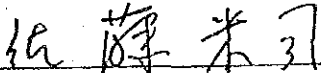


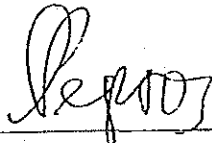
2. Scope of Work

SCOPE OF WORK
FOR
THE STUDY
ON
THE PORT MORESBY WATER SUPPLY DEVELOPMENT PLAN
IN
PAPUA NEW GUINEA
AGREED UPON BETWEEN
THE GOVERNMENT OF
THE INDEPENDENT STATE OF PAPUA NEW GUINEA
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

PORT MORESBY, PAPUA NEW GUINEA
APRIL 14, 1992



Prof. Yoneji Sato
Leader,
Preparatory Study Team
JAPAN INTERNATIONAL
COOPERATION AGENCY



Mr. Gabriel Pepson
Director,
Office of International
Development Assistance
DEPARTMENT OF FINANCE
AND PLANNING



Mr. Frank John Igo
Chairman,
NATIONAL CAPITAL
DISTRICT COMMISSION



1. INTRODUCTION

In response to the request of the Government of Papua New Guinea (hereinafter referred to as "P.N.G."), the Government of Japan decided to conduct the Study on the Port Moresby Water Supply Development Plan in Papua New Guinea (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of P.N.G.

The National Capital District Commission (hereinafter referred to as "NCDC"), shall act as counterpart agency to the Japanese study team (hereinafter referred to as "the Team") and the Office of International Development Assistance (hereinafter referred to as "OIDA") shall play as coordinating body at the national level in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

The present document sets forth the scope of work with regard to the Study.

2. OBJECTIVES OF THE STUDY

The objectives of the Study are :

- 1) To formulate a master plan for the rehabilitation and expansion of the existing water supply system in the National Capital District for the next twenty years,
- 2) To formulate immediate remedial measures of the existing water

for P.N.G. J

supply system in the National Capital District.

- 3) To carry out a feasibility study of the project selected with the high priority in the master plan.

3. STUDY AREA

The Study will cover the area of the National Capital District and its surrounding areas in the Central Province.

4. SCOPE OF THE STUDY

1) Outline of the Study

The Study comprises the following two(2) phases.

Phase I : Master Plan and Immediate Remedial Measures

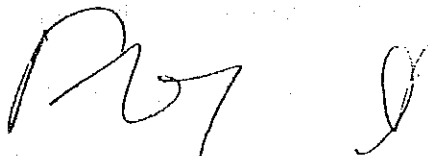
Phase I-1. Master Plan

The study in this phase I-1 will include review and analysis of available data and information, survey of existing water supply system and survey of water resources.

On the basis of the results of survey and analysis mentioned above, service area, population in the service area and forecasted water demand for the next twenty years will be determined, and the alternative plans for development of water supply will be examined to formulate a master plan. A high priority project to be followed up by feasibility study will be identified in the Master Plan.

Phase I-2. Immediate Remedial Measures

The Immediate Remedial Measures for restoration of existing system and facilities will be studied in this phase.

34 

Phase II : Feasibility Study

The Feasibility Study for the high priority project identified in Phase I-1 and/or Phase I-2 will be carried out.

2) Items of the Study

Phase I-1 : Master Plan

(1) Data collection and analysis

- * Socio-economic conditions
- * Natural conditions
- * On-going water supply projects and other relevant projects
- * Water supply plans and studies
- * Socio-economic development plans and studies
- * Topographical, geological and hydrological maps
- * Data on meteorology, hydrology and geology
- * Organization for operation & maintenance
- * Financial condition for management

(2) Study of existing water supply system

- * Review of design criteria
- * Review and analysis of structure, capacity and performance of water supply facilities
- * Water flow and pressure measurement
- * Water leakage measurement
- * Institution
- * Operation & maintenance
- * Water charge collection system
- * Financial condition

(3) Study of water resources

- * Hydrological analysis
- * Water quality analysis
- * Sectorial water allocation of water resource

ha PWS J

- * Availability of alternative water source
- * Study of intake site

- (4) Strategies for water supply development

- (5) Determination of the service area
 - * Existing service area
 - * Proposed service area
 - * Priority of the area to be developed

- (6) Determination of the population in the service area

- (7) Water demand projection and allocation
 - * Determination of daily consumption per capita for domestic use
 - * Determination of commercial and industrial water consumption
 - * Forecasting of water demand
 - * Water allocation for each distribution block

- (8) Alternative study
 - * Intake facilities
 - * Transmission facilities
 - * Treatment facilities
 - * Distribution facilities

- (9) Formulation of rehabilitation and expansion plan

- (10) Operation & maintenance plan

- (11) Preliminary cost estimate

- (12) Implementation schedule

- (13) Water tariff and financial plan

52

Ray

P

(14) Environmental aspects

(15) Project evaluation

(16) Identification of high priority project

Phase I-2 : Immediate Remedial Measures

(1) Formulation of the rehabilitation plan

(2) Formulation of operation & maintenance plan

(3) Preliminary design and cost estimate

(4) Evaluation of the plans

Phase II : Feasibility Study of High Priority Project

(1) Planning conditions

(2) Preliminary design

(3) Construction schedule and procurement of equipments and materials

(4) Organization and operation & maintenance plan

* Water charge collection system

* Leakage prevention strategy

* Repair shop

* Overall training programme

(5) Cost estimate

* Construction

* Operation & maintenance

(6) Project evaluation

3/6

Ray

J

(7) Implementation plan

5. STUDY SCHEDULE

The Study shall be conducted in accordance with the attached tentative schedule.

6. REPORTS

JICA will prepare and submit the following reports in English to the Government of P.N.G.

1) Inception Report

Twenty(20) copies at the commencement of the Study.

2) Progress Report

Twenty(20) copies within five(5) months after commencement of the Study.

3) Interim Report

Twenty(20) copies within nine(9) months after commencement of the Study.

4) Draft Final Report

Twenty(20) copies within fifteen(15) months after commencement of the Study.

The Government of P.N.G. shall provide JICA with its comments within one(1) month after the receipt of the Draft Final Report.

5) Final Report

Thirty(30) copies within one(1) month after the receipt of the said comments on the Draft Final Report from the Government of P.N.G.

ht

Py J

7. UNDERTAKING OF THE GOVERNMENT OF P.N.G.

1) To facilitate smooth conduct of the Study, the Government of P.N.G. shall take necessary measures :

- (1) To secure the safety of the Team,
- (2) To permit the members of the Team to enter, leave and sojourn in P.N.G. for the duration of their assignment therein, and exempt them from alien registration requirements and consular fees,
- (3) To exempt the members of the Team from taxes, duties and any other charges on equipment, machinery and other materials brought by the Team into and out P.N.G. for the implementation of the Study,
- (4) To exempt the members of the Team from income taxes and other charges of any kinds imposed on or in connection with any emoluments or allowance paid to the members of the Team for their services in connection with the implementation of the Study,
- (5) To provide necessary facilities to the Team for remittance as well as utilization of the funds introduced into P.N.G. from Japan in connection with the implementation of the Study,
- (6) To secure permission for entry into private properties or restricted areas for the conduct of the Study,
- (7) To secure permission for the Team to take all data and documents (including photographs) to Japan, for analysis during the implementation of the Study,
- (8) To provide medical services as needed. Its expenses will be chargeable on the members of the Team.

2) The Government of P.N.G. shall bear claims, if any, arises against members of the Team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful

3/2

P. N. G.

J

misconduct on the part of the members of the Team.

- 3) NCDC shall act as counterpart agency to the Team and OIDA shall play as coordinating body at the national level in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.
- 4) NCDC shall, at its own expense, provide the Team with the followings, in cooperation with other organizations concerned;
 - (1) Available data and information related to the Study,
 - (2) Full-time counterpart personnel,
 - (3) Suitable offices with necessary equipments in Port Moresby,
 - (4) Credentials or identification cards,
 - (5) Appropriate number of vehicles with drivers.

8. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures;

- 1) To dispatch, at its own expense, the Team to P.N.G.
- 2) To pursue technology transfer to the P.N.G. counterpart personnel, in the course of the Study.

9. CONSULTATION

JICA, OIDA and NCDC shall consult with each other in respect of any matter that may arise from or in connection with the Study.

42

AS

0

TENTATIVE SCHEDULE

MONTHS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WORK IN P.N.G.	←			p	h a s e	I			→	←		p	h a s e	h a s e	h a s e		→
WORK IN JAPAN																	
REPORTS PRESENTATION	△ IC/R				△ P/R				△ IT/R						△ DF/R		△ F/R

56
 Rey J

MINUTES OF MEETING
FOR
THE STUDY
ON
THE PORT MORESBY WATER SUPPLY DEVELOPMENT PLAN
IN
PAPUA NEW GUINEA
AGREED UPON BETWEEN
THE GOVERNMENT OF
THE INDEPENDENT STATE OF PAPUA NEW GUINEA
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

PORT MORESBY, PAPUA NEW GUINEA
APRIL 14, 1992

佐藤米司

Prof. Yoneji Sato
Leader,
Preparatory Study Team
JAPAN INTERNATIONAL
COOPERATION AGENCY



Mr. Gabriel Pepson
Director,
Office of International
Development Assistance
DEPARTMENT OF FINANCE
AND PLANNING



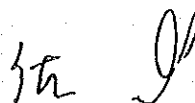
Mr. Frank John Igo
Chairman,
NATIONAL CAPITAL
DISTRICT COMMISSION

The Japanese Preparatory Study Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Professor Yoneji Sato, Hachinohe Institute of Technology, visited Papua New Guinea (hereinafter referred to as "P.N.G.") from April 6 to 15, 1992, in connection with the Study on the Port Moresby Water Supply Development Plan (hereinafter referred to as "the Study") in response to the request of the Government of P.N.G. dated on November 18, 1991.

The Team had a series of discussions with NCDC and authorities concerned of the Government of P.N.G. and carried out field surveys of the National Capital District and its surrounding areas.

The final meeting was held on April 14, 1992 with the attendants as per attached Lists. And as a result of the discussions, both sides agreed on the Scope of Work for the Study. The main items of mutual understanding in addition to the agreed Scope of Work are as follows:

1. Both sides confirmed to use "The Study on the Port Moresby Water Supply Development Plan" as the title of the Study.
2. The Study shall be conducted in accordance with the Scope of Work duly signed on April 14, 1992.
3. The Government of P.N.G. shall organize a "Steering Committee" comprised of representatives from NCDC and all authorities concerned of the Government of P.N.G. for the Study.
4. The Government of P.N.G. shall organize a "Counterpart Team" to the Japanese Full Scale Study Team.
5. The Government of P.N.G. requested to commence the Full Scale Study as soon as possible, and the Team promised to convey the



request to the Government of Japan.

6. The Government of P.N.G. requested to conduct the technical transfer to the Counterpart personnel during the Study in P.N.G., and the Team promised to convey the request to the Government of Japan.
7. The Government of P.N.G. requested to invite NCDC personnel to Japan as Counterpart Trainees during the Study in Japan, and the Team promised to convey the request to the Government of Japan.
8. The Team requested NCDC to organize security arrangement in particular, for the field survey conducted by the Full Scale Study Team, and the Government of P.N.G. agreed and promised to pay special attentions to this matter.
9. The Government of P.N.G. agreed to provide a fully furnished air-conditioned office with telephone, facsimile-machine, typewriter and copy machine, and two vehicles (1,600 c.c.type) with drivers for the Full Scale Study Team during the Study in P.N.G.
10. The Government of P.N.G. requested to provide personal computer for the Full Scale Study Team, and the Team promised to convey the request to the Government of Japan.

LIST OF ATTENDANCE

JAPANESE PREPARATORY STUDY TEAM

Professor Yoneji Sato	Hachinohe Institute of Technology
Mr. Yoshihisa Shimizu	Mechanical Section, Facilities Department, Osaka Municipal, Water Works Bureau, Engineering Division
Mr. Hiroshi Uchiyama	Second Development Study Division, Social Development Study Department, Japan International Cooperation Agency
Mr. Shigeharu Azegami	Consultant for Japan International Cooperation Agency
Mr. Yoichi Harada	Consultant for Japan International Cooperation Agency

EMBASSY OF JAPAN

Mr. Makoto Wakasugi	Counsellor
Mr. Takaaki Oiwa	Second Secretary

JICA P.N.G. OFFICE

Mr. Toru Kasai	Resident Representative
----------------	-------------------------



LIST OF ATTENDANCE

THE GOVERNMENT OF P.N.G.

OFFICE OF INTERNATIONAL DEVELOPMENT ASSISTANCE

Mr. Gabriel Pepson	Director, OIDA
Mr. Francis Wagaia	Acting Assistant Director, OIDA
Mr. Gerald Mwayubu	Principle Programmes Officer, OIDA
Mr. Kiyoka Masanobu	Adviser, OIDA

NATIONAL CAPITAL DISTRICT COMMISSION

Mr. Frank John Igo	Chairman, NCDC
Mr. Jack Pidik	Deputy Chairman, NCDC
Mr. Tavri J.H. Gureki	Commissioner, NCDC
Mr. Philip George	General Manager, NCDC
Mr. K. Arasaratnam	Deputy General Manager (Finance & Administration), NCDC
Mr. Allan Nema	Water & Sewerage Engineer, NCDC
Mr. John Kassman	Manager, Works, NCDC
Mr. Gabriel Kapris	Plant Engineer, NCDC
Mr. Yayonga D. Bal	Acting Principal Legal Officer, NCDC



Mr. Gerard Poigeno

Manager(Corporate Planning Unit),
NCDC

Mr. B.M. Karunaratne

Senior Construction Engineer, NCDC

Mr. Billy Imar

Water Supply and Sewerage Manager
NCDC

Mr. Sevese Eafeare

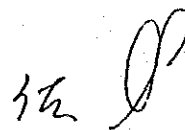
Design Engineer, NCDC

Mr. Barney Orere

Public Relations Manager, NCDC

Mr. Ovia Toua

Manager, Motu Koitabu Affairs
NCDC



4. 面談者リスト

(1) OFFICE OF INTERNATIONAL DEVELOPMENT ASSISTANCE(OIDA)

Mr. Gabriel Pepson	Director
Mr. Francis Wagaiya	Acting Assistance Director
Mr. Gerald Mwayubu	Principle Programme Officer
Mr. Kiyoka Masanobu	Adviser

(2) NATIONAL CAPITAL DISTRICT COMMISSION(NCDC)

Mr. Frank John Igo	Chairman
Mr. Jack Pidik	Deputy Chairman
Mr. Tavri J. H. Gureki	Commissioner
Mr. Philip George	General Manager
Mr. K. Arasaratnam	Deputy General Manager (Finance & Administration)
Mr. Allan Nema	Water & Sewerage Engineer
Mr. John Kassman	Manager Works
Mr. Gabriel Kapris	Plant Engineer
Mr. Yayonga D. Bal	Acting Principal Legal Officer
Mr. Gerard Poigeno	Manager(Corporate Planning Unit)
Mr. B. M. Karunaratne	Senior Construction Engineer
Mr. Billy Imar	Water Supply and Sewerage Manager
Mr. Sevese Eafeare	Design Engineer
Mr. Barney Orere	Public Relations Manager
Mr. Ovia Toua	Manager, Motu Koitabu Affairs
Mr. William Fabila	Plant Manager

(3) WATERBORAD

Mr. Ron Corden	Commercial Manager
----------------	--------------------

(4) DEPARTMENT OF WORKS

Mr. Lohia Hitolo

Secretary

(5) 在パプア・ニューギニア日本国大使館

増井 正

特命全権大使

若杉 慎

参事官

高橋 富雄

一等書記官

大岩 隆明

二等書記官

藤原 豊

二等書記官

(6) JICAパプア・ニューギニア事務所

河西 達

所 長

大野 政義

所 員

5. 資料収集リスト

〈国家開発計画等〉

- 1) An Integrated National Population Policy For Progress and Development,
1991
- 2) Development Policies and Strategies Vol. 1, 1992
- 3) Economic Policies Vol. 2, 1992
- 4) Estimates of Revenue and Expenditure Part 1 Vol. 3, 1992
- 5) Estimates of Revenue and Expenditure Part 2 Vol. 3, 1992
- 6) Public Investment Programmes 1992--1996 Vol. 4

〈NCDC関連〉

- 7) National Capital District Interim Commission Organisation Chart,
May 1989
- 8) National Capital District Commission Act 1990

〈NCD関連〉

・都市計画関係

- 9) Waigani Shopping Center Design Development October 1982/Department of
Urban Development
- 10) The Port Moresby Downtown Local Plan 1984/Development Planning and
Reserch Unit, Town Planning Division, NCDC
- 11) Port Moresby Interim Plan 1986/Development Planning and Reserch Unit,
Physical Planning Division, NCDC
- 12) Seminar Papers on Haus Sidel Foundation Seminar 1990
- 13) Independet State of Papua New Guinea/ Terms of Reference/ Urban services
Study of Port Moresby, National Capital District

・人口統計関係

- 14) National Capital District Population Information
- 15) National Capital District/Population by Single Year Age by Citizenship
and Sex

《水道関連》

・水源調査等

- 16) Report on Laloki River Basin Hydrology, January 1981/Bureau of Water Resources, Department of Minerals and Energy, Konedobu, Papua New Guinea
- 17) Port Moresby Water Supply Headworks study 1971
- 18) Operational Hydrology Study for the Laloki River System Final Report June 1989/Department of Environment and Conservation, Bureau of Water Resources

・水道計画等

- 19) Medium Term Development Strategy/Water Supply and sanitation Provision Policy Objectives and Service Provision in Urban Areas Working Paper No.6 June 1984/Development Planning and Reserch Unit, Town Planning Division, Department of Physical Planning and Environment, NCDC
- 20) Report on Upgrading Raw Water Supply and Treatment Plant, May 1987
- 21) Port Moresby Water Supply Study Final Draft Vol.2-Technical Details
- 22) Report on Upgrading Raw Water Supply and Treatment Plant-Goldie River Groundwater, May 1987

・その他

- 23) Papua New Guinea Manufacturers' Directory, 2/17/1992

《地図及び図面類》

- 24) 地形図 1/100,000. (KOKODA, EFOGI, KWIKILA, PORT MORESBY, GAIRE) 5葉
- 25) " 1/ 50,000. (SOGERI, PORT MORESBY) 2葉
- 26) PAPUA NEW GUINEA GENERAL REFERANCE MAP, 1/2,500,000 1葉
- 27) ポートモレスビ土地利用図, 1/12,500 2葉
- 28) PORT MORESBY CITY SUBURBAN MAPS, 1/12,000
- 29) 地質図(PORT MORESBY KALO-KALO)
- 30) PORT MORESBY CITY AND SUBURBS, 1/10,000 2葉
- 31) NCDC行政区域図, 1/12,500 2葉

- 32) 河川流量測定記録抜粋コピー
- 33) 既存配水管網図面集 (青焼き)
- 34) Mt. Eriama 浄水場平面図 (青焼き)

6. 調査日程

日順	月日	曜日	行程	行 動
1	4/5	日	成田→ケツズ	
2	/6	月	ケツズ→ポートモレスビー	
3	/7	火	ポートモレスビー	JICAパプア・ニューギニア事務所表敬、打合わせ 在パプア・ニューギニア日本国大使館表敬、打合わせ OIDA表敬、打合わせ NCDC表敬、打合わせ
4	/8	水	”	NCDC打合わせ
5	/9	木	ポートモレスビー及び 周辺地域	現地踏査（既存取水施設及び水源）
6	/10	金	ポートモレスビー	NCDC、S/W協議及び打合わせ
7	/11	土	ポートモレスビー及び 周辺地域	現地踏査（既存配水施設）
8	/12	日	ポートモレスビー	資料整理
9	/13	月	”	NCDC、S/W協議及び打合わせ
10	/14	火	”	OIDA、S/W及びM/W署名 JICAパプア・ニューギニア事務所報告
11	/15	水	”	団長、清水、内山団員ポートモレスビー発 畔上、原田団員NCDC打合わせ
12	/16	木	”	NCDC打合わせ
13	/17	金	”	資料整理
14	/18	土	ポートモレスビー→ケツズ	畔上、原田団員ポートモレスビー発
15	/19	日	ケツズ→成田	畔上、原田団員日本着

JICA