 Component Total	42	0	0	0	0	0
2100 TRAINING						
2101 Indiv. Fellowships	36			25	9	15005
2200 Group Training	0					11000
2300 In-country Training	0					0
2400 Prior Year Adj.	0					0
2999 Component Total	36	0	0	0	0	0
4000 EQUIPMENT						
4100 Expendable			800			800
4200 Non-expendable			15000			15000
4999 Component Total			16700			16700
5000 MISCELLANEOUS						
5100 Operation & Maint.						
5200 Reports			750			2000
5300 Supply						1000
5999 Component Total			750			3000
9999 GRAND TOTAL	403000	0	0	293425	4025	0
1000 COST SHARING						
1001 Cost Sharing	0		0			0
1099 Component Total	0		0			0
1500 Support cost						
1599 Component Total	0		0			0
1999 TOTAL COST SHARING	0		0			0
9999 GRAND TOTAL	403000	0	73550	293425	4025	0

FO: PNG/84/003

Working Document No. 2

FOREST MANAGEMENT RESEARCH AND DEVELOPMENT

P A P U A   N E W   G U I N E A

WORK PLANS FOR THE PROJECT PNG/84/003

Prepared by: Brian Kingston,  
Chief Technical Adviser.



UNITED NATIONS DEVELOPMENT PROGRAMME

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FOOD AND AGRICULTURE ORGANIZATION OF  
THE UNITED NATIONS - Lae, July, 1987

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  - 5.2 Activities
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### APPENDIX 1. PROJECT WORK PLANS

- a) Activity schedule for CTA/Mensuration Adviser
- b) Activity schedule for Logging Adviser
- c) Activity schedule for Silviculture Adviser

## 1. OBJECTIVES

### 1.1 BACKGROUND DEVELOPMENT OBJECTIVES

The Government of Papua New Guinea, assisted by the Food and Agriculture Organization of the United Nations (FAO) through the United Nations Development Programme (UNDP) initiated, in 1984, a project entitled "Forest Management Research and Development".

The Constitution of Papua New Guinea stipulates that its renewable natural resources must be conserved and used for the collective benefit of all Papua New Guineans and be replenished for future generations. In view of the increasing demand for tropical hardwoods from Papua New Guinea, the embargoes and limitations placed on log exports by neighbouring countries in S.E. Asia, and the increasing awareness and concern throughout the world about the reduction of the tropical high forest, the timing of this project is particularly opportune.

In line with the objectives of the existing forest policy and in consideration of the desires of government for economic growth and employment generation, the forestry sector has been given priority status as a sector with great potential recognizing that it will be so only if effectively managed.

There are 13.5 million hectares of forest resources currently regarded as operable or accessible for development containing an estimated 500 million cubic metres of logs. Current logging concessions are estimated at approximately 1 million hectares. Sustained yield from this resource could be maintained at an annual harvest of around 6 million cubic metres of sawlogs and 12 million cubic metres of pulpwood with appropriate management according to an FAO source. Logging in these forests is selective with a minimum diameter limit of 50cm. Today, no silvicultural treatment has been applied to these selectively logged forests and little information is available on how the forest reacts and recovers after logging nor has any assessment been made of damage to the residual trees and regeneration caused by logging. No silviculture technique has been developed to encourage and augment regeneration and residual trees after logging for the next cut.

## IMMEDIATE OBJECTIVES OF THE PROJECT

The purpose of project activities is to contribute to the development objectives by assisting government in obtaining and evaluating technical and economic information. The specific terms of reference are:

- i) To demonstrate and document suitable silvicultural and management techniques that will promote natural and artificial regeneration in logged over lowland tropical forests so as to ensure sustained productivity of these forests;
- ii) To initiate and demonstrate appropriate logging techniques conducive to the furtherance of silvicultural techniques and thus the sustained productivity of the forestry resources; and
- iii) To train four Papua New Guinea nationals in silvicultural, mensurational and logging techniques who upon completion of the project and their training will be capable of continuing the programme of research and development.

The inputs necessary to achieve these objectives assigned to the three specific disciplines within the project, namely, mensuration, logging and silviculture are: grouped as follows:

Objective 1.i) Mensuration and specific input of the Chief Technical Adviser

- a) Assist the Government of Papua New Guinea in the implementation of forest management, research and policy including identification of problem areas and regeneration of forests after logging.
- b) Identification of a programme of forest management research.
- c) Preparation of research standards.
- d) Identify and locate suitable sites in logged over forest areas for research activities.
- e) Design and supervise T.S.I. inventories and experiments.

ii) Logging

- a) Examine current logging methods at a selection of representative logging operations including small mobile units.

iii) Silviculture

- a) Examine the effects of logging on the ecological succession and environmental conditions in the lowland rainforest.
- b) Formulate a programme of silvicultural research needed for the management of the natural forests.

Objective 2.

i) Logging

- a) Set up model logging plans and operations in cooperation with logging companies at selected representative sites to demonstrate these logging systems and to produce stand conditions suitable for follow up management research.

ii) Silviculture

- a) Identify the appropriate silviculture system or systems suitable for successful regeneration of the forests after logging. Specify the optimum level of treatment or techniques required which will minimize the need for post logging treatments.
- b) Identify a priority listing of currently non-merchantable species suitable for utilisation and marketing studies.

Objective 3.

Training in all disciplines of natural forest management will be arranged through on-the-job training, study tours and fellowships in Papua New Guinea and overseas.

## 2. ORGANIZATION OF ACTIVITIES

To assist the project as a whole in achieving its objectives and identified outputs (see project document, PNG/84/003 page 6 & 7), information will be collected or generated and accumulated throughout the course of the project from various sources which can be grouped as follows:

- Current research
- Project research forests
- Demonstration areas

Work will be further organised in three phases:

- Examination phase
- Monitoring phase
- Prediction phase

### 2.1 EXAMINATION PHASE

Current and past research in the natural forests will be examined. Information and data on the condition of the logged over forests, growth and yield will be collected and an examination and comparison of logging methods made. This information will be scrutinized in order to identify as well as possible that information which is appropriate and satisfactory for further studies. Forest stands will be selected for continuing research and demonstration of suggested and confirmed methods of management.

### 2.2 MONITORING PHASE

Data will be accumulated to provide continuous information on crop or operational performance to be used for the determination of the most suitable and alternative methods of forest and harvesting management.

Since project activities include experimental work it will be necessary to coordinate the results of the experiments. It will further be necessary to establish experiments or investigations specifically to cover gaps in the available knowledge. Thus, two levels of activity will be required during this phase in order to provide as complete information as possible for the prediction phase:-

- Experimental level
- Operational level

### 2.3 PREDICTION PHASE

Information and data gathered in the previous phases will be used to predict the future growth and development of trees or stands, enabling economic feasibility studies to be carried out and management alternatives to be determined and forecast, etc.

### 2.4 CATEGORIES OF INFORMATION

Regeneration activities can be conveniently grouped to provide suitable categories of relevant information as follows:

- Logging
- Diagnostic inventory
- Seed Production
- Nursery Production
- Liberation
- Enrichment

These will include such matters as stock mapping and logging damage, silvicultural condition of the forest after logging and removal of competition to benefit the residuals forming the next crop.

Numerous factors have their various effects and interaction on harvesting and regeneration of the forests. These include:

- Geology and geomorphology
- Ecology, soil and vegetation
- Altitude and climate
- Slope
- Species and condition of residuals
- Operation and equipment, etc.

To compare the effects of these factors, their reaction and interactions, numerous data must be collected in order to assess the performance of labour, materials, machines and tree species. Basic data will include:

Growth parameters	- Survival, height, diameter, volume, crown and stem form, stand development.
Yield parameters	- Volume under and over bark etc.
Operational performance	- Labour and machine outputs recorded in hours, mandays or manhours per hectare and cost categories per unit.



### 3. ORGANIZATION OF DATA COLLECTION AND RECORDING

The data will fall into two distinct categories which may originate from research or operational activities:

Operational data

Growth and yield data

#### 3.1 RESEARCH

All research will be organized under a series of master plans and control plans which will identify and describe the type of research, its organization and implementation. Research will be designed to explore or compare treatments and to monitor the performance of crops, providing a ready and continuous flow of regulated information and data. This research will be conducted in Research Forests and Demonstration Forests as well as in other logged over forests consisting of experiments and continuous inventory activities, including both permanent and temporary plots.

#### 3.2 DATA STORAGE

Considerable amounts of data will become available during the period of the project for which adequate methods of data recording, processing and summarizing must be evolved. Eventually it may be necessary to store this information on computer file to facilitate access, analysis and predictions. Suitable systems and data recording forms will initially be designed.

### 4. PROJECT REPORTING SYSTEM

#### 4.1 BACKGROUND

The FAO Director-General's Bulletin No. 77/58 of 20 October 1977 established guiding principles for project reporting. These are applicable to all field projects irrespective of their source of funding. The Bulletin states that the main purpose of field project reports is to provide information and guidance to the host government on the implementation of technical activities.

The needs of the users within the government determine the type of reports to be prepared, i.e.,

Terminal Reports - which are addressed to the policy and planning levels;

Technical Reports - which are intended for the senior operational and implementation levels within the government, and

Field Documents - which are prepared to support activities at the professional or sub-professional levels.

In addition periodic Progress Reports are prepared to monitor progress and initiate action during project implementation.

## 4.2

### CLARIFICATION OF REPORTS

In its system of field programme reporting, FAO classifies reports according to the purpose they are intended to serve. Reports arising from the activities of all types of field projects are therefore placed in one of the four categories quoted above. Each category of document serves a different purpose as follows:

#### 4.2.1 Terminal reports

A terminal report on a project is prepared by the organization and is submitted formally to the government. Its main purpose is to give guidance at ministerial and senior government level on the policy decisions required for the follow-up of the project. The terminal report is accordingly a concise statement of the main findings conclusions and recommendations of the project, with the strict minimum of detail on project background and results. Work is assessed rather than described, and recommendations are expressed in terms of their application to the country's economy and technology in the context of its development priorities.

A terminal report is required for each project except where it is agreed in advance by the government and the organization that other documentation to be produced by the project will serve the same purpose.

#### 4.2.2 Technical reports

Technical reports are substantive project reports prepared by project experts consultants or sub-contractors for formal transmittal to governments. They have three-fold purpose:

- a. to facilitate a timely decision by the government on follow-up action;
- b. to built up a body of documentation upon which the terminal report will be based;
- c. to record, in durable form, the knowledge and results obtained from project activities for continuing reference and use initially in the host country and eventually, upon derestriction of the report, elsewhere.

Technical reports convey to the government the conclusions and recommendations formulated by FAO on the basis of the finding and results of specific project activities, FAO is the authority of issue of technical reports and is solely responsible for their conclusions and recommendations.

#### 4.2.3 Field documents

Field documents are substantive project reports transmitted informally to the government. They are intended primarily for technical staff concerned with the detailed implementation of follow-up of the project. Field documents may also be prepared for a wider readership and may be issued as extension and training material or as articles published in technical journals.

Field documents are issued under the authority of the project leader.

#### 4.2.4 Project progress reports

Progress reports are management reports prepared at specific intervals for the government, FAO and the donor organization to provide information on the progress and status of a project, and to identify problems and call for corrective action. The authority of issue is the project leader.

Further descriptive details of the reporting procedure may be found in the "FAO Field Programme Manual, Rome, 1980".

### 4.3 FLOW OF INFORMATION AND REPORTING

A chart indicating the reporting requirements of the project and the flow of information and reports is indicated in Figure 1. At all levels data will also be collected, processed, evaluated and stored. Resulting reports will be issued to the Forest Service, UNDP and FAO.

Note:  
 The information and data flow associated with each type of report will be in the following form:

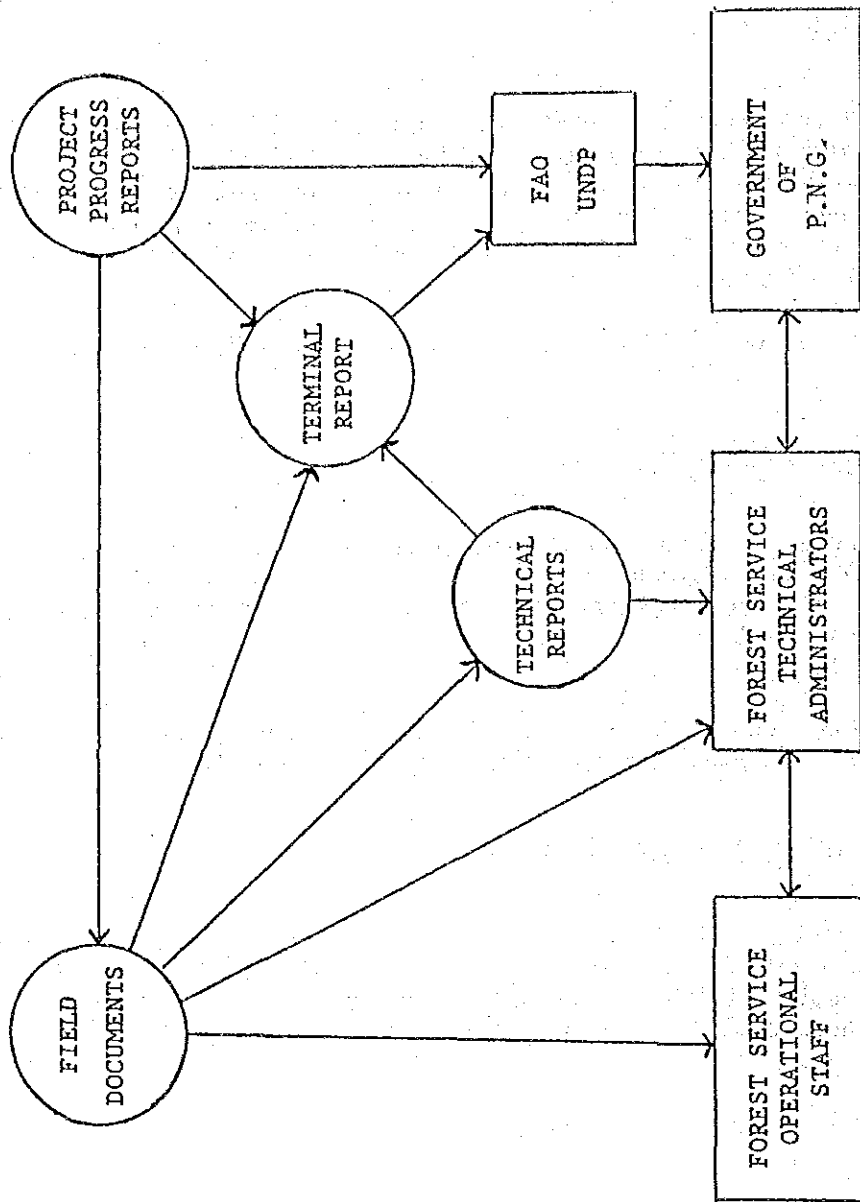
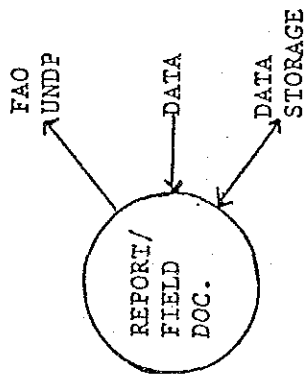


Figure 1 - Flow chart of project information and reports

PROJECT WORK PLAN - ACTIVITY SCHEDULE FOR CTA/MENSURATION ADVISER

APPENDIX 1a

Project Title: Forest Management Research and Development

Prepared by: B. Kingston, C.T.A.

Project No: PNG/84/003

Date of issue: 26/06/87

Work Plan No: 1

To be revised on: 31.12.87

Page 1 of 3 Pages

Description of Work Objective, Output and Activity	1987				1988				Remarks
	1	2	3	4	1	2	3	4	
1. Assist the Government of Papua New Guinea in the implementation of forest management, research and policy including identification of problem areas and regeneration of forests after logging.									
i) Preparation of species volume tables;									
ii) Identification of policy concerning management of the natural forest and research support needed;									
iii) Identification of management problems in the regeneration of natural forests and assignment of priorities for research;									
iv) Preparation of a forest management research plan for the natural forests.									



Project title: Forest Management Research and Development  
 Prepared by: B. Kingston, C.T.A.  
 Project No: PNG/84/003 Date of issue: 26/06/87  
 Work Plan No: 1 To be revised on: 31-12-87  
 Page 1 of 2 Pages

Description of Work Objective, Output and Activity	1987				1988				Remarks
	1	2	3	4	1	2	3	4	
1. Examine current logging methods at a selection of representative logging operations including small mobile units: i) Identify local site conditions, forest types and demand for species conditioning the logging system employed; ii) Assess the appropriateness of current logging operations for the protection of the residual trees; iii) Determine the current type and amount of logging and environmental damage.									
2. Set up model logging plans and operations in cooperation with logging companies at selected representative sites to demonstrate these logging systems and to produce stand conditions suitable for follow-up management research: i) Selection of sites ii) Preparation of stockmaps from 10cm diameter and upwards of all merchantable and currently non-merchantable species; iii) Preparation of logging plans and implementation; iv) Wherever possible provided estimates of increased or reduced costs of production.									

PROJECT WORK PLAN - ACTIVITY SCHEDULE FOR LOGGING-ADVISER

APPENDIX 1b

Project Title: Forest Management Research and Development

Prepared by: B. Kingston, CIA.

Project No: PNG/84/003

Date of issue: 26/06/87

Work Plan No: 1

To be revised on: 31.12.87

Page 2 of 2 Pages

Description of Work Objective, Output and Activity	1987				1988				Remarks
	1	2	3	4	1	2	3	4	
3. Provide training for the national counterparts in logging techniques.									
4. Prepare a report summarizing activities, achievements and recommendations.									



Project Title: Forest Management Research and Development Prepared by: B. Kingston, C.T.A.  
 Project No: PNG/84/003 Date of issue: 26/06/87  
 Work Plan No: 1 To be revised on: 31/12/87  
 Page 1 of 2 Pages

Description of Work Objective, Output and Activity	1987				1988				Remarks
	1	2	3	4	1	2	3	4	
1. Examine the effects of logging on the ecological succession and environmental conditions in the lowland rain forest, in particular: <ul style="list-style-type: none"> <li>i) Influences of site conditions, forest type and canopy gap sizes on regeneration;</li> <li>ii) Site degradation due to selective and clear felling;</li> <li>iii) Rehabilitation after logging due to natural regeneration and replanting or enrichment.</li> <li>iv) Determine the conditions required to be created by logging as a silvicultural operation.</li> </ul>									
2. Identify the appropriate silvicultural system or systems suitable for successful regeneration of the forests after logging. Specifying the optimum level of treatments or techniques required which will minimize the need for post logging treatments: <ul style="list-style-type: none"> <li>i) Identify species lists which should be compulsory for logging and desirable for regeneration.</li> <li>ii) Specify minimum cutting diameters which should be applied to compulsory species;</li> <li>iii) Identify the silvicultural requirements of the desirable species;</li> <li>iv) Define optimum stocking and determine the alternative choices for regeneration including natural regeneration, enrichment and replanting.</li> </ul>									

PROJECT WORK PLAN - ACTIVITY SCHEDULE FOR SILVICULTURE ADVISER

APPENDIX 1c

Project Title: Forest Management Research and Development  
 Project No: PNG/84/003  
 Work Plan No: 1  
 Prepared by: B. Kingston, C.T.A.  
 Date of issue: 26/06/87  
 To be revised on: 31.12.87  
 Page 2 of 2 Pages

Description of Work Objective, Output and Activity	1987				1988				Remarks
	1	2	3	4	1	2	3	4	
v) Determine the cost efficient means of removing competitive and undesirable tree species.  3. Formulate a programme of silvicultural research needed for the management of the natural forests including: i) Phenology of desirable tree species; ii) Seedling dynamics; iii) Enrichment trials; iv) Timber stand improvement; v) Agroforestry in the natural forests; vi) Forest products, other than timber trees, to include rattans and other palms; vii) Identify institutional and training requirements to support such a programme.  4. Identify a priority listing of currently non-exchangeable species suitable for utilisation and marketing studies.  5. Prepare a report summarizing activities, achievements and recommendations.									

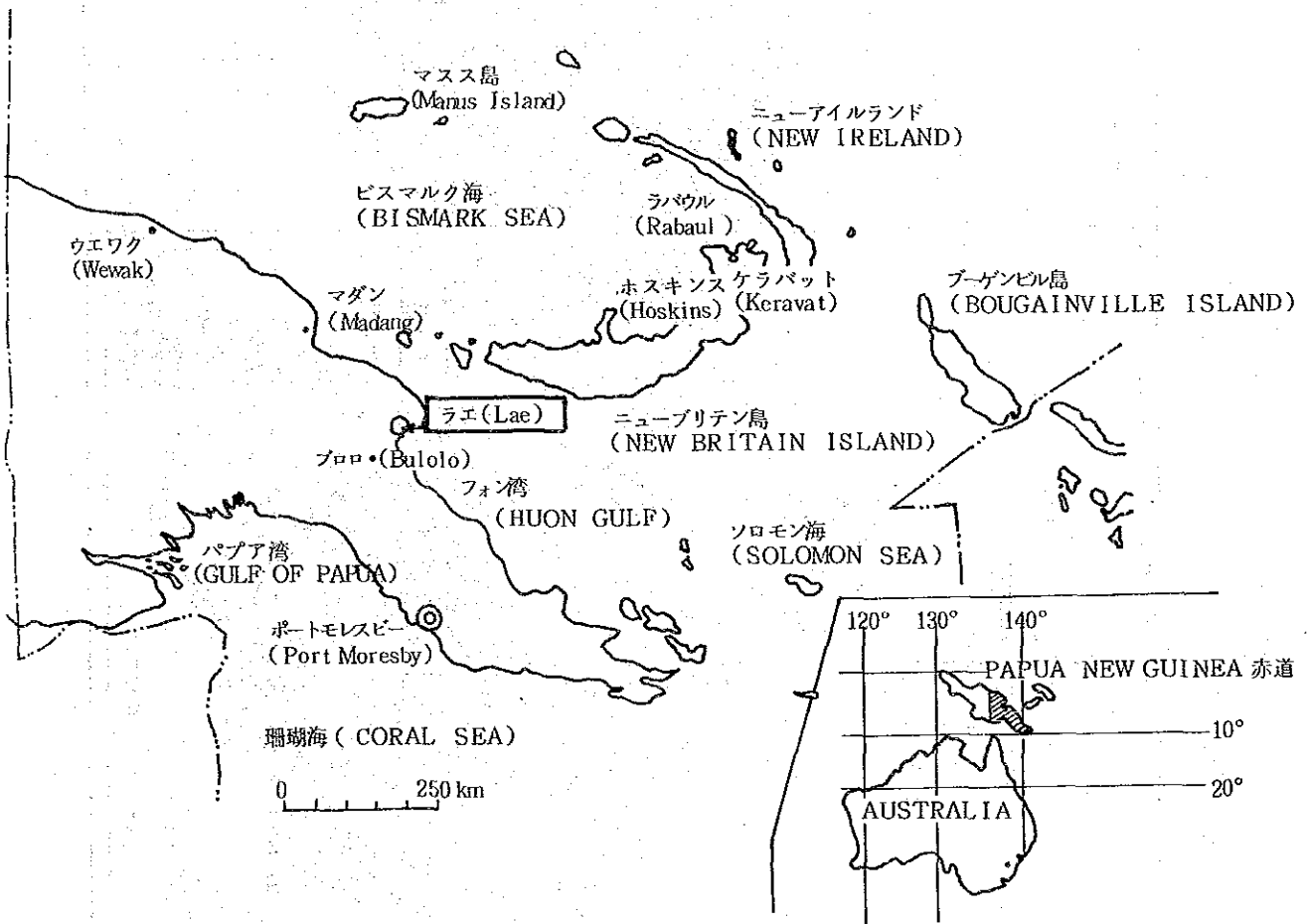
### Ⅲ. パプア・ニューギニア森林研究計画

#### 実施協議調査団報告

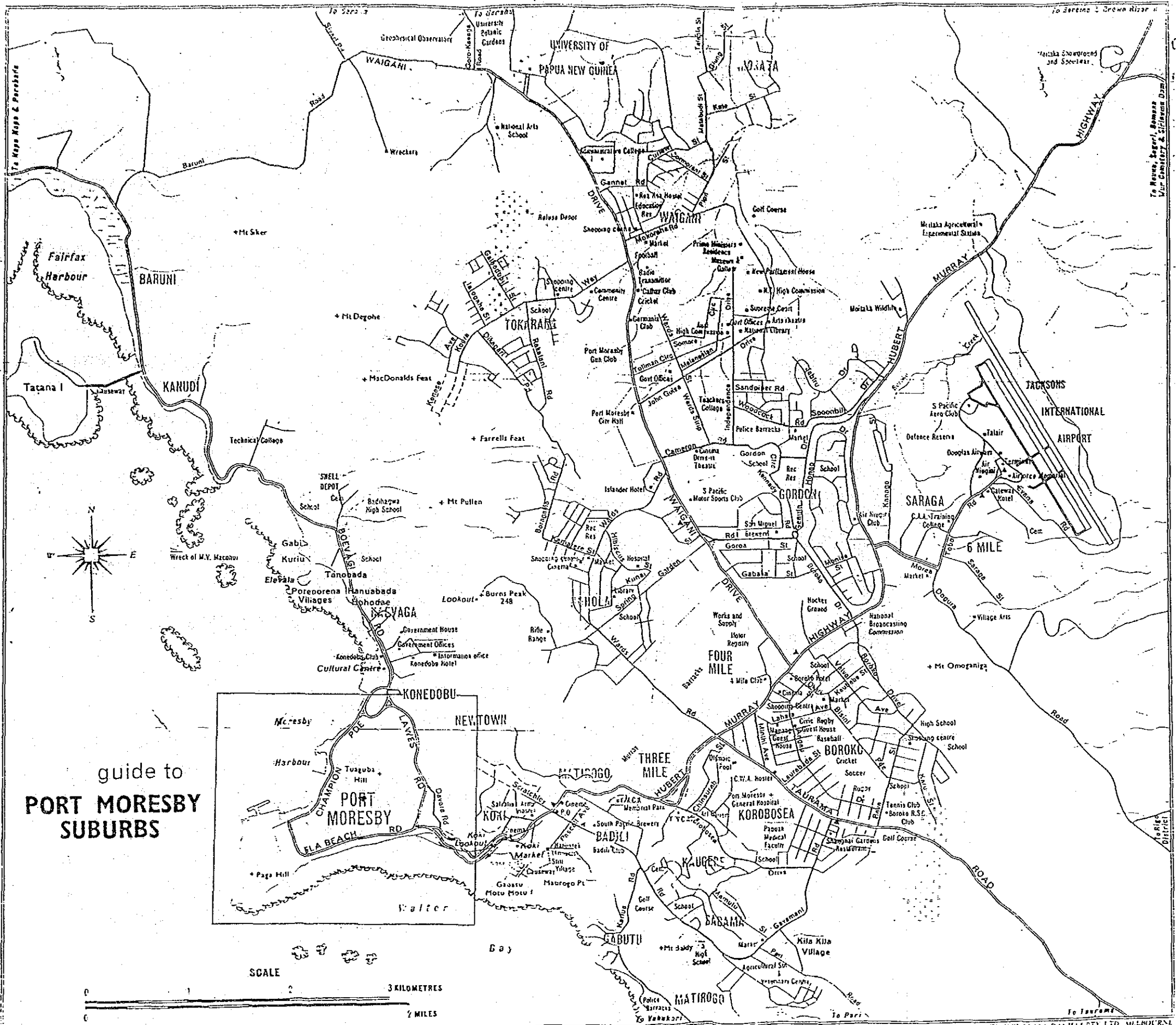
昭和63年11月5日～11月19日（15日間）



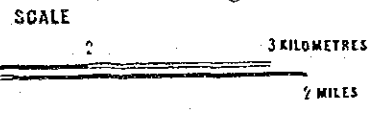
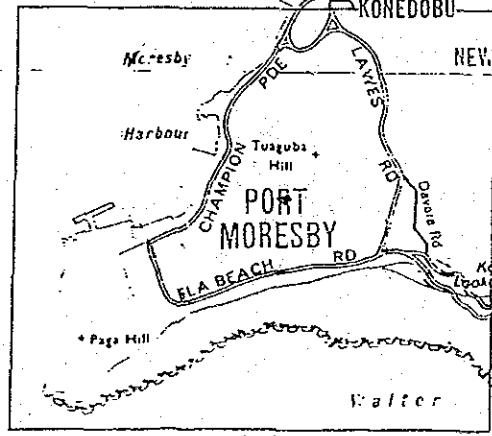
パプア・ニューギニア概要図  
 (PAPUA NEW GUINEA)







guide to  
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## 1. 実施協議調査団派遣

### 1-1 調査団派遣の経緯と目的

パプア・ニューギニアは1975年独立以来、森林資源の開発を積極的に推進しその開発は同国の経済発展に大きく寄与しており、今後とも同国の発展を図る上で森林資源の持続的な開発は不可欠である。しかしながら、森林資源の造成、保全並びに木材の有効利用の研究は著しく立ち遅れている。

このような状況から、PNG政府は、1986年に我が国政府に対し、各地に分散している林業関係の3研究機関をレイ市(Lae)に統合し、林業・林産業の試験研究を総合的に推進するため、森林研究所の建設の無償資金協力とプロジェクト方式技術協力を要請してきた。

森林研究所建設の無償資金協力要請に対しては、1987年2月事前調査団派遣同年7月B/D調査団派遣、1988年1月E/N締結、1989年3月工事完了が見込まれ、同年4月に延面積 6,490㎡の森林研究所(1,555百万円)と研究機材(204百万円)が引き渡される計画である。

プロジェクト方式技術協力要請に対しては、1987年5月にコンタクト調査団を派遣し、要請内容及び実施体制を確認し、PNGにおける研究水準、協力課題等の調査を行なった。

こうした一連の調査結果並びに先方との協議結果を踏まえ、パプア・ニューギニアにおける第一号のプロジェクト方式技術協力を、森林研究所の完成にあわせて開始するべく、今回の実施協議調査団を派遣し、プロジェクト実施体制の最終的な確認を行なうとともに、R/D及びプロジェクト暫定実施計画について同国政府関係機関と協議し、それぞれに署名を行ない、また、その協議の内容についてミニッツを確認事項として残した。

また、無償資金協力及びプロジェクト方式技術協力の現在までの経緯と今後の予定を、表1-1に記した。

### 1-2 調査団の構成

パプア・ニューギニア森林研究計画実施協議調査団(5名)

- |          |      |                               |
|----------|------|-------------------------------|
| 1) 藤森 隆郎 | 総 括  | 森林総合研究所 生産技術部 育林技術科長          |
| 2) 高畑 博之 | 協力企画 | 農林水産省 経済局 国際協力課 海外技術協力官       |
| 3) 香山 彊  | 林産研究 | 北海道大学 農学部 林産学科 林産製造学講座 教授     |
| 4) 楠木 学  | 林業研究 | 森林総合研究所 九州支所 保護部 樹病研究室長       |
| 5) 越智 讓  | 業務調整 | 国際協力事業団 林業水産開発協力部<br>林業開発課 職員 |

表1-1 現在までの経緯および今後の予定

	無償資金協力	プロジェクト技術協力
1982. 11.	J. 南太平洋プロジェクトファインディング調査団派遣 P. 森林研究所施設供与とその後のプロジェクト方式技術協力要請	
1985. 1.	P. 第一次産業省 (Department of Primary Industry) の下の森林局 (Office of Forests) から森林省 (Department of Forests) への昇格	
1986. 2.	P. PNG政府外国援助受入政策の見直しを発表 (日本側のタイド援助是認)	
1986. 4.	J. 日本の援助スキームを説明するためのミッションを派遣	
1986. 7. 11	P. 口上書にて、無償資金協力及び技術協力について要請 (在PNG日本大使館発交信 373号 509号)	
1986. 11. 26 ～ 12. 5	J. 上記要請背景調査把握のためプロジェクト形成基礎調査団派遣	
1987. 2. 24 ～ 3. 9	森林研究所設立計画事前調査団派遣	
1987. 5. 31 ～ 6. 13		PNG森林研究計画コンタクト調査団派遣
1987. 7. 18 ～ 8. 10	森林研究所設立計画B/D調査団派遣	
1987. 10. 26 ～ 12. 5		PNG森林研究計画長期調査団派遣 (林業、林産 各一名)
1988. 1. 11	森林研究所設立計画E/N締結	
1986. 4. 1	工事着工	
1986. 11. 5 ～ 11. 19		PNG森林研究計画 実施協議調査団派遣
1986. 3. 15	工事完了 施設、機材等引き渡し	
1986. 4. 1		プロジェクト協力開始 長期専門家派遣

1-3 調査日程 (15日間)  
調査日程は次のとおりである。

日付		
(土) 11月 5日	20:00	成田発 (JL-771)
(日) 6日	07:20 11:00 15:25	シドニー着 シドニー発 (QF-095) ポートモレスビー着
(月) 7日		JICA事務所・大使館表敬訪問、打ち合わせ
(火) 8日		大蔵計画省表敬、来意・日程説明 森林省・大蔵計画省協議 (R/D及びT.S.I.両案の説明)
(水) 9日		JICA事務所において、対処方針打ち合わせ 森林省HDQにおいて要請書等手続きの説明
(木) 10日	12:30 13:15	ポートモレスビー発 (PX260) レイ着 森林省関係者との事前協議 (FRI建設事務所) FRI・宿舎建設現場視察
(金) 11日		森林省関係者との協議 (FRI建設事務所) レイ→(車)→プロロ
(土) 12日		プロロ森林研究所 (昆虫・樹病・Seed Bank)、林業大学、試験林、 苗畑等調査 プロロ→(車)→レイ コンサル・JOCV隊員生活事情聴取
(日) 13日		生活環境調査 (レイ市内)
(月) 14日	15:10 15:55	UNITECH・TITC・苗畑 (Oomsis) 調査 レイ発 (PX189) ポートモレスビー着
(火) 15日		森林省協議 (森林省HDQ)
(水) 16日		R/D、T.S.I.、ミニッツ署名 (森林省・大蔵計画省)
(木) 17日		資料整理及び団内打ち合わせ (JICA事務所) 日本大使館報告
(金) 18日	15:00 21:25	JICA事務所報告 ポートモレスビー発 (QF-096) シドニー着
(土) 19日	10:40 18:00	シドニー発 (JL-772) 成田着

1-4 主要面談者リスト

[大蔵計画省 Department of Finance & Planning ]

- Mr. Gabriel Pepson Assistant Secretary, Foreign Aid Management Division  
海外援助管理課 次官補
- Mr. George Paru A/Assistant Secretary, Foreign Aid Management Division  
海外援助管理課 次官補代理
- Mr. Frank Agaru A/Principal Programme Officer, Foreign Aid Management Division  
海外援助管理課 主任計画官代理
- 鈴木 洋一 Aid Adviser, Foreign Aid Management Division

[森林省 Department of Forests ]

- Mr. Michael Komtagarea Secretary  
次官
- Dr. Simon Saulei First Assistant Secretary, Research Branch Director of FRI  
研究部 第一次官補、森林研究所所長
- Dr. Prem Srivastava Chief Research Officer, Forest Management Research Branch  
森林管理研究部 主任研究官 (Silviculture)
- Mr. C. Konabe Assistant Secretary, Forest Products Research Branch  
林産研究部 次官補 (Timber Technologist)
- Dr. Andrew Amoako Scientific Officer, Forest Products Research Branch  
林産研究部 主任技術士 (Timber Technologist)
- Mr. Karl A. Kerenga A/Officer in charge, Division of Botany, Lae  
レイ植物部 担当官代理 (Botanist)
- Mr. Osia Gideon Researcher, Division of Botany, Lae  
レイ植物部 研究員 (Botanist)
- Dr. Hywel Roberts Officer in charge, National Forest Research Station, Bulolo  
ブロロ国立森林研究所 担当官 (Entomologist)
- Mr. John Muki Researcher, National Forest Research Station, Bulolo  
ブロロ国立森林研究所 研究員 (Forest Pathologist)
- Mr. Neville Howcroft Researcher, National Forest Research Station, Bulolo  
ブロロ国立森林研究所 研究員 (Silviculturist/Tree Breeder)
- Mr. Siagi Kalogo Principal, Forestry College, Bulolo  
ブロロ林業大学長 校長
- Mr. David Skelton Manager, Bulolo Pine Project

ブロボインプロジェクト マネージャー  
 Mr. Venantius Muriki Scientific Officer, Forest Management Research Branch, Madang  
 マダン森林管理研究部 主任技術士 (Plantation Silviculture)  
 Mr. Kaul Tama Vice-Principal, Timber Industry Training College  
 木材産業訓練大学校 教頭

[日本大使館]

飯野 建郎 参事官  
 高島 宏明 三等書記官  
 渡辺 晃久 三等書記官

[JICA事務所]

中野 勝安 所長  
 熊野 明 所員  
 丸田 秀士 協力隊調整員

[その他]

Mr. Sho N. Inoue JOCV, Wau Ecology Institute, Wau  
 井上 尚志 ワウ生物研究所 青年海外協力隊員 (植物学 60/?)  
 Mr. Kingsly Associate Professor, Department of Forestry, University of  
 Tisseverasinghe Technology, Lae  
 レイ工科大学林学部 助教授 (Wood Anatomy)  
 吉田 恭 Hamamas Print, Morobe Women's Association  
 ハママスプリント 青年海外協力隊員 (美術 61/3)  
 平野 克典 University of Technology, Lae  
 レイ工科大学 青年海外協力隊員 (建築 62/3)  
 小川 寿一 創造社 国際部主任  
 (F R I 建設現場 事務所常駐者)

2. 調査の要約

1988年11月5日から11月19日の日程で、パプア・ニューギニアを訪問し、先に述べた無償資金協力及びプロジェクト方式技術協力に関する一連の調査結果並びに協議結果を踏まえ、今後の協力活動の枠組みを決定することを目的とし、プロジェクト実施体制の最終的な確認と、関連機関・施設の現地調査等を実施した。

そして、R/D及びT. S. I.を協議検討し、それぞれに署名締結するとともに、協議の内容についてミニッツを確認事項として残した。

以下に現地調査及び実施協議の内容の詳細を述べる。

### 3. 技術協力の概要

#### 3-1 基本構想

##### 3-1-1 森林省の組織

PNG国における森林省は、大きく分けて、資源研究部、資源開発部、研究部、人材養成部の4部から成っている。(図3-1)

今回の調査は、同国の森林研究に関するプロジェクト方式技術協力の実施を目的とすることから、4部のうち研究部を中心に調査が進められたが、本プロジェクトとの関連機関として、Timber Industries Training College (木材産業訓練専門学校)が人材養成部にあり、これについても調査を行った。

上記4部のうち、研究部は、研究機関の統合により、森林研究所に組織替えの予定である。

##### 3-1-2 森林研究所の組織

現在は、研究部に属する研究機関として、森林管理研究所、林産研究所、植物園の3部門があり、それぞれ次のように各地に分散している。

森林管理研究所：ポートモレスビー、プロロ、マダン

林産研究所：ポートモレスビー

植物園：ポートモレスビー、レイ

これらの3部門は、現在我国の無償資金協力で建設中の森林研究所設立に伴い、4部門(植物部、森林管理部、森林保護部、林産部)に改編される予定である。(図3-2)

各部の活動概要は以下のとおりである。

植物部：分類学、植物標本管理、植物園管理

森林管理部：森林経営、造林、遺伝資源

森林保護部：昆虫学、微生物学、(防火)

林産部：特性、加工

森林研究所のスタッフは、所長1名、副所長1名、森林管理部14名、植物部15名、森林保護部5名、林産部9名、総務課7名の計52名の予定である。(図3-3)

このうち、Ph. D. は、4名と少なく、3人の外国人研究者を除くと、PNG人としては、所長のみである。

##### 3-1-3 プロジェクトの組織

プロジェクトの実施体制は、R/Dに記載のとおり、プロジェクトの総責任者は森林省次官、

実際の運営責任者はプロジェクトマネージャーとしての森林研究所長、その所長に対し技術、管理事項について提言、助言を行うのが日本人チームリーダーである。

また、日本人専門家は、PNG研究者C/Pに技術指導、助言を行う。この他、日本人長期専門家として業務調整員を置き、各種の連絡調整を行うこととしている。

さらに、森林省次官の諮問機関として、ジョイントコミッティーを設置し、年次計画の作成、研究協力のレビュー等を行うこととしている。

ジョイントコミッティーのメンバーは、

①委員 長：森林省次官

②P N G 側：プロジェクトマネージャー（森林研究所長）

大蔵計画省の代表者

T I T Cの代表者

その他関係者

③日 本 側：チームリーダー

日本人専門家

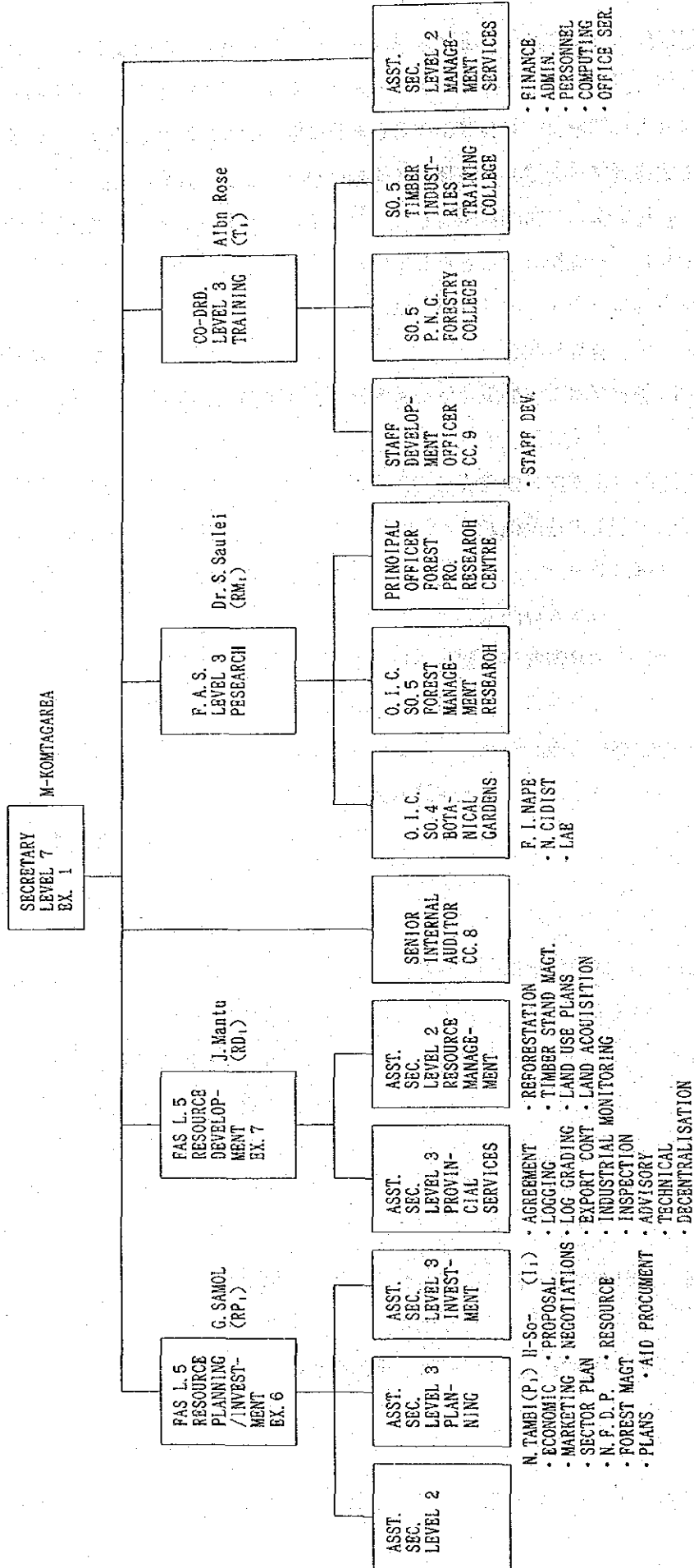
業務調整員

在PNG・J I C A事務所長

その他

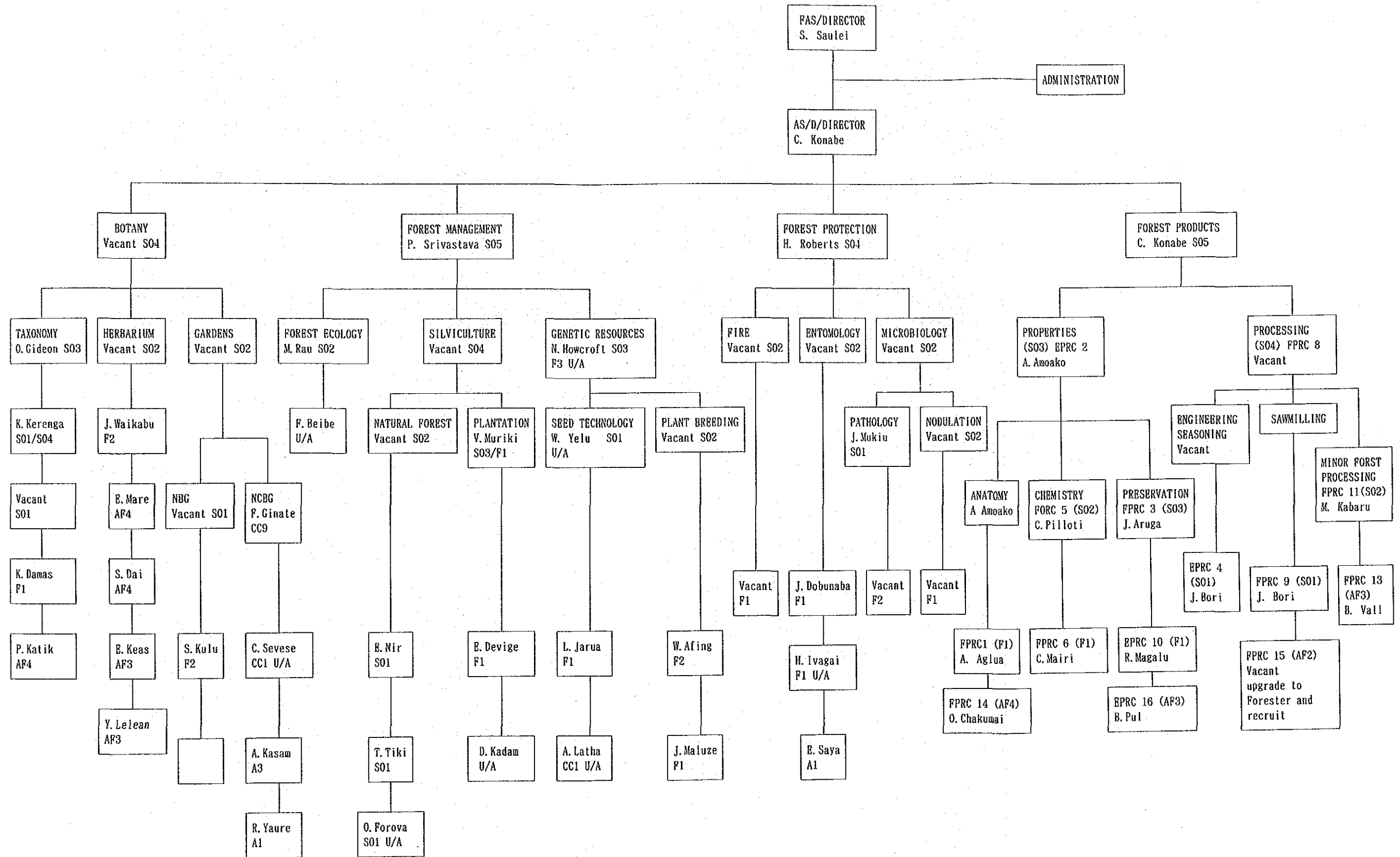
④オブザーバー：在PNG日本大使館担当者

PROPOSED FUNCTIONAL STRUCTURE—DEPARTMENT OF FOREST





FRI PROPOSED STRUCTURE





FRI Staff members

Dr. S Saulei FAS/Director

Mr. C Konabe AS/Deputy Director

A. Forest Management Branch

Dr P Srivastava OIC

Mr W Afing

Mr F Beibe

Mr E Davige

Mr O Forova

Mr N Howcroft

Mr L Jarua

Mr D Kadam

Mr A Latha

Mr J Maluge

Mr V Muriki

Mr E Nir

Miss M Rau

Mr T Tiki

B. Botany Branch

Mr K Kerenga A/OIC

Mr S Dai

Mr K Damas

Mr O Gideon

Mr F Ginate

Mr A Kasam

Mr P Katik

Mrs E Keas

Mr S Kulu

Mr Y Lelean

Mrs E Mare

Mr S Obedi

Mr C Sevese

Mr J Wiakabu

Mr R Yaure

C. Forest Protection

Dr H Roberts

Mr J Dobunaba

Mr H Ivagai

Mr J Mukiu

Mr E Saya

E. Administration

Mrs H Khomu

Mr K Wamau

Mrs M Suru

Mr S Kapera

Miss C Oa

Mrs M So-omba

D. Forest Products

Mr C Konabe

Dr A Amoako

Mrs A Aglua

Mr J Aruga

Mr J Bori

Mrs O Chakumai

Mr M Kabaruu

Mr C Mairi

Mr R Magalu

### 3-2 プロジェクトサイト

#### 3-2-1 プロジェクトサイト

- (1) 森林研究所 本研究所の性格から、ある程度森林地帯に近くしかも試験研究に供する薬品等の補充が容易に行える場所としてレイは適当と考えられる。現在はマラリヤの発生頻度が高く、治安がきわめて悪いという問題を抱えているが、5年あるいは10年先にはこれらの問題も徐々に改善され、町並みの美しさだけでなく生活環境あるいは研究環境として高く評価される日にくることを期待したい。
- (2) 実験林 実験林として使える林は、アローカリアなどの針葉樹を主とする人工林はプロロに、各種の広葉樹を主とする天然林、人工林はオムシスにある。プロロは採種園、種子実験の場所として今後も活用される見込みであり、周辺には様々な林齢の人工林が存在する。これらの人工林はニュージーランドのテコ入れで作られたものであるため、実験林として活用するには何等かの調整が必要であろう。さらにプロロはレイから車で3時間かかるため日帰りの作業は困難であり、実験林を維持管理するためには管理者並びに作業員等が必要になる。これらの点が解決されればプロロの実験林は施業研究のサイトとして適当と考えられる。オムシスの実験林はレイの森林研究所から車で3、40分の距離にあり、足場の良さという点で将来大いに活用されるであろう。現在は10アール程度の苗畑がありその周囲は一部人工広葉樹林、ほとんどは天然生二次林と考えられる。現在は面積、林班の区分等もはっきりしないように思われるので、今後実験林として有効に活用するためには、ある程度の面積に区分し、目的に沿った林班を作成する必要がある。
- (3) 苗畑 PNGスタッフは苗畑用地としてオムシスを考えている。現在その土地の所有権はモロベ州にあるが、森林省森林研究所の実験林苗畑として使用する許可は得られているとのことであった。同地では現在10アール程度の小規模な苗畑で住民に配布する苗木を生産しているに過ぎない。PNGの森林規模を考慮し、また実際に森林研究所が動き出したとすると最低でも1、2ヘクタール程度の苗畑が必要になると予想される。従って、将来苗畑用地を拡大整備する必要があると考えられるが、同地にある作業員の住居を移動させて苗畑用地の拡大を計るにしても、林地を切り開いて拡大を計るにしてもいずれにしてもかなりの整備費が必要であろう。また森林研究所の隣接地には現在は苗畑用地はまったくないが、将来小規模の苗畑実験は同所敷地内で出来るようにする方が効率的と考えられる。PNGスタッフの個人的な意見として1、2ヘクタール程度であればボタニカルガーデンの敷地を苗畑に転用することは可能であるとのことであった。森林研究所の隣接地にも一部苗畑を整備する方が望ましい。
- (4) シードバンク シードバンクはニュージーランドの補助でプロロに施設が整備されている。プロロの周辺には採種園もあり種子研究のサイトとしては好適な環境にある。従って森林研究所発足後も種子研究はプロロで継続される予定であり、レイへの移転は考えられていない。森林研究所内に作られている種子研究関連施設はPNGスタッフの説明では種子貯蔵を行う上での

貯蔵施設のトラブルを考慮して危険分散のために作ったとのことであった。

### 3-2-2 関係機関

#### (1) TITC (木材加工訓練専門学校)

この学校は長期調査員報告書に記載のとおり (P. 48~50)、製材、木材加工、木材防腐等の商業生産のための技術者の短期養成を行っており、設備・機材も上記の目的に対応した大型のものが設置されている。従ってFRIの研究との関連では、実用試験には利用出来ると考えられる。現在同校では木材の基礎的な物理的性質(比重、伸縮性、強度等)についての講義、実験は一切行っていないので、FRIでこれらの試験データが集積されれば、商業生産に対するより明確な指針を与えることが出来るであろう。

校長は、現在Mr. Kaul Tamaである。

#### (2) UNITECH (技術大学)

調査員報告書 (P. 8~9)、この大学には林学部が設置されていて、学部は4年制でおおむね日本の大学の林学科に相当する教育を行なっている。林産学に関する教育はここではほとんど行なわれていないので、FRIにおける林産学の研究は、ポートモレスビーにあるUPNG (ババア・ニューギニア大学) の理科系学部の卒業生によって行なわれている。

### 3-2-3 国際援助機関の動向

今回の調査では下記の3機関による研究プログラムが実施されている旨回答があり、本プロ技とは直接の関係はないと思われるが、その詳細については今後さらに調査が必要である。

#### (i) Natural regeneration in lowland forests

UWDP/FAO (1987.4~1989.4)

#### (ii) Rattan resource management & research

IDRC/UNDP (1989~91)

#### (iii) Alternative shifting cultivation & agroforestry

IDRC (1988.10~1989.9)

## 3-3 協力計画

### 3-3-1 研究協力の分野と背景

#### (1) 林業研究の協力分野

a. 育苗、植栽および保育に関する研究 低海拔地における天然更新技術に関する研究ならびにラタン資源の管理と研究については現在FAO、UNDP、IDRCの基に研究が継続されており、それらが終了するまでは森林研究所での研究協力体制は取りにくいと判断される。アローカリアを主要樹種とする人工林については前述の通りプロロで事業並びに研究が進められているが、今後森林研究所で取り上げるとすれば植栽密度等を考慮した省力的造林技術に関連する研究、二代目の造林地におけるローテーションに関連する研究が重要と考えられ

- る。このほかPNG国全体として伐採跡地に樹木を植栽する技術並びに研究は乏しいと考えられるので、有用樹種の育苗植栽保育に関する研究は近い将来重要になると予想される。従ってレイにおいてもその研究協力体制を取る必要がある。
- b. 主要樹種の種子技術に関する研究 種子技術については前述のようにプロロにおいてかなりの研究実績がある。従って以前の長期調査員の報告とは異なるがPNG国としてはこの分野の研究協力の要望は低い。レイの森林研究所の建物には種子研究用の実験室も含まれているので、研究者さえ配置されれば研究を開始できる体制にはあるが、PNG国ではこれまでニュージーランドから派遣された研究者と予算(?)でこの分野の研究を行ってきたため、日本の研究協力については調整を必要としよう。
- c. 土壌分類及び土地生産力に関する研究 PNG国ではこれまで森林土壌に関する研究は皆無に等しい。しかし土壌研究の重要性は認識しており、研究協力の要望は極めて高い。今回の調査では土壌部門についてもカウンターパートはいつでも配置できる体制にあるとの事であった。会議の席では日本側は土壌部門は広い意味で造林部門に含まれ造林部門の中で土壌の専門家を派遣できる可能性もあると説明してきた。
- d. 森林昆虫及び防虫法に関する研究 この分野の研究は森林昆虫の分類とマツの食葉害虫の天敵ウイルスに関する研究、カメレレのキクイムシ被害に関する研究、造林木の白アリ被害に関する研究など限られた分野ではあるがロバート博士を中心に進められており、わが国に対する研究協力の要望は現時点では低い。
- e. 森林病害に関する研究 カメレレ等の樹木に各種の心材腐朽被害が見出され、その被害の大きさから腐朽病害に関する研究協力の要望が高い。また防腐研究分野からの腐朽菌の同定技術の研究協力、造林研究分野からの根粒菌の接種技術についての研究協力、椎茸栽培技術についての研究協力と各方面からの要望が強い。日本では樹病研究分野、キノコ研究分野、土壌微生物研究分野に細分化されているので1人の専門家で全てをカバーすることは困難であろう。またPNG国としてはPNGスタッフが海外留学するため、その留守中の担当を希望するとの要望であったが、技術の移転を行うとの立場からは専門家の派遣期間に注意を要しよう。
- f. この他気づいた点 PNG国の森林研究に関連することとして次のような点に気づいた。まず研究レベルについてであるが、オーストラリア等外国の研究者が訪れて直接研究指導した分野についてはかなり高い研究レベルにあると感じられた。しかしその他の分野では、これから研究を始めるところと理解した方がよい。従ってこれらの分野での研究協力はまず基本的な手法のトレーニングを行い、次にPNG国の森林研究課題を設定し、共同研究を通じて技術の移転を計る方法が望ましいと判断された。
- g. 機材供与 機材供与についての基本的な考え方として、既存の機材、無償供与機材を総合して判断し、効率よく研究が進められるよう不足する機材の補充を計る。このほか例えば土

壤研究分野などあらたに開始される研究分野については日本の研究者の判断である程度のレベルの研究を進めるに当たって必要とする機材の拡充を計る。この観点にたって個々の研究室に配置される機材等についてみると以下にあげる機材が不足すると判断される。

電子顕微鏡関係……臨界点乾燥機、イオンコーター

昆虫関係……実態顕微鏡写真撮影装置、その他昆虫専門家に照会中

樹病関係……シャーレ、試験管、シリコン栓、その他ガラス器具類

土壌関係……土壌専門家に照会中

その他試験用ガス類、薬品類の補充体制……ガス類についてはほぼ入手できるが水素ガスについては不明、聴き取り調査によると薬品類もほぼ入手できる模様。

専門家の派遣要望分野 専門家の派遣要望の強い分野としては1989年当初から派遣予定の林産研究分野、種子研究分野以外に土壌研究分野、樹病研究分野、植物分類研究分野、生物統計分野があげられた。

カウンターパート研修 カウンターパートの研修に関連してG N P国からカウンターパートが研修を受けた後は修士または博士のデグリーを得られるよう考慮して頂きたいとの強い要望が出された。

## (2) 林産研究協力の分野

### a. 現状（長期調査員報告書P.143～144を参照。）

木材保存に関連して、保存薬剤の効力検定、木材の鑑定、木材標本の配布、保存処理木材の適性利用に関する情報提供を林産研究センター（ポートモレスビー）で行っている。

### b. F R I の組織と業務概要（報告書P.154～159を参照。）

化学研究室：木材保存薬剤および処理木材の分析

特用林産物研究室：用材として用いられる以外の林産物についての調査研究（マングローブの生態、用途などの調査、コパール、ラタンなどの特用林産物に関する情報センター）

木材保存研究室：以上および海中での木材保存に関する調査研究

木材加工研究室：従来は Gogol 地域産材からのMDF（中比重繊維板の製造）—ニュージーランド資金援助、PNG材からのパルプ・紙製造試験—オーストラリアCSIROに依頼等を行って来ており、情報センターの趣きが強い。

木材組織研究室：木材の識別、木材の性質、市場性、分布などの情報センター

### c. プロジェクトの項目と年次計画

（調査員報告P.159～を参照。）

長期調査員による調査時点でのプロジェクトに関わる林産研究の研究項目は次のとおりであった。

木材の強度的性質（物理的性質を含む）

PNGの主要樹種および未利用樹種についてのデータ集積

#### 木材乾燥の研究

PNGでは未だこの研究は行われたことがない。基礎的実験→乾燥技術の確立、製造に関する研究

PNGでは未だこの研究は行われたことがない。基礎的実験、PNGの製材技術水準の調査→製材技術の向上

研究遂行に当っては、TITCとの連携を密にする必要がある。

#### 追加要請課題

##### 木材腐朽に関する研究

木材腐朽菌（ソフトロットを含む1の分離同定）

木材の化学的性質の研究

PNGの有用樹種および未利用樹種の木材化学成分一覧表の作成

上記の研究分野はいずれも今回締結されたR/Dの協力活動分野に含まれており、11月16日に手交されたFRI研究組織（付表）にも対応研究室名が存在するので、支障なく研究は進展し得るものと考えられる。なお、11月11日レエで行われた会議の席で、PNG側から林産研究分野で特に重要性の指摘された、木材腐朽に関する研究、木材加工（強度的性質・物理的性質）に関する研究、木材の化学的性質の研究もすべて上記の研究分野に含まれているので、プロジェクト実施上特に問題はないと思われる。

#### d. 専門家派遣

##### ○ 木材化学 長期専門家

木材化学に関する基本的事項の指導を行い、研究面では木材の化学組成の分析法を確立させる。

##### 短期専門家

必要に応じて機器分析、抽出成分の分離同定等の指導が必要であろう。

##### ○ 木材防腐 長期専門家

今回PNG側から要請されているのは、木材腐朽菌（ソフトロット）の分離同定であり、林業関係においてもカメレレ生立木の心材腐朽等木材腐朽菌の分類専門家が求められているので、両者をカバー出来る専門家の派遣が適当であろう。

##### ○ 木材強度 短期専門家

引張り、圧縮、剪断等木材の基本的強度試験法の確立について指導を行う。

##### ○ 木材乾燥 短期専門家

木材乾燥についての基本的事項の指導を行い、将来は太陽熱利用乾燥室の設置等も考えられている。

現在PNG側から要請されている専門家派遣分野は上記のとおりであるが、プロジェクト開始後は、林産関係長期派遣専門家とPNG側カウンターパートと充分協議を行い、適当分



野に複数の短期専門家の派遣を行うことが妥当であろう。

林産関係の協力分野は、さきの調査報告書にも記載のとおり、従来最も組織的に活動を行って来た林産研究センターがFRIの林産部になるので、FRIとして組織が動き始めても順調に研究が進められるものと思われる。

また研究方針はかなりしっかりしたものが既に策定されており、これに加えて木材の強度、物理的性質、化学的性質、製材、乾燥等の新規分野については長期、短期専門家の指導の下にJIS、JASに相当するPNGとしての試験法の確定を含む基礎的データの集積を行うことにより、PNG材の有効利用について重要な基礎的資料が得られることになる。

e. 機材供与

以下に無償資金協力によって供与された機材に関し、実験室ごとにその配置状況を参考に記す。

○ 気象観測室 (49) - 気象関係器具			
2-1~15, 2-13 百葉箱を除く			
○ 電気定温乾燥器			total
地図・測量実験室 (50)	1		
組織培養実験室 (51)	1		
種子実験室 (53)	3		5
○ 電気送風乾燥器			
種子実験室 (53)	1		
土壌物理実験室 (54)	2		3
インキュベータ			
昆虫実験室 (森林) (64)	3		
" (林産) (65)	3		6
○ 卓上遠心器			
樹病実験室	1		1
○ 卓上型冷却遠心器			
組織培養実験室	1		
樹病実験室	1		2
○ 緑葉面積計			
地図・測量実験室	1		
○ 植物体内水分張力測定器 (Pressure chamber)			
組織培養実験室	1		2
○ 恒温発芽試験器 (TG-10)			
種子実験室	1		

		total
	特種林産実験室	1 2
○	恒温発芽試験器 (TG-20)	
	種子実験室	1
	特種林産実験室	1 2
○	定温恒温発芽試験器	
	種子実験室	1
	特種林産実験室	1 2
○	超定温フリーザー	
	樹病実験室	1
	腐朽実験室	1
	昆虫実験室 (林産)	1
	殺虫剤実験室	1 4
○	冷蔵庫	
	地図・測量実験室	1
	種子実験室	1
	土壌物理実験室	1
	樹病実験室	1 4
○	薬用保冷库	
	組織培養実験室	1
	種子実験室	1
	腐朽実験室	1
	木材組織実験室	1 4
○	マイクロトーム (F型滑走式)	
	樹病実験室	1 1
○	マイクロトーム (大型回転式)	
	樹病実験室	1 1
○	土壌滅菌装置	
	滅菌室/きのこ実験室	1 1
○	化学天秤	
	天秤室	4 4
○	化学天秤	
	天秤室	3
	地図・測量実験室	1 4

		total
○ ダブルビーム分光光原計		
土壤物理実験室	1	1
○ pH 計 (HM26-S)		
種子実験室	1	
化学実験室	1	2
○ pH 計 (HM16-S)		
土壤物理実験室	1	
化学実験室	2	3
○ ガラス器具		
部屋番号28	1	
○ 種子選別器 (air screem)		
種子実験室	1	1
○ 恒温振盪培養器 (TA-60T)		
滅菌室/きのこ実験室	1	1
○ 恒温振盪培養器 (TA-100T)		
木材組織実験室	1	1
○ オートクレーグ (HL-42Ae)		
組織培養実験室	1	1
○ オートクレーグ (H-88LL-D)		
化学実験室	1	1
○ ダイアフラム真空ポンプ		
化学実験室	1	1
○ 回転式真空ポンプ		
化学実験室	1	1
3-23~26 土壤関係電機		
土壤物理実験室		
○ キールダール分析装置 (VS-FA-1)		
化学実験室	1	1
○ キールダール分析装置 (VS-KT-P)		
化学実験室	1	1
○ 室内育苗器		
種子実験室	2	2

		total
○ 電気マッフル炉		
特種林産実験室	1	
○ 木材万能試験機		
建材性能実験室	1	1
○ 走査型電子顕微鏡		
電子顕微鏡室	1	1
○ 製水器		
化学実験室	1	1
○ イオン交換純水製造装置		
組織培養実験室	1	
化学実験室	1	2
○ ホットプレート (HPL-1)		
組織培養実験室	1	
木材組織実験室	1	
化学実験室	1	3
○ ホットプレート (HPL-4)		
組織培養実験室	1	
化学実験室	2	3
○ ロータリーエバポレータ		
組織培養実験室	1	1
○ ロータリーエバポレータ・プロセスコントローラ		
組織培養実験室	1	1
○ 電磁式篩振盪器		
土壌・物理試験室	1	
特種林産実験室	1	2
○ ガスクロマトグラフ		
土壌物理実験室	1	1
○ 木材水分計		
建材性能実験室	1	
木材組織実験室	1	2
○ 恒温水槽		
組織培養実験室	1	
滅菌室/きのこ実験室	1	

		total
化学実験室	1	3
○ 恒温振盪水槽		
上に同じ		3
○ 万能攪拌器		
化学実験室	1	1
○ Somic homogenizer		
木材組織実験室	1	1
○ ホモジナイザー		
木材組織実験室	1	1
○ 双眼顕微鏡 (SZ-3-W)		
地図・測量実験室	1	
組織培養実験室	1	
種子実験室	1	3
○ 双眼顕微鏡 (SZ-TR-W)		
樹病実験室	1	
昆虫実験室 (森林)	1	
" (林産)	1	
昆虫標本室	1	4
○ 顕微鏡 (BHTU-312)		
樹病実験室	1	
腐朽実験室	1	
昆虫標本室	1	3
○ 顕微鏡 (BHT-312)		
種子実験室	1	1
○ 全自動洗浄器		
実験器具洗浄室	1	1
○ 電気乾燥滅菌器		
実験器具洗浄室	1	1
○ 台秤		
特種林産実験室	1	1
3-58~61 付属器具		
○ キミロメータ		
建材性能実験室	1	1

total

○ 土壤水分計		
土壤物理実験室	1	
○ クリーンベンチ		
組織培養実験室	1	1
○ 土壤透水分析装置		
土壤物理実験室	1	1
○ 木材防腐剤注入装置		
experimental treatment plant	1	1

種子、組織培養、土壤物理、化学実験室に重点的に配置されているように感じられる。

万能強度試験機

木造防腐剤注入装置

- プロジェクト発足以降の機器供与については本リストを参照の上、研究担当者と充分打合せを行って選定することが望ましい。

#### 4. PNG側の準備状況、プロジェクト実施体制

##### 4-1 予算措置

森林省全体の予算額は、1987年は4.5百万キナ（720百万円（1キナ=160円として算出））、1988年は4.9百万キナ（784百万円）、1989年は5.6百万キナ（896百万円）となっている。

また、FRI全体の新規予算は、0.20百万キナ（32百万円）となっているが、この内訳及び森林省の研究部の予算の推移についても今後さらに調査する必要があると思われる。

本プロジェクトの予算は特別計上されていない。したがって、上記FRIの予算から支出されることになると思われる。しかし、今回の協議の際、本ミッションの再三のプロジェクト予算確保努力の要請にもかかわらず、PNG側は、施設、スタッフの移転並びに無償で建設中の森林研究所の施設整備等に多額の費用を要することを繰り返すのみであり、具体的な移転計画の作成も成されていない状況であることから、作成次第送付させることとしたが、いずれにしても予算不足は今後の大きな課題であると思われる。

（しかしながら、別の提出資料表4-1によれば、

- ① 人員、施設移転用の費用として1988年

3～5万キナ

- ② 森林研究所施設のうち無償資金協力で整備される研究室、テーブル、戸棚等を除く机、椅子等の整備費として、1989年

3万キナ

③ ゲストハウスの家具整備として、

6.5万キナ

が予算化あるいは見込まれている。)

#### 4-2 C/Pの確保

C/Pの予定者は表4-2のとおりであるが、特にこのなかで1989年度(プロジェクト協力期間初年度)から長期専門家が派遣されるSeed Technologyの分野のMr. C. PillotiとWood Technologyの分野のMr. W. Yeluが現在オーストラリアに留学中であり、1989年のプロジェクト開始までには帰国予定とのことであるが、今後さらに確認する必要がある。

また、C/P予定者はすべて、学位または修士を持っている。

今回、C/Pのもう少し詳細な資料を要求したにもかかわらず、氏名のみにとどまったので今後提出させる必要がある。

#### 4-3 移転計画

PNG側が考えている施設、スタッフの移転計画は以下のように、(表4-3)

森林管理部門	1989年	4月～6月
植物部門	”	10月～12月
森林保護部門	”	7月～10月
林産部門	”	4月～6月

と計画されているが、厳しい予算事情、住宅不足等から推測すると、スケジュール通りの移転は困難視される。

なお、現在すべての研究施設がレイに移転するわけではなく、プロロのシードセンター、マダンのプランテーションは現在のまま残すように計画されている。

したがって、日本人専門家の派遣に合わせた施設及び前述したC/Pの移転について、今後さらにPNG側と緊密な連絡調整を図りながら進める必要がある。

(FRI所長より提出された資料表4-1)

#### 3. Budget

	1987	1988	1989
1. TOTAL:	4.5	4.9	5.6 million
2. FRI:	—	—	200,000
3. PROJECT:	—	—	NIL

(FRI 所長より提出された資料表 4-2)

Counterpart Candidates

1. Project Manager: Dr S Saulei Director FRI or  
Mr C Konabe D/Director FRI

2. Counterpart's Field of Specialization

A. Silviculture

(i) Natural Forest - Mr E Nir

(ii) Plantation - Mr O Forova

(iii) Soils - Mr V Muriki

(iv) Nursery - Mr W Yelu\* or Mr L Jarua

B. Seed Technology - Mr W Yelu\*

C. Forest Pathology - Mr J Mukiu

D. Forest Products

(i) Wood Preservation - Mr C Konabe or Mr J Aruga

(ii) Chemical Properties - Ms C Pilloti\*

(iii) Physical & Mechanical Properties - Ms A Aglua

(iv) Seasoning & Sawmilling - Mr J Bori & Mr J Mamum\*

(v) Forest Minor Products - Mr M Kabaru

All officers nominated as counterparts either have BSc, MSc or Diploma in Forestry. Others with an \* are either doing BSc or MSc internally or overseas. Their present positions with FRI are Scientific Officers (of various grades: 1-4 depending on their qualifications and experiences).



(F R I 所長より提出された資料表 4 - 3)

#### 4. Planned transfer Schedules

	J.	F.	M.	A.	M.	J.	J.	A.	S.	O.	N.	D.
FMB	.....											
BOT.									.....			
BP									.....			
FPR	.....											

5、6、& 7 (See attached Notes).

#### 4 - 4 無償資金協力との関係

現在建設中の森林研究所の施設、ゲストハウスは、わが国の無償資金協力 (1988年1月11日 E / N 締結) により行なわれており、現時点では工事は予定通り進行している。

工事完了、施設機材等引渡しは1989年3月15日の予定であり、これに合わせて日本人専門家を派遣するのが機械の管理・操作を考慮した場合に望ましいと思われるが、本ミッション派遣時には、種々の事情から協力開始時期は1989年4月1日とされている。

また、プロ技のスキームによる機材供与に当たっては、無償による供与機材の周辺機器等の整備内容を把握した上で行なう必要がある。

#### 4 - 5 宿舎の確保

森林研究機関のスタッフ数は、1987年61名 (National 55名、Overseas 6名) で、その8割が官舎に住んでおり、僅か3名が持家である。

このスタッフは、1988年には63名が大蔵計画省により認められ、2000年には75名になると見込まれている。

宿舎の必要数については、63名の総スタッフ数のうち、

14名：すでにレイ市に居住中 (その殆どはワントークと同居)

13名：ポートモレスビー市の植物園7名、プロロのシードセンターの4名、マダンの造林研究の2名は在留予定とされているため、

1989年36名、2000年までには、48名分が必要とされている。

現在建設中のゲストハウス24戸のうち、今回のR/D協議により5戸 (3LDK) を日本人専門家用として確保したため、残りの19戸についてはPNG側がすべて使用することが想定されるが (注-1)、その場合であっても全体の住宅不足数は1989年17戸、2000年までには29戸となる。

したがって、1989年には high convenient house を6戸、low convenient house を11戸、2000年までには、さらにそれぞれ4戸、8戸、が必要とされている。

そのための土地としては、現在ゲストハウス24戸が建設されているTITC構内敷地で不足する場合は、TITCの向いの政府所有地を予定しているようである。

(注-1) 24戸のうち1LDKが10戸あり、うち5戸を外国人guest researcher用として使用することも検討されてはいる。

## 5. 実施協議内容

今回のR/D協議では、日本側から事前にR/D案をPNG側へJICA事務所へ提示した上で、来パした。この日本側案についてPNG側からは資料5-1が、当初の協議において提出され、このパ側の質問文と日本側R/D案をもとに数回の協議が重ねられた。

また、先にも述べた本技術協力の概要に関する調査にも関係し、事前にパ側へ質問事項を連絡しており、これに対する回答もDr Snavstava (これまでの日本との交渉経緯に関わってきた研究者) から資料5-2として提出されたので、これも参考とした。

### 5-1 研究協力内容

我が方からは協力活動分野として

林業研究 (育苗・植栽・保育、種子技術、土壌分類・土地生産力、森林昆虫・防除法、樹病)

林産研究 (木材保存、化学的特性、物理的・機械的特性、乾燥・製材技術)

を、さらに長期専門家として、上記の中から造林、種子、森林病虫害管理、木材工学の4名を派遣すること、さらに、上記協力活動分野の範囲内で必要に応じ短期専門家を派遣することを提示した。

これに対し、PNG側は、pathologist, soil, botanical taxonomy, wood chemistry, wood engineering, wood preservation, biostatisticsの分野に対する協力要請を強く主張した。

pathologist, soil, wood chemistry, wood engineering, wood preservationは、我が方が提示した協力の枠組の中で長期あるいは短期によりその対応の検討が可能であるとした。(特に、soilの要望が強く、geed technology よりも高い優先順位をつけている。)

また、その他の、botanical taxonomyは協力の枠組の外ではあるものの、コンタクト・ミッション時ミニッツの4分野の1つになっていることから(特に、植物分類についてはオーストラリアの協力が得られなくなったため、今回も我が方に要請してきたもの)、今後のR/Dの追記も含め検討課題として持ち帰ることとしミニッツに残した。

biostatistics については研究手法の一つであることから要請分野からは外した。

上記の協力活動分野の中で特に、種子技術の長期専門家の派遣については、レイ市から約120km離れたプロロにシードセンターがあり、重点的に研究が進められている上に、プロロに残留する予定であることから、レイ市とプロロの研究内容のデマケに留意しつつ慎重に対処する必要がある。

なお、レイ市郊外にはOomsisに（F R Iから約30分間）、モロベ州の苗畑があり今後かなり整備を要するものの、森林省担当官の話によると使用可とのことである。

#### 5-2 宿舎問題

本協議において、森林研究協力プロジェクトでありながら残念なことに最も時間を費したのが、この住居のことであった。

我が方主張の長期専門家用3LDK5戸、短期専門家用1LDK2戸に対し、PNG側は、初年度目の長期専門家用3戸のみで充分であること、予算事情が厳しいことを繰り返し、平行線をたどった。

これに対し、我が方も短期についてはホテル住いも可能であると判断し、最終的には3LDK5戸のみに譲歩し双方合意に達しミニッツに明記した。

一応合意には達したものの、初年度目には5戸のうち2戸については全くの空家とするか、短期専門家が居住するか、移転を伴うC/Pの住居問題ともからみ相当深刻な課題である。

#### 5-3 移転計画、予算措置

本プロジェクトの実施のため、優先的に、C/P、スタッフ、施設の移転を行うこと、予算確保のために努力するよう再三要請し、その旨ミニッツに残すこととしたが、その実効のためには今後ともさらに緊急な連絡、指導助言が必要である。

#### 5-4 実験林、苗畑の整備

今回の調査で、実験村、苗畑のための適当な土地の有無を確認したが、レイの森林研究所附近（現植物園も含む）、ウムシスのモロベ州所有の苗畑、プロロと候補地を選定した。

このうち、プロロはレイからの日帰りが困難であることから、前二者を整備対象地とした（ウムシスの苗畑、その周辺林の使用は森林省森林研究所長（1989年4月から）によると、モロベ州の許可が得られる見込である。）。

また、この整備はプロジェクト基盤整備費の使用の検討を約し、ミニッツに残した。

#### 5-5 その他

以上の他、協議の際に議題となったことについて触れることとする。

##### (1) R/D The Attached Document II-2-(4)

Free local medical services and facilitiesについては、PNG側が予算不足のため履行できないと説明したのに対し、我が方は、本プロジェクトは、コロンボプランに基づく技術協力であり、専門家の医療サービスも当然被援助国において負担して欲しいこと、また、仮にそれが困難な場合であってもこの項目は削除する訳にはいかないこと、さらに事実上鈴木洋一

専門家等の場合のように専門家が自己負担することを説明し、了承された。

(日本人専門家の派遣に当たって、A<sub>1</sub>フォームの一括要請の方法について、Dr. Sanlei F R I 所長、Dr. Srirastava 森林管理市長の両者に1989年2月までに日本に到着するように提出すること及び提出前にはJICA事務所と相談するよう説明した。)

- (2) R/DⅢの機器供与について PNG側からメンテナンスの費用を負担して欲しい旨要請があったが、我が方は現在の援助スキームではできないこと、将来の検討課題にはなりうることを説明し、了承された。

(機器供与のためのA<sub>1</sub>フォームの一括要請方法について前述の二者に説明したが、その提出前にはPNG側の研究計画とその必要とする機械について日本側と連絡調整することとした。今後早急に対処する必要があると思われる。)

- (3) R/DIVの研修受入れについて PNG側から、MS、Ph.D取得の可否について質問があり、我が方から現JICAのプロ技協カスキームでは出来ないが、JICA 枠留学生受入れ制度があることを情報として伝えた。また、第三国(欧米)での研修の可能性について、無い旨を伝えた。

- (4) R/DVのC/Pと事務職員については、移転等各種の困難な状況にあるも、日本人専門家に対し必要なC/Pは確保するというPNG側の説明に対し、我が方は当初ミニッツに記載することとしていたが、R/Dの表現を超えるものではないことから、ミニッツからは割愛した。またC/Pの留学等は認められるかとの問に対し、日本人専門家に対し少なくとも常時1人以上確保されれば問題はないとした。

- (5) R/DVIのPNG政府が取るべき措置

ア. VI-1-(2)のany other materialsについては研究用の丸太、材等の試材料の安定的供給を要請し、PNG側も即答、確約したことからその供給は可能であると判断しミニッツからは外した。

イ. VI-1-(3)のtravel allowanceについては、PNG側は予算不足から困難であるとし日本側の負担を強く要請したが、我が方も、鈴木専門家が実際に旅費を支給されている例を挙げ、プロジェクトに必要な旅費についてはPNG側で負担して欲しい旨説明し、この条項は残すことで合意したが、事実上、我が方の負担もかなりの程度必要になろう。

ウ. VI-1のPNG政府が必要な措置をとる際、森林省を通じて実施することから、through the Department of Forests を挿入したいこと、さらに、VI-2-(2)のcustoms duties, internal taxes and any other chargeonについては森林省の管轄外であることを理由にVに2の後に3として移動したい旨の要望があったが、前者の語句の挿入にはwith laws and regulations in force in PNGの語句に、政府が森林研究に関する行政行為を行う場合は森林省を通じて行うということが含まれること、後者についてはここに予算関連の項目をまとめていることから、いずれも原文通りにしたい旨回答し了解を得た。

また、ここで重ねてR/Dの性格に触れ、実施機関同士が合意後、両国政府に勧告するという趣旨を再確認した。

エ. R/DⅦのプロジェクト管理についてはPNG側から、本プロ技の最終責任者について質問があり、我が方は、森林省事務次官であること、さらに日本人チーム・リーダーは必要な提言、助言をすることをつけ加えた。

オ. R/DⅧの日本人専門家に対するクレームについては、PNG側から同国の法件に従って欲しい旨要請があり、交通事故の場合等について触れたが、日本人専門家は犯罪を犯しに来るのではなく技術移転に来ることを強調し、また他のJICA専門家と同様の取扱いにして欲しい旨説明し、了解された。

#### 5-6 TSIについて

今回のTSIについて、その変更の可否に関する質問があり、今後、Joint Committee 等での協議、検討により可能であるが、今回はこれでSignしたい旨説明し了承された。

ISSUES WHICH NEED PARTICULAR ATTENTION FOR MEETING DISCUSSION

1. Papua New Guinea meeting the cost of the following:-

- (i) Free medical services
- (ii) Travel allowance
- (iii) Transport of personal effects
- (iv) Claims against law breakers
- (v) Rent for accomodation

2. Training

Priority should be given to PNG officers getting post graduate degrees. This means that refresher courses for counterparts in Japan would have second priority.

3. Activities

List of activities as listed in the master plan be modified to match the list of experts required by PNG.

Priority areas for PNG:

- 1. Pathologist
- 2. Soil
- 3. Botanical taxonomy
- 4. Wood Chemistry
- 5. Wood engineering
- 6. Wood preservation
- 7. Biostatistics

4. Equipments

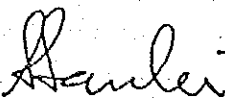
JICA to provide equipment not found in FRI but are necessary for the project, with funds for their maintenance.

5. Facilities

JICA to assist in constructing required facilities for the project (e.g. nursery & green house).

6. Project Counter parts

Personnels are available within the present FRI structure.

  
DR. S. SAULEI

10th November 1988

(Dr. Svivastavaより回答のあった資料 資料5-2)

ANNEX IV

PRELIMINARY QUESTIONNAIRE RESPONSES

1. The transfer of three branches of the Division of Research, Dept. of Forest namely the Forest Products at Port Moresby, Entomology & Pathology at Bulolo, and Silviculture from Madang and Bulolo will be implemented to LAE as soon as the FRI facilities are handed over to PNG Government by JICA. However, the smooth transfer will depend upon the availability of houses as accomodation is one of the main limiting factors.
2. Attached are: (i) the present structural organisation of the Department and (ii) the Research Division.

The Research Division has four Branches which include the following:-

1. Forest Management
2. Botany
3. Protection
4. Forest Products.

The Division is headed by the FAS (Director) with four Branch heads and twelve sectional heads, excluding the botanical gardens.

3. The present aid projects will continue until their further considerations (2-3 years). The following are the existing projects:-

<u>Project</u>	<u>Funding Agency</u>
(i) Forest Management: Resource & Development (Natural Regeneration in lowland forests)	UNDP/FAO
(ii) Rattan resource management & research	IDRC/UNDP
(iii) Alternative shifting Cultivation & Agroforestry	IDRC



4. COMMENTS OF THE R/D AND TSI

(A) Attachment of Japanese experts and their families. One of the major problems which FRI will face in getting these experts and their families is that of accomodation. At present FRI has 24 units of accomodation of which five will be reserved for overseas single visitors; unless funds are injected into accomodation FRI will not be able to provide such families with accomodation.

FRI will be faced with the problem of accomodating both national and contract officers.

(B) There is no such arrangements for free medical services and facilities to either the present contract officers or volunteers thus all have to meet such expenses.

(C) Training of PNG Counterparts in Japan will be implemented, but that options be left open for nationals to be trained also elsewhere.

(D) Transportation and travel allowances for Japanese experts will depend on the availability of funds otherwise such request will not be met by PNG. No budgctey allowance

(E) All running expenses for the project will be met by the funds budgeted for such items.

(F) Claims against Japanese experts will have to be discussed with the Foreign Affairs Dept.

(G) Project activities

- There does not seem to be any activity on Botanical functions, especially in taxonomy, herbaria and gardens which are as important as the other activities; thus needs to be included.

- Other activities such as

1. Five protection

2. General forest ecology and dynamics which should include: phenological studies, growth rates, pollination, etc.

3. Micro-organisms e.g. Rhizobium etc.

(H) Joint Committee

(i) Composition

Should also include representatives of the Research Council.

(I) Identification of PNG Counterparts

SUBJECT: ESTABLISHMENT ON FOREST RESEARCH INSTITUTE

1. OBJECTIVES

The main objective of the project is to establish a Forest Research Institute in Lae which will coordinate all forestry research in the country. The Japanese Government agreed to provide a grant aid for the construction of the institute building, a few houses for the staff and essential equipment. With the completion of the facilities in Lae, most of the research staff and equipment will move to F.R.I.

2. PRESENT STATUS OF THE PROJECT

2.1 N.E.C. Approval

The National Executive Council approved the project in its Meeting No. 15/86 (dated 29 April 1986) in its Decision No. 42/86 as Japanese grant aid to Papua New Guinea.

2.2 B.P.C. Approval

The Budget Priority Committee gave its approval to this project in its letter dated 13 October 1987 (Ref: 2-8-2 (6) 215-03-302).

2.3 Progress of the Project

A number of Missions from Japan visited the country and held extensive discussions with the officials of the concerned Departments, such as, Department of Finance and Planning, Department of Works, Department of Forests, Lae Town Planning Committee and Lae City Interim Commission. The details of these missions are as follows:

- First Mission - Preliminary Study Team  
26 Feb. 8 March 1987.
- Second Mission - Technical Cooperation Contact  
Team.  
1-11 June 1987.
- Third Mission - Basic Design Study Team.  
18 July - 10 August 1987.
- Fourth Mission - Draft Final Report Team.  
28 October - 6 November 1987.
- Fifth Mission - Submission of final report  
and signing of Exchange of  
Notes.  
January 1988.
- Sixth Mission - A 4-members mission from PNG  
visited Japan to witness the  
tendering process and finalise  
the project.  
March 1988.

The construction of the Institute building was started in April 1988. The project is right on schedule. The facilities are expected to be handed over to the PNG Government in April 1989. A copy of the building is enclosed. A model of the F.R.I. building is kept in Forest Product Research Branch.

### 3. PROJECT COMPONENTS

There are 4 aid components of the project, viz;

- 3.1 Construction of the F.R.I. building which will house laboratories, a library, exhibition hall, a lecture hall and administration offices. Other supporting facilities include a biological control laboratory, insect house, pressure treatment plant, chemical stores, generator room, workshop, garage and a greenhouse.

### 3.2 Accommodation

Type A	3 bedroom	2 houses
Type B	3 bedroom	12 houses
Type C	1 bedroom	10 houses
	Total	= <u>24 houses</u>

### 3.3 Essential equipment.

### 3.4 Technical Cooperation which will include:-

- (i) guest researchers/experts from Japan;
- (ii) training of nationals in specific fields in Japan; and
- (iii) supply of other essential equipment especially needed by the incoming researchers/experts from Japan.

The first technical cooperation mission will be in the country during 6-18 November 1988.

## 4. COST OF THE PROJECT

### 4.1 Aid Components

The total cost of the project is about K13 million. It has tremendously increased from 1981-82 estimates of about K5-6 million due to: (i) appreciation of yen, and (ii) the cost of accommodation component (24 houses) which was not included in the original proposal.

### 4.2 PNG Government Contribution

Besides meeting small parts of the project during the construction phase, for which, the B.P.C. (RMC) has approved K70,000 in 1988, the main expenditure of the Government would be in the following items:-

- (i) Funds for transfer of personnel and equipment (in 1988)

It would be probably in the range of 30-50 thousand kina.

- (ii) Furnishing of the main building  
The permanent fixtures (such as, Laboratory tables, sinks, etc), will be provided by the grant aid, but other items, such as tables, chairs, etc., will be the responsibility of the host government. Some of these requirements will be met from the existing facilities. An amount of K30,000 has been estimated for this purpose in 1989 budget.
- (iii) Furnishing of the houses being built by Japanese aid  
A total of K65,000 (at the rate of K3,000/3-bed house and K2,300 for 1-bed house) is needed.
- (iv) Management Cost  
Significant rise in the management cost (items 2-9) of the new facilities is not expected).
- (v) Extra Staff Housing  
(See below).

## 5. HOUSING NEEDS

This is the most critical part as far as the contribution of the PNG Government is concerned. The project on the establishment of a Forest Research Institute will not be successful if suitable accommodation is not provided to the staff which will be moved from Port Moresby, Bulolo and Madang.

### 5.1 Present Staff

In 1987, there were 61 staff in the Research Division, 55 national officers and 6 overseas officers (based in Port Moresby, Bulolo, Lae and Madang). About 80% of the staff are residing in government accommodation, including those in Baku (Madang) who share Provincial Government quarters. Only

three have their own houses. In 1988, a ceiling of 63 staff is given by the Department of Finance & Planning; 57 national officers and 6 overseas officers. On a conservative scale, if a 15% increase in staff is envisaged by the year 2000, there would be a total of 75 staff members in the Division.

#### 5.2 Staff to be moved to Lae (FRI)

According to the schedule drawn up by the JICA, the F.R.I. building will be ready in April 1989.

Out of 63 staff, 14 are already staying in Lae (Botany Branch staff) although the majority of them are living with their wantoks, and 7 members of the NCD Botanical Garden will remain in Port Moresby. At the same time, it is planned that 4 officers at Bulolo and 2 at Madang will be retained to manage the newly built national seed centre (in Bulolo) and monitor other projects on the ground. Thus a total of 36 officers will need accommodation in 1989 and 44 by the year 2000.

#### 5.3 JICA Contribution

The Japanese Government has agreed to build 24 houses on our persistent request, as an exception to their grant aid principles. There will be 14 high covenant 3-bedroom and 10 high covenant 1-bedroom houses. The single bed houses, according to JICA are meant for guest researchers from Japan and other countries. However, it is not envisaged that there will be 10 guest researchers at any time during 1989-90. At the most we expect 4-5 guest researchers during this period. Thus 5 houses may be made available on the condition that they have to be vacated for the guest researchers when needed.

Thus, out of 36 officers, 19 will be accommodated in these houses. That would leave a shortage of 17 houses in 1989-90 and 29 by the year 2000.

5.4 Types of additional houses needed

According to present indications, 6 high covenant and 11 low covenant houses will be needed when the FRI is established. There will be an additional need of 4 high covenant and 8 low covenant houses by the year 2000.

5.5 Availability of Land

The land is available. The 24 houses being built by the Japanese Government are located in TITC Campus. If enough space is not available in TITC campus for additional houses, they can be built in the government land opposite the TITC campus. According to Lae Town Planning Committee, presently there is no pressure for this land by any other government department.

6. B.P.C. APPROVAL

The B.P.C. (RMC) in its letter of 8 January 1988 (2-8-2 (6)/215-03-322) has approved K1.4 million for item 5 above which is spread over 1989-1995. A total of K315.2 is estimated for this purpose in 1989 budget.

M. KOMTAGAREA  
Secretary



- 資料 5 - 3 R/D
- 資料 5 - 4 T S I
- 資料 5 - 5 ミニッツ
- 資料 5 - 6 R/D (和文)
- 資料 5 - 7 日本側案資料

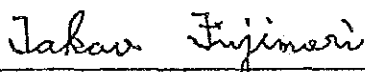
THE RECORD OF DISCUSSIONS  
BETWEEN THE JAPANESE IMPLEMENTATION SURVEY TEAM  
AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF  
PAPUA NEW GUINEA  
ON THE JAPANESE TECHNICAL COOPERATION  
FOR THE FOREST RESEARCH PROJECT IN PAPUA NEW GUINEA

The Japanese Implementation Survey Team ( hereinafter referred to as "the Team" ) organized by the Japan International Cooperation Agency ( hereinafter referred to as "JICA" ) and headed by Dr. Takao Fujimori, Director, Silviculture Section, Forestry and Forest Products Research Institute, visited Papua New Guinea from November 6, 1988 to November 18, 1988 for the purpose of working out the details of the technical cooperation program concerning the Forest Research Project in Papua New Guinea.

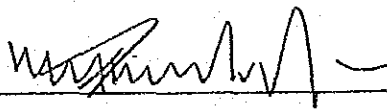
During its stay in Papua New Guinea, the Team exchanged views and had a series of discussions with the Papua New Guinea authorities concerned on desirable measures to be taken by both Governments for successful implementation of the above-mentioned project.

As a result of the discussions, the Team and the Papua New Guinea authorities concerned agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

Port Moresby, Papua New Guinea.  
November 16, 1988



Dr. Takao Fujimori  
Leader,  
Implementation Survey Team,  
Japan International Cooperation  
Agency

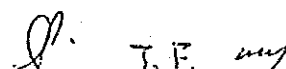


Mr. Michael Komtagarea  
Secretary,  
Department of Forests,  
Papua New Guinea

Witnessed by



Mr. Gabriel Pepson  
Assistant Secretary,  
Foreign Aid Management Division,  
Department of Finance & Planning,  
Papua New Guinea



THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Japan and the Government of Papua New Guinea will cooperate with each other in implementing the Forest Research Project ( hereinafter referred to as "the Project") at the Forest Research Institute in Lae for the purpose of promoting research activities on reforestation, forest protection and effective utilization of forest products, and thus contribute to the sustainable development of forest resources in Papua New Guinea.

2. The Project will be implemented in accordance with the Master Plan given in Annex I.

*Handwritten initials* T.F. *and*

## II. DISPATCH OF JAPANESE EXPERTS

1. In accordance with laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense the services of Japanese experts as listed in Annex II through normal procedures under the Colombo Plan Technical Cooperation Scheme.
2. The Japanese experts referred to in 1 above and their families will be granted in Papua New Guinea privileges, exemptions and benefits no less favorable than those accorded to experts of third countries working in Papua New Guinea under the Colombo Plan Technical Cooperation Scheme, and will include the following:
  - (1) Exemption from income taxes and charges of any kind imposed on or in connection with the living allowances remitted from abroad in relation to implementation of the Project;
  - (2) Exemption from import and export duties and any other charges imposed on personal and household effects which may be brought in from abroad or taken out of Papua New Guinea;
  - (3) Exemption from import taxes, import sales taxes, sales taxes and other taxes and charges of any kind imposed on or in connection with the purchase in Papua New Guinea by the Japanese experts of one motor vehicle per expert;
  - (4) Free local medical services and facilities for the Japanese experts and their families.

### III. PROVISION OF MACHINERY AND EQUIPMENT

1. In accordance with laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense such machinery, equipment and other materials necessary for implementation of the Project as listed in Annex III, through normal procedures under the Colombo Plan Technical Cooperation Scheme.
2. The articles referred to in 1 above will become the property of the Government of Papua New Guinea upon being delivered C. I. F. to Papua New Guinea authorities concerned at the ports and/or airports of disembarkation, and will be utilized exclusively for implementation of the Project in consultation with the Japanese experts referred to in Annex II.

### IV. TRAINING OF PAPUA NEW GUINEA PERSONNEL IN JAPAN

1. In accordance with laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to receive at its own expense the Papua New Guinea personnel connected with the Project for technical training in Japan through normal procedures under the Colombo Plan Technical Cooperation Scheme.
2. The Government of Papua New Guinea will take necessary measures to ensure that the knowledge and experience acquired by the Papua New Guinea personnel from technical training in Japan will be utilized effectively for implementation of the Project.

#### V. SERVICES OF PAPUA NEW GUINEA COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. In accordance with laws and regulations in force in Papua New Guinea, the Government of Papua New Guinea will take necessary measures to secure at its own expense the necessary services of Papua New Guinea counterpart and administrative personnel as listed in Annex IV.
2. The Government of Papua New Guinea will allocate the necessary number of suitably qualified personnel corresponding to each Japanese expert to be dispatched by the Government of Japan as specified in Annex II for effective and successful transfer of technology under the Project.

#### VI. MEASURES TO BE TAKEN BY THE GOVERNMENT OF PAPUA NEW GUINEA

1. In accordance with laws and regulations in force in Papua New Guinea, the Government of Papua New Guinea will take necessary measures to provide at its own expense:
  - (1) Land, buildings and facilities as listed in Annex V;
  - (2) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for implementation of the Project other than those provided through JICA under III above;
  - (3) Transportation facilities and travel allowance for the official travel of the Japanese experts within Papua New Guinea;
  - (4) Suitably furnished accommodations for the Japanese experts and their families.
2. In accordance with laws and regulations in force in Papua New Guinea, the Government of Papua New Guinea will take necessary measures to meet:
  - (1) Expenses necessary for the transportation of articles referred to in III above, within Papua New Guinea, as well as for the installation, operation and maintenance thereof;
  - (2) Customs duties, internal taxes and any other charges imposed in Papua New Guinea on the articles referred to in III above;
  - (3) All running expenses necessary for implementation of the Project.

## VII. ADMINISTRATION OF THE PROJECT

1. The Secretary of the Department of Forests will bear overall responsibility for implementation of the Project.
2. The Director of the Forest Research Institute, as the Project Manager, will be responsible for administrative and managerial matters of the Project.
3. The Japanese Team Leader will provide necessary recommendations and advice on technical and administrative matters concerning implementation of the Project to the Project Manager.
4. The Japanese experts will give necessary technical guidance and advice to Papua New Guinea counterpart personnel on matters pertaining to implementation of the Project.
5. For effective and successful implementation of the Project, a Joint Committee will be established with the functions and composition as referred to in Annex VI.
6. The Project will be implemented in collaboration with relevant organizations in line with the organization chart as shown in Annex VII.

## VIII. CLAIMS AGAINST JAPANESE EXPERTS

The Government of Papua New Guinea undertakes to bear claims, if any arise, against the Japanese experts engaged in the Project resulting from, occurring in the course of, or otherwise connected with, the discharge of their official functions in Papua New Guinea except for those arising from the willful misconduct or gross negligence of the Japanese experts.


## IX. MUTUAL CONSULTATION

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with, this Attached Document.

## X. TERM OF COOPERATION

The duration of technical cooperation for the Project under this Attached Document will be five (5) years from April 1, 1989.



T.F. 

## A N N E X

### I. MASTER PLAN

#### 1. Objectives of the Project

The objectives of the Project are to promote the research activities of reforestation, forest protection and effective utilization of forest products at the Forest Research Institute, and thus to contribute to the sustainable development of forest resources in Papua New Guinea.

#### 2. Activities of the Project

To attain the above-mentioned objectives, the following cooperation activities will be implemented.

##### (1) Forestry Research on

- (a) Nursery practice, planting and tending
- (b) Seed technology of major species
- (c) Soil classification and soil fertility
- (d) Forest entomology and insect control method
- (e) Forest pathology

##### (2) Forest Products Research on

- (a) Wood preservation
- (b) Chemical properties of major and lesser-known species
- (c) Physical and mechanical properties of tree species
- (d) Wood seasoning and sawmilling techniques



## II. JAPANESE EXPERTS

1. Team Leader
2. Experts in the fields of:
  - (1) Silviculture
  - (2) Seed technology
  - (3) Management of forest pests
  - (4) Wood technology
3. Liaison Officer

Note: 1. Team Leader may serve concurrently as an expert in one of the fields mentioned above.

2. Short-term experts will be dispatched when the necessity arises for smooth implementation of the Project.

*Op.* TE *my*

### III. LIST OF EQUIPMENT

#### 1. Equipment and machinery necessary for:

(1) Research on forestry

(2) Research on forest products

#### 2. Books and other necessary printed matters

#### 3. Vehicles and their spare parts

#### 4. Other materials necessary for implementation of the Project.

*SP.* TE *mm*

#### IV. LIST OF PAPUA NEW GUINEA COUNTERPART AND ADMINISTRATIVE PERSONNEL

##### 1. Counterpart personnel

- (1) Project Manager
- (2) Counterpart experts in the field of:
  - (a) Silviculture
  - (b) Seed technology
  - (c) Management of forest pests
  - (d) Wood technology

##### 2. Administrative personnel

- (1) Clerical and service employees
- (2) Drivers and laborers
- (3) Other necessary supporting staff

Note. 1. The Papua New Guinea side will assign at least one (1) suitably qualified Papua New Guinea research personnel corresponding to each long/short term expert to be dispatched from Japan.

2. The Project Manager may nominate the Deputy Project Manager when the necessity arises for smooth implementation of the Project.

3. The number of staff mentioned under 2 above will be adjusted as and when required.

V. LIST OF LAND, BUILDINGS AND FACILITIES

1. Land for:

- (1) Nurseries
- (2) Experimental forests
- (3) Other related facilities if necessary

2. Buildings and facilities

(1) The Project Office and related facilities in the premises of the Forest Research Institute

- (a) Project Office
- (b) Laboratories and lecture rooms
- (c) Warehouse for forestry materials
- (d) Garage

(2) Field facilities for research and survey

- (a) Experimental forests
- (b) Nurseries
- (c) Seed Bank

(d) Facilities for forest products in the premises of the Timber Industry Training College

(3) Other related buildings and facilities for effective implementation of the Project.

H. T.R. my

## VI. THE JOINT COMMITTEE

### 1. Functions

The Joint Committee, composed of those members listed under 2 below, will meet at least once a year and whenever necessity arises, and work:

- (1) To formulate the Annual Work Plan of the Project in line with the Tentative Schedule of Implementation formulated under the framework of this Record of Discussions;
- (2) To review the overall progress of the technical cooperation program as well as the achievements of the above-mentioned Annual Work Plan;
- (3) To review and exchange views on major issues arising from or in connection with the technical cooperation program.
- (4) To submit reports containing their findings and recommendations to the Department of Forests and JICA.

### 2. Composition

#### (1) Chairman

Secretary of the Department of Forests

#### (2) Members

##### 1) Papua New Guinea side:

- a) Project Manager
- b) Representative of the Department of Finance and Planning
- c) Representative of the Timber Industries Training College
- d) Other personnel concerned with the Project

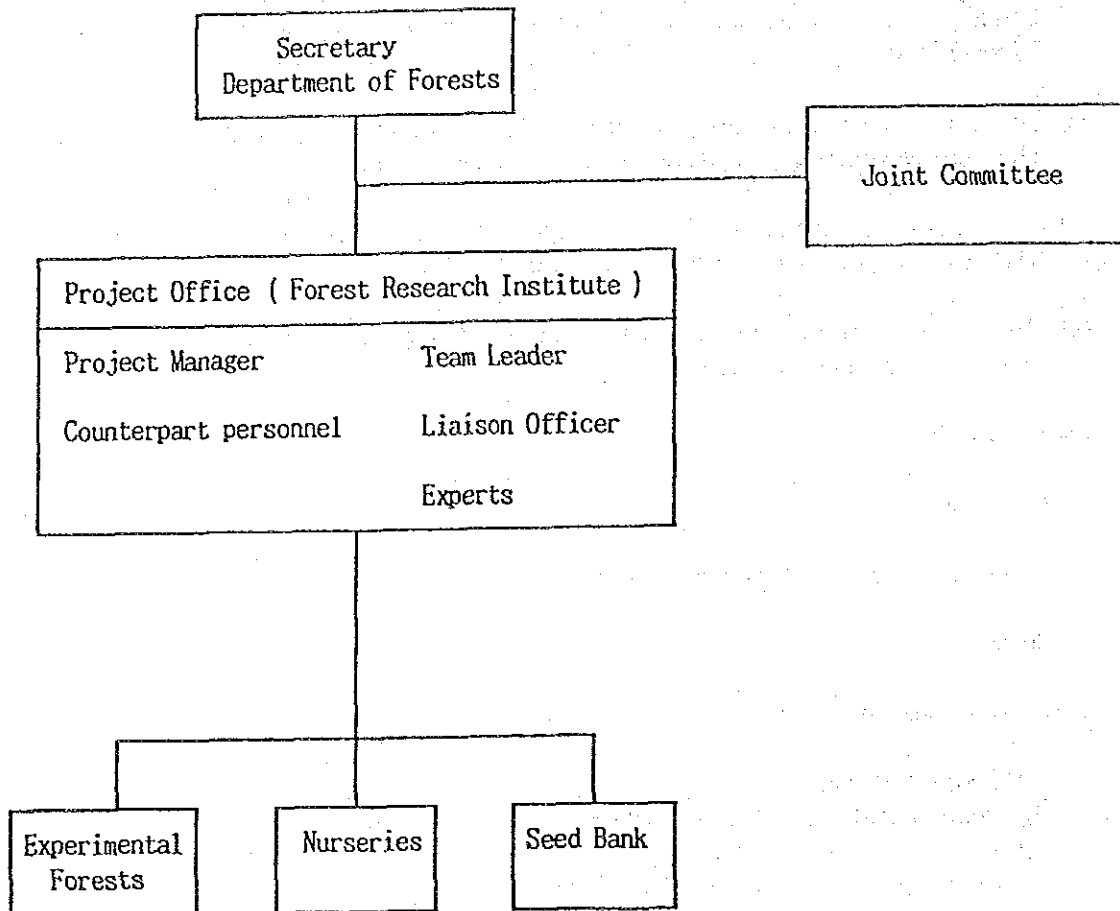
##### 2) Japanese Side:

- a) Team Leader
- b) Expert(s) designated by the Team Leader
- c) Liaison Officer
- d) Resident Representative of JICA in Papua New Guinea
- e) Personnel concerned to be dispatched by JICA, if necessary

Note: Official(s) of the Embassy of Japan may attend the Joint Committee as observer(s).

*Q.* T.F. my

VII. ORGANIZATION CHART FOR IMPLEMENTATION OF THE PROJECT



*SP.* T.F. *my*

TENTATIVE SCHEDULE OF IMPLEMENTATION  
OF  
THE FOREST RESEARCH PROJECT  
IN  
PAPUA NEW GUINEA

The Japanese Implementation Survey Team and the authorities concerned of the Government of Papua New Guinea have jointly formulated the Tentative Schedule of Implementation of the Forest Research Project ( hereinafter referred to as " the Project" ) at the Forest Research Institute in Lae as annexed hereto.

This has been formulated in connection with the Attached document of the Record of Discussions signed between the Japanese Implementation Survey Team and the authorities concerned of the Government of Papua New Guinea for the Project on the condition that the necessary budget will be allocated for implementation of the Project by both sides, and that the above-mentioned Schedule is subject to change within the framework of the Record of Discussions, when the necessity arises, in the course of Project implementation.

Port Moresby, Papua New Guinea  
November 16, 1988

Takao Fujimori

Dr. Takao Fujimori  
Leader,  
Implementation Survey Team,  
Japan International  
Cooperation Agency

Michael Komtagarea

Mr. Michael Komtagarea  
Secretary,  
Department of Forests,  
Papua New Guinea

Witnessed by

Gabriel Pepson

Mr. Gabriel Pepson  
Assistant Secretary,  
Foreign Aid Management Division,  
Department of Finance & Planning  
Papua New Guinea

*SP* *my* T. F.

Item	Year	1st	2nd	3rd	4th	5th
<p>I. Research activities of the Project</p> <p>1. Forest Research on</p> <p>(1) Nursery practice, planting and tending</p> <p>(2) Seed technology of major species</p> <p>(3) Soil classification and soil fertility</p> <p>(4) Forest entomology and insect control method</p> <p>(5) Forest pathology</p> <p>2. Forest Products Research on</p> <p>(1) Wood preservation</p> <p>(2) Chemical properties of major and lesser-known species</p> <p>(3) Physical and mechanical properties of tree species</p> <p>(4) Wood seasoning and sawmilling techniques</p>						



Item	Year	1st	2nd	3rd	4th	5th
<p>II. Dispatch of Japanese experts</p> <p>1. Team Leader</p> <p>2. Experts in the fields of:</p> <p>(1) Silviculture</p> <p>(2) Seed technology</p> <p>(3) Management of forest pests</p> <p>(4) Wood technology</p> <p>3. Liaison Officer</p> <p>III. Provision of Equipment</p>						

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FE

Item	Year	1st	2nd	3rd	4th	5th
IV. Training of Papua New Guinea personnel in Japan						
V. Papua New Guinea personnel						
I. Counterpart personnel						
(1) Project Manager						
(2) Counterpart experts in the field of:						
(a) Silviculture						
(b) Seed technology						
(c) Management of forest pests						
(d) Wood technology						

T.F.

*[Handwritten signature]*

Item	Year	1st	2nd	3rd	4th	5th
2. Administrative personnel						
(1) Clerical and service employees						
(2) Drivers and laborers						
(3) Other necessary supporting staff						
VI. Land, buildings and facilities						
VII. Allocation of running costs						

*Sp. my*

T. E.

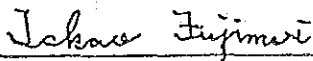
THE MINUTES OF MEETING ON THE RECORD OF DISCUSSIONS  
BETWEEN THE JAPANESE IMPLEMENTATION SURVEY TEAM  
AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF  
PAPUA NEW GUINEA  
ON THE JAPANESE TECHNICAL COOPERATION  
FOR THE FOREST RESEARCH PROJECT IN PAPUA NEW GUINEA

The Japanese Implementation Survey Team ( hereinafter referred to as "the Team" ) organized by the Japan International Cooperation Agency ( hereinafter referred to as "JICA" ) and the authorities concerned of the Government of Papua New Guinea agreed upon and signed the Record of Discussions ( hereinafter referred to as "the R/D" ) on the Japanese technical cooperation for the Forest Research Project in Papua New Guinea.

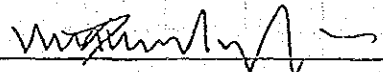
Understandings reached between both sides are referred to in the document attached hereto in order to clarify some specific matters concerning the R/D.

Port Moresby, Papua New Guinea

November 16, 1988

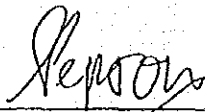


Dr. Takao Fujimori  
Leader,  
Implementation Survey Team,  
Japan International Cooperation  
Agency

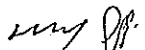


Mr. Michael Kontagarea  
Secretary,  
Department of Forests,  
Papua New Guinea

Witnessed by



Mr. Gabriel Pepson  
Assistant Secretary,  
Foreign Aid Management Division,  
Department of Finance & Planning,  
Papua New Guinea

T.F. 

## THE ATTACHED DOCUMENT

1. In order to ensure smooth implementation of the Project, the Papua New Guinea side will make utmost efforts to move preferentially the counterparts, administrative personnel and research equipment necessary for the Project from the existing Research Institutes ( the Forest Management Research Branches in Port Moresby, Bulolo, Madang, the Forest Products Research Branch in Port Moresby and the Botany Branches in Lae, Port Moresby ) to the Forest Research Institute in Lae before April 1989.

2. The Papua New Guinea side will provide five (5) 3LDK residential units within the compound of the Timber Industries Training College in Lae for the Japanese experts and their families.

3. The Papua New Guinea side will make utmost efforts to secure an adequate budget for smooth implementation of the Project.

4. The Papua New Guinea side strongly requested dispatch of Japanese experts in the fields of soil science, forest pathology, wood chemistry, wood engineering and wood preservation within the range of the Project activities referred to in ANNEX I. 2. , and of botanical taxonomy outside of the range.

In response, the Team resolved to consider the request as a topic of future examination and to convey the fact of the request to the Japanese Government.

5. The Papua New Guinea side will secure the lands at Oomsis in the suburbs of Lae, close to the FRI and other suitable lands for experimental forests and nurseries.

6. The Papua New Guinea side strongly requested that the Japanese side would implement improvements of the physical infrastructures of the Project at its own expense, such as establishment of experimental forests and nurseries.

In response, the Team resolved to consider the request as a topic of future examination and to convey the fact of the request to the Japanese Government.

バブア・ニューギニア森林研究計画のための技術協力に関する日本側実施  
協議チームとバブア・ニューギニア政府関係当局との討議議事録

国際協力事業団（以下「JICA」という）が組織し、藤森 隆郎を団長とする日本側実施協議チーム（以下「チーム」という）はバブア・ニューギニアにおけるバブア・ニューギニア森林研究計画についての技術協力計画の詳細を策定するため1988年11月 6日より1988年11月18日までの日程をもってバブア・ニューギニアを訪問した。

バブア・ニューギニア滞在期間中チームは上記プロジェクトの有効な実施のため両国政府がとるべき必要な措置に関してバブア・ニューギニア側当局と意見を交換し、一連の討議を行った。

討議の結果、チームとバブア・ニューギニア側関係当局はそれぞれの政府に対しここに添付する附属文書に記載する諸事項について勧告することに同意した。

ポートモレスビー、バブア・ニューギニア

1988年11月16日

(日本側団長署名)  
国際協力事業団  
実施協議調査団  
団長 藤森 隆郎

(相手国側代表署名)  
バブア・ニューギニア  
森林省次官  
Michoel Komtagerea

連署人

(相手国側副署名)  
バブア・ニューギニア  
大蔵計画省次官補  
海外援助担当  
Gabriel Pepson

(和 文)

## 附 属 文 書

### I 両国政府の協力

1. 日本国政府とバブア・ニューギニア政府は、ラニ森林研究所において、森林資源の造成、保全及び木材の有効利用に関する研究協力を行ないバブア・ニューギニアの森林資源の持続的な開発に資することを目的とし、バブア・ニューギニア森林研究計画（以下「当該プロジェクト」という）の実施において相互に協力を行う。
2. 当該プロジェクトは附表Ⅰの基本計画に基づいて実施される。

### II 日本人専門家の派遣

1. 日本国において施行されている法律および規則に従い、日本国政府は、コロンボ・プラン技術協力計画の通常手続により附表Ⅱに掲げる日本人専門家の役務を自己の負担において提供するため、JICAを通じ必要な措置をとる。
2. 上記1項にいう日本人専門家及びその家族は、コロンボ・プラン技術協力計画のもとにバブア・ニューギニアにおいて専門家活動に従事する第三国専門家に与えられている特権、免除及び便宜に比べ、それに劣らないものを与えられ、また、それらは以下のものを含むものとする。
  - (1) 当該プロジェクト実施に関与し、海外から送金される報酬に対して、またはそれに関連して課せられる所得税及びその他の課徴金の免除。
  - (2) 海外から持ち込むまたはバブア・ニューギニアから持ち出す専門家及びその家族の個人的使用品に課せられる輸出入関税及びその他の課徴金の免除。
  - (3) 1専門家に対し1車両につき、バブア・ニューギニア国内の購入に対して、またはそれに関連して課せられる輸入税、輸入売上税、売上税及びその他の課徴金の免除。
  - (4) 日本人専門家及びその家族に対し、無料医療サービスと便宜。

### Ⅲ 機材供与

1. 日本国において施行されている法律および規則に従い、日本国政府は、コロombo・プラン技術協力計画の通常手続きにより附表Ⅲに掲げる当該プロジェクト実施に必要な資機材を自己の負担において供与するため、JICAを通じ必要な措置をとる。
2. 上記1項にいう機材は、陸揚の港あるいは空港にてバブア・ニューギニア側当局へCIF建てにて引渡される時、バブア・ニューギニア政府の財産となる。そして、それらの機材は附表Ⅱに掲げる日本人専門家との協議をもって当該プロジェクトの実施のためのみに使用される。

### Ⅳ 研修員受入

1. 日本国政府において施行されている法律及び規則に従い、日本国政府は、コロombo・プラン技術協力計画の通常手続きにより日本における技術研修のため当該プロジェクトに関係するバブア・ニューギニア人を自己の負担において受入れるため、JICAを通じ必要な措置をとる。
2. バブア・ニューギニア政府は、相手国人が日本における技術研修から得た知識及び経験が当該プロジェクト実施のため有効に用いられることを保証するために、必要な措置をとる。

### Ⅴ バブア・ニューギニア人カウンターパート及び事務職員の役務

1. バブア・ニューギニアにおいて施行されている法律及び規則に従い、バブア・ニューギニア政府は、附表Ⅳに掲げるバブア・ニューギニア人カウンターパート及び事務職員の役務を自己の負担により保証するため、必要な措置をとる。
2. バブア・ニューギニア政府は、当該プロジェクトのもとで技術の移転を効果的かつ成功裡に行うため、附表Ⅱに定めた日本国政府より派遣される個々の日本人専門家に対応する適切な資質の人員を必要数配置する。

### Ⅵ バブア・ニューギニア政府のとるべき措置

1. バブア・ニューギニアにおいて施行されている法律及び規則に従い、バブア・ニューギニ



ア政府は、自己の負担において次のものを提供するために、必要な措置をとる。

- (1) 附表Vに掲げる土地、建物及び附帯施設
  - (2) 上記Ⅲ条のJICAを通じて供与される機材以外で、当該プロジェクト実施に必要な機械、装置、器具、車輛、工具、補充部品及びその他の物品の調達もしくは取替
  - (3) パプア・ニューギニア国内における公務出張にかかわる日本人専門家に対する交通の便宜及び旅費
  - (4) 日本人専門家及びその家族に対する適当な家具付住居施設
2. パプア・ニューギニアにおいて施行されている法律及び規則に従い、パプア・ニューギニア政府は、次の経費を負担するために必要な措置をとる。

- (1) 上記Ⅲ条に掲げる機材のパプア・ニューギニア国内における輸送、据付、操作及び維持に必要な経費
- (2) 上記Ⅲ条に掲げる機材に対するパプア・ニューギニア国内で課される関税、国内税及びその他の課徴金
- (3) 当該プロジェクトの実施に必要な全ての運営費

## VII プロジェクト管理

1. 森林省次官は、当該プロジェクトの実施について全責任を負う。
2. 森林研究所所長は、プロジェクトマネージャーとして、当該プロジェクトの管理及び運営について責任を負う。
3. 日本人チームリーダーは、当該プロジェクトのリーダーに対して、当該プロジェクトの実施に関する技術面及び管理面の事項について、必要な指導及び助言を与える。
4. 日本人専門家は、パプア・ニューギニア人カウンターパートに対して、当該プロジェクトの実施に関して必要な技術指導及び助言を与える。

5. 当該プロジェクトを効果的かつ成功裡に実施するため、附表VIに掲げる機能及び構成による合同委員会が設置される。
6. 当該プロジェクトは附表VIIに示す組織図に沿って、関係機関と協力し、実施される。

#### VII 日本人専門家に対する請求（クレーム）

バブア・ニューギニア政府は、日本人専門家のバブア・ニューギニア国内における職務の遂行に起因し、または、その遂行中に、または、その遂行に関連して発生する日本人専門家に対するクレームが生じた場合には、そのクレームに関する責任を負う。但し、日本人専門家の故意または重大な過失により生ずる責任については、この限りではない。

#### IX 相互協議

両国政府は、本附属文書から生ずる、あるいは、本附属文書に関連する主要事項について相互協議を行う。

#### X 協力期間

本附属文書に基づく当該プロジェクトの技術協力期間は、本討議議事録の署名日より5年間とする。

附表 I	基本計画	
附表 II	日本人専門家	
附表 III	機材リスト	
附表 IV	バブア・ニューギニア側スタッフのリスト	
附表 V	土地、建物及び附帯施設のリスト	
附表 VI	運営委員会	
附表 VII	プロジェクト実施組織図	