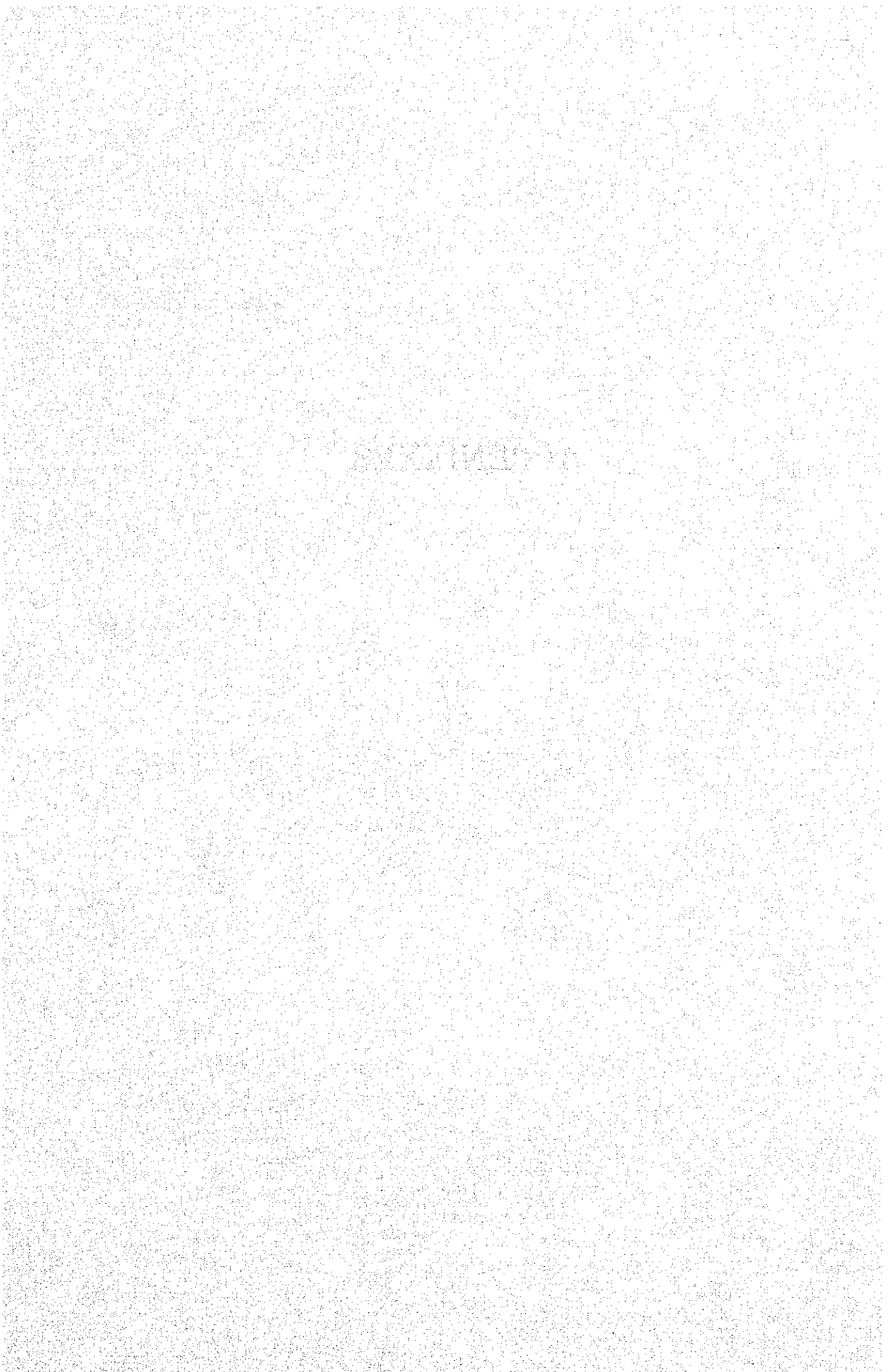
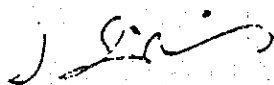


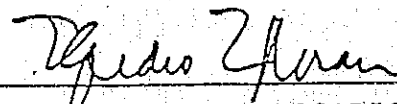
APPENDIXES



MINUTES OF MEETINGS
ON
THE FEASIBILITY STUDY
ON
THE ALCOGAS PROJECT
IN
DASMARIÑAS, CAVITE
IN
THE REPUBLIC OF THE PHILIPPINES
DECEMBER 16, 1980 Manila



SHOJIRO IMANISHI
Leader of the Preliminary Survey
Team for the Alcogas Project



ELPIDIO L. ROSARIO
Leader of the Philippine
Team for the Alcogas Project

MINUTES OF THE MEETINGS
(December 9-16, 1980)

The preliminary survey team sent by the Japan International Cooperation Agency (JICA) and the Philippine counterparts have discussed the study of the Alcogas Project in the Republic of the Philippines. Members lists of both sides are attached in Annex I. Both sides agreed on the Implementing Arrangement attached in Annex II and in that connection both sides had the following discussions:

1. Both sides agreed to have a study conducted on the Dasmariñas, Cavite area. Both sides also agreed to consider taking up another site for study at a later stage, while taking the results of the study on the above-mentioned site into consideration.
2. Both sides agreed that an objective analysis of the various feedstock alternatives (sugarcane, sweet potato and cassava) will be undertaken and the best feedstock will be considered on the basis of
 - 1) suitability to the area;
 - 2) cost of production;
 - 3) stability of supply; and
 - 4) processing considerations.

The Philippine side expressed the desire to give emphasis also to sweet potato/cassava in accordance with the policy of raw material diversification. The Japanese side, however, cited several problems which may make the planned study on the use of sweet potato/cassava as a raw material still premature. These are:

- a) Technology of large scale cultivation in the Philippines
- b) Weevil protection for sweet potato
- c) Breeding of a variety most suitable for the natural conditions in the Philippines
- d) Energy balance
- e) Additional investment on saccharification facilities
- f) Technology of fermentation of cassava

Nevertheless, a general study on sweet potato and cassava will still have to be undertaken before a final recommendation on the raw material is made and adopted as the subject of the more comprehensive study.

5. Both sides agreed that the study shall include all

aspects directly related to the functioning of the project from farm development, raw material production and processing up to the production of anhydrous alcohol.

4. The Japanese side offered to have distribution, storage and consumption of Alcohols covered under the study on the grounds that the study had best deal with the entire system from cultivation of raw materials to the consumption of produced alcohol.

Both sides understood, however, not to include distribution, storage and consumption of Alcohols in the study in view of the assurance given by the Philippine side to the effect that the Philippine side alone could deal with the matter.

LISTS OF
JAPAN INTERNATIONAL COOPERATION AGENCY
TEAM MEMBERS
AND
REPUBLIC OF THE PHILIPPINES
TEAM REPRESENTATIVES

15

Handwritten signature

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
REPRESENTATIVES

- 1) IMANISHI, SHOJIRO Director,
Development Cooperation Div.,
Economic Cooperation Bureau,
Ministry of Foreign Affairs ✓
- 2) NAKAZAWA, AKIRA Development Cooperation Div.,
Economic Cooperation Bureau,
Ministry of Foreign Affairs ✓
- (Agricultural Field)
- 1) HIURA, MICHIO Director,
Planning Department,
Agricultural Land Development
Corporation ✓
- 2) KUDO, MASAOKI Director,
Second Crop Division,
KYUSHU Agriculture Experiment
Station,
Ministry of Agriculture,
Forestry and Fisheries ✓
- 3) KAWAKITA, TOSHIHIKO Deputy Director,
Upland Crop Development Div.,
Agricultural Production Bureau,
Ministry of Agriculture,
Forestry and Fisheries
- 4) MIYAZAKI, TAKESHI Director, Irrigation & Drainage
Project Office of the Lower
CHIKUGO River Basin,
KYUSHU Regional Agricultural
Administration Office,
Ministry of Agriculture,
Forestry and Fisheries ✓
- 5) TAHARA, TAKAFUMI International Cooperation Div.,
Economic Affairs Bureau,
Ministry of Agriculture,
Forestry and Fisheries ✓

Tb

6) NISHIHATA, NORIO

Technical Affairs Division,
Agricultural, Forestry and
Fisheries, Planning and
Survey Department,
Japan International Cooperation
Agency

(Industrial Field)

1) NIIMURA, AKIRA

Director,
Business Division,
Alcohol Business Department,
Basic Industries Bureau,
MITI

2) YAMAJI, KAIZO

Deputy Director,
Technical Cooperation Division,
International Trade Policy
Bureau, MITI

3) URAO, HIDEO

Biomass Policy Office,
Basic Industries Bureau,
MITI

4) TAKIZAWA, HIROO

Alcohol Association of Japan

5) WADA, EIJIRO

Japan Automobile Manufacturers
Association (Inc.)

6) CHIBA, HIROO

Petroleum Association of Japan

7) ISHIDA, MASUMI

International Development Center
of Japan

8) YASUKI, HIDEO

Deputy Director,
Industrial Survey Division,
Japan International Cooperation
Agency

RP REPRESENTATIVES

- 1) ROSARIO, ELPIDIO L. PNAC, Deputy Director
Chief, Agricultural
Services
- 2) BALCE, NORBERTO V. PNAC
Chief, Industrial Services
- 3) LORILLA, FRANCIS M. PNAC
Chief, Planning and
Administration
- 4) JAYME, FORTUNATO Ministry of Agriculture
Energy Crops Consultant
- 5) CAMURUNGAN, RUBEN G. Philippine Sugar
Commission
Director, Special Operations
Office
- 6) SILVA, CONCHITA C. Ministry of Energy
Planning Service
- 7) REGUNAY, JOSE Ministry of Natural
Resources
Planning Service
- 8) SANTOS, ARSENIO Ministry of Finance
Bureau of Internal
Revenue
- 9) LEGASPI, CRISANTA S. Ministry of Finance
- 10) LAGOS, JULIETA S. PNAC
Planning & Administration

13) FORTUNO, ANDREW S. PNAC
Industrial Services

14) ANTONIO, EDWIN M. PNAC
Industrial Services

via

IMPLEMENTING ARRANGEMENT
OF
THE TECHNICAL COOPERATION
BETWEEN
THE JAPAN INTERNATIONAL COOPERATION AGENCY
AND
THE PHILIPPINE NATIONAL ALCOHOL COMMISSION
ON
THE FEASIBILITY STUDY
ON
THE ALCOGAS PROJECT
IN
DASMARINAS, CAVITE
IN
THE REPUBLIC OF THE PHILIPPINES

I. Background

In response to the request of the Republic of the Philippines, the Government of Japan dispatched a preliminary survey team headed by Mr. Shojiro Imanishi from 8th to 17th December 1980, through the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation of the Government of Japan, to carry out the preliminary survey for the feasibility study on the Alcogas Project in Dasmariñas, Cavite (hereinafter referred to as "the Study") and to discuss the implementing arrangement of the Study with the Philippine National Alcohol Commission (hereinafter referred to as "PNAC").

II. Objective of the Study

The basic objective of the Study is to examine the technical and economic feasibility of developing a farm for raw materials and establishing a municipal alcohol distillery with a capacity ranging from 50 to 60 kilo liters per day in Dasmariñas, Cavite.

III. Scope of Work

In order to achieve the above objective, the Study will cover the following items:

1. Data collection on the project site

(i) Natural Condition

- 1) Location
- 2) Topography
- 3) Meteorology
- 4) Hydrology
- 5) Soil and geology
- 6) Vegetation
- 7) Others

(2) Social and cultural environment

- 1) Number of houses and population densities
- 2) Accommodations, schools, hospitals, religious buildings, amusement places, and stores
- 3) Security measures
- 4) Sanitation

(3) Infrastructures

- 1) Transportation
- 2) Electricity
- 3) Communication
- 4) Possibility of utilizing river water for industries and irrigation
- 5) Others

(4) Present situation of the various industries

- 1) Mining
- 2) Industry
 - Sugar mills
 - General contractors
 - Other major industries
- 3) General service companies, such as bank insurance agencies, etc.

(5) Agriculture

- 1) Present land use and major agricultural products
- 2) Land ownership
- 3) Present cropping pattern and crop production
- 4) Farm economy
- 5) Agricultural inputs
- 6) Farm labor balance and mechanization
- 7) Agricultural infrastructures
 - Irrigation facilities
 - Drainage facilities

- Farm Roads

8) Agricultural cooperatives and other farmer's association

9) Others

6) Availability of industrial labors

1) Skilled laborers

2) Factory laborers

2. Selection of Raw Materials

(1) Adaptability

1) Current production

2) Future production

3) Possibility of the year round production

(2) Required inputs and facilities

(3) Constraints

1) Pest and disease

2) Weeds

3) Labour balance and mechanization

(4) Supporting services

1) Research and breeding activities

2) Agricultural extension

(5) Energy balance

(6) Production cost of raw materials and alcohol

(7) Others

3. Raw Material Production

(1) Concept design of farms

1) Water resources development

2) Irrigation and drainage facilities

3) Land consolidation

4) Soil improvement

5) Others

(2) Cultivation Program

- 1) Rotation system
- 2) Cropping pattern
- 3) Variety selection
- 4) Fertilizer application program
 - Chemical fertilizer
 - Utilization of by-products
- 5) Weed Control
- 6) Pest and disease control
- 7) Mechanization program
- 8) Others

(3) Operation and Management

- 1) Farm organization and community development
- 2) Water Management
 - Organization
 - Management system
- 3) Soil Management
 - Sub-soiling
 - Erosion control
 - Soil improvement materials
 - Chemical products
 - By-products.
- 4) Maintenance of Machinery
- 5) Labour Planning
- 6) Supporting Services
- 7) Others

(4) Agro-economy

- 1) Marketing of agricultural inputs and products
- 2) Household economy
- 3) Agro-industry
- 4) Agricultural cooperatives
- 5) Agricultural credit

4. Alcohol Production

- (1) Raw material procurement
- (2) Technologies of alcohol production
 - 1) Selection of extractive process of raw materials
 - 2) Selection of feedstock pre-treatment process
 - 3) Selection of fermentation process such as:
 - Batch process
 - Yeast recycle process
 - Continuous process
 - 4) Study on temperature range in fermentation
 - 5) Selection of distillation process (including dehydration process) in terms of:
 - Product quality
 - Alcohol content
 - Energy efficiency
 - 6) Selection of instrumentation system
 - 7) Study on developing markets for by-products
 - Bagasse
 - Separation and utilization of yeast
 - Recovered CO₂
 - 8) Examination for raising the operation ratio of plant
 - 9) Prospects of securing various fuels and determination of optimum fuel
 - 10) Examination of energy balance
- (3) Countermeasures for Environment
 - 1) Countermeasures for waste water
 - 2) Countermeasures for air pollution
 - 3) Countermeasures for noise, vibration and malodor
 - 4) Countermeasures for waste disposals
- (4) Outline of Alcohol Production Plant
 - 1) An overall scheme of alcohol production plant and determination of its capacity
 - 2) Outline of production facilities
 - 3) Features of other additional facilities (utilities,

safety measures, storage, loading facilities, plant offices, laboratories and others)

- 4) Operation ratio of plant
- 5) Features of transportation means for products and by-products
- 6) Features of facilities to treat waste water and industrial wastes

(5) Plant Management

- 1) Schedules of personnel required
- 2) Technical training schedules
- 3) Preventive measures against industrial accidents
- 4) Plant management
- 5) Maintenance controls

(6) Process Flow Sheet for the Alcohol Plant

(7) Concept Design of the Alcohol Factory

5. Economic and Financial Analysis

(1) Estimate of Investment Required for:

- 1) Development of farm land and infrastructure for transportation of the raw materials to the distillery

- 2) Construction of an alcohol distillery which includes:

- Production facilities (material receiving, fermentation, distillation, utilities, storage tanks and waste water treatment facilities)

- Other facilities related to plant safety, security and overall plant administration

- (2) Estimate of Operating Capital
 - (3) Cost Estimate for:
 - 1) Raw material
 - 2) Anhydrous alcohol
 - 3) Transportation
 - 4) Other by-products
 - (4) Estimate of Benefits
 - (5) Two Sets of Economic and Financial Projections over an Appropriate Period with and without Board of Investment Incentives including:
 - 1) Income statement
 - 2) Cash flow
 - 3) Balance sheet
 - 4) Rate of return analysis
 - 5) Break-even analysis
6. Implementation Schedule
 7. Recommendation

IV. Study Schedule

- (1) The Government of Japan will dispatch a study team (hereinafter referred to as "the Team") through JICA within three (3) months after the preliminary survey.

- (2) The Team will prepare and submit the following reports, including all related maps and plans, in English, within the time period indicated, to the Government of the Philippines:
 - 1) Progress Report or Interim Report, at the end of the study for the selection of a raw material (Phase I) which will take four (4) months (20 copies).
 - 2) Draft Final Report, at the end of the in-depth study on the selected raw material (Phase II) which will take three and a half (3.5) months (20 copies).
 - 3) Final Report, within two (2) months on the receipt of comments on the Draft Final Report (50 copies).
- (3) Consultations between the Philippine and Japanese sides will be undertaken at the end of each Phase of the study.
- (4) The Government of Japan will dispatch Advisory Groups during the Study for the purpose of supervision.

V. Roles of the Government of Japan:

1. The Government of Japan will dispatch the TEAM through JICA, and provide expertise.
2. The Government of Japan will extend the technical cooperation to transfer the technology related to this project for the Philippine counterparts through their participation in the study.
3. The Government of Japan will, in addition to the technical cooperation mentioned above, receive the Philippine

counterparts through the normal procedures under the Colombo Plan Technical Cooperation Scheme. The expense will be borne by the Japanese side.

VI. Roles of the Government of the Philippines

1. The Government of the Philippines through PNAC will designate a sufficient number of full-time counterparts, at least in the fields corresponding to the TEAM experts at the starting date of the Study.
2. The Government of the Philippines will arrange the TEAM's visits to relevant ministries, local governments and other public agencies and ensure that the Japanese TEAM have access to all relevant informations required for the completion of the Study.
3. The Government of the Philippines will contribute to cover the costs incurred on the following items:
 - (1) Suitable office with necessary office supplies and equipment
 - (2) Exemption from taxes, duties, and charges to be imposed on the equipment imported to the Philippines for the survey, the personal effects and incomes of the JICA experts, provided that such incomes are not derived from local sources.
 - (3) Local non-technical staff including secretaries, typists, draftsmen, and other personnel directly

related to the requirement of the Study.

(4) Part-time helpers (excluding students) for the field survey.

(5) Operation cost (drivers, fuel and other) of two to four cars.


4. The Government of the Philippines will provide all relevant study reports and available data as well as maps of scale 1/5,000 and aerial photographs to the TEAM. In case such maps are not available, necessary arrangements will be made in time to meet the above Study Schedule (IV).

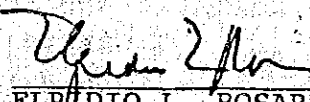
5. The Government of the Philippines will permit the TEAM to conduct the field surveys upon request by the TEAM. The Government will also do the best efforts to ensure the security of the members of the TEAM during their stay in the Philippines.

Elia

MINUTES OF MEETINGS
FOR
THE AMENDMENT
OF
THE IMPLEMENTING ARRANGEMENT
ON
THE FEASIBILITY STUDY
ON
THE ALCOGAS PROJECT
IN
THE REPUBLIC OF THE PHILIPPINES
BETWEEN
THE JAPAN INTERNATIONAL COOPERATION AGENCY
AND
THE PHILIPPINE NATIONAL ALCOHOL COMMISSION

JUNE 4, 1981, MANILA


TOSHIKAZU MIURA
Resident Representative
in the Philippines
Japan International Cooperation
Agency


ELPIDIO L. ROSARIO
Leader of the Philippine
Team for the AlcoGas Project

MINUTES OF MEETINGS

(June 4, 1981)

I. INTRODUCTION

1. The preliminary survey team headed by Mr. SHOJIRO IMANISHI which was assigned by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and the Philippine counterparts, headed by Dr. Elpidio L. Rosario (hereinafter referred to as "the Philippine Team") agreed to have the Feasibility Study on the Alcogas Project in the Republic of the Philippines (hereinafter referred to as "the F/S"), conducted in the Dasmariñas, Cavite area, on the basis of the Minutes of Meetings of December 16, 1980, including IMPLEMENTING ARRANGEMENT (hereinafter referred to as "the existing I/A").
2.
 - (1) In response to "the existing I/A", the Japanese Government dispatched the feasibility study team, headed by Mr. MICHIO HIURA, through JICA from March 19, 1981, to carry out the Phase I study.
 - (2) In the course of the discussions of the contents of the F/S, the Philippine Team proposed to alter the Project Site from Dasmariñas to Maragondon by the letter dated March 24, 1981.
 - (3) After consultation with the Japanese Government on this proposal, the preliminary survey was carried out to examine the suitability of Maragondon, Cavite area for the F/S instead of the originally scheduled study in the Dasmariñas, Cavite during the period from March 30 to April 7, 1981.

- (4) Based on the result of the preliminary survey, the study in Japan was carried out from April 8 to April 18, 1981.
- (5) Taking into consideration the result of the preliminary survey in the Philippines and the study in Japan, the Japanese Government decided to implement the F/S in Maragondon, Cavite through JICA on May 20, 1981.

II. ALTERATION OF THE EXISTING I/A

According to the above-mentioned I (INTRODUCTION), on June, 1981, JICA and the Philippine Team agreed on the amendment of the existing I/A, as follows:

1. The Project Site

The Study Site stipulated in the existing I/A shall be altered from "Dasmarinas, Cavite" to "Maragondon, Cavite".

2. The Study Schedule

- (1) "Four (4) months" stipulated in the Item (2)-1 of the Article IV in the existing I/A shall be altered to "four and a half (4.5) months".
- (2) "Three and a half (3.5) months" stipulated in the Item (2)-2 of the Article IV in the existing I/A shall be altered to "four and half (4.5) months".
- (3) All the other articles and items of the existing I/A except those above-mentioned shall remain unchanged.

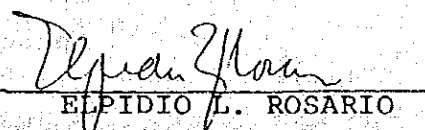
IN WITNESS WHEREOF, both sides have caused this Amendment of the existing I/A to be signed as of June 4, 1981.

MINUTES OF MEETINGS
FOR
DRAFT FINAL REPORT OF FEASIBILITY STUDY
ON
ALCOGAS PROJECT
IN
THE REPUBLIC OF THE PHILIPPINES

MARCH 26, 1982, MANILA


SHIZUO KISHIDA

Leader of the Japanese
Study Team Sent by
Japan International
Cooperation Agency


ELPIDIO L. ROSARIO

Leader of the Philippine
Team for the Alcogas
Project

MINUTES OF MEETINGS

(March 22-25, 1982)

The Japanese Study Team (hereinafter referred to as "The Japanese Team") for the feasibility study (hereinafter referred to as "the F/S") on the ALCOGAS PROJECT commissioned and dispatched by Japan International Cooperation Agency (hereinafter referred to as "JICA"), the authentic agency responsible for implementation of the technical cooperation programs of the Government of Japan, presented to the Philippine National Alcohol Commission (hereinafter referred to as "PNAC") and the authorities concerned, the DRAFT FINAL REPORT (hereinafter referred to as "The Report") on the results of the Phase-II of the F/S, the detailed study on technical, economic feasibility study of alcohol production assuming the use of sugarcane as the raw material from agricultural and industrial standpoint.

The following is the summary of discussion and agreement between the two parties during the meetings:

1. Meeting schedule and members' lists of both parties are attached in Annex I and Annex II, respectively.

2. Presentation of The Report

2.1 The Japanese Team presented The Report which has been prepared based on the MINUTES OF THE MEETINGS dated December 16, 1980 and June 4, 1981.

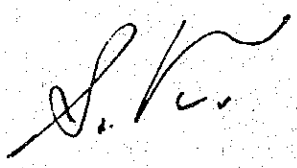
The abstract of the presentation is attached in Annex III.

2.2 PNAC and the Japanese Team exchanged views

on The Report and PNAC accepted the basic contents of The Report after the following discussions:

- a. It was brought forward by PNAC that the monoculture system of sugarcane cultivation as practiced in the Philippines might also be considered for better implementation of the Project. The Japanese Team, while reassuring that the cropping pattern proposed in The Report is considered more practical and feasible in the Project Area, judging from the results of field surveys consolidated and supported by the farmers in the Area, stated that the Japanese Team will additionally deliberate a case study of financial analysis in the Final Report where monoculture system of cropping pattern is reflected with the corresponding distillery capacity of 60 kl/day.
- b. PNAC pointed out that opportunity price of sugarcane processed to produce sugar for export should also be considered for economic analysis in order to find whether sugarcane should be used for the production of alcohol or for that of sugar in view of national economy.

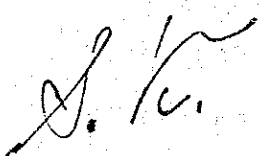
In reply to this, the Japanese Team commented that such study will inevitably require detailed study on sugar mill and other related items as carried out on alcohol distillery in this project study, and that such study on sugar mill is out



of Scope of Work confirmed in the
Implementation Arrangement.

2.3 It was confirmed by both parties that The Report is considered as final after inclusion of additional financial analysis and subsequent results of agricultural practices mentioned above. The Final Report (50 copies) will be submitted to the Government of the Philippines by the end of May, 1982.

Both parties accepted the above.

A handwritten signature in dark ink, appearing to be 'S. K.', located in the lower-left quadrant of the page.A handwritten signature in dark ink, appearing to be 'J. K.', located in the lower-right quadrant of the page.

ANNEX - I

Meeting Schedule

	A.M.	P.M.
March 22 (Mon)	Presentation by Team Leader Reporting Volume I	Reporting Volume I
March 23 (Tue)	Reporting Volume II	Reporting Volume II
March 24 (Wed)	Visit to Project Site	Visit to Project Site
March 25 (Thu)	Questions and Answers	Questions and Answers
March 26 (Fri)	Preparation of Minutes	Signing Minutes

S.K.

TLH

ANNEX - II

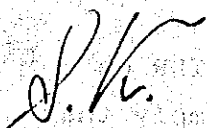
Member List

1. The Japanese Team

- Leader of Japanese Team and
Leader of Industrial Sector Team Mr. Shizuo Kishida
- Leader of Agricultural Sector Team Mr. Michio Hiura
- Member of Agricultural Sector Team Mr. Yukio Sasaki
 - ditto - Mr. Masasaburo Shimamura
 - ditto - Mr. Makoto Ishizuka
- Member of Industrial Sector Team Mr. Kiichiro Tanabe
 - ditto - Mr. Satoru Nishiyama
 - ditto - Mr. Akinori Hashimoto
 - ditto - Mr. Kimio Gyoda

2. Philippine Counterparts

- Deputy Executive Director, PNAC Dr. Elpidio L. Rosario
- Chief, Industrial Services, PNAC Mr. Norberto V. Balce
- Chief, Planning & Administration, PNAC Mr. Francis M. Lorilla
- Staff, Planning & Administration, PNAC Miss Julieta S. Lagos
- Staff, Industrial Services, PNAC Mr. Andrew S. Fortuno
- Staff, Agricultural Services, PNAC Mr. Rodelio B. Carating
- Staff, Energy Crops Team, Ministry
of Agriculture Mr. Perfecto P. Evangelist



ANNEX - III

Abstract

1. Outline of Project

(1) General

1) Total Capital Investment
Approximately 186 (10⁶ pesos) in addition to above, governmental investment of about 24 (10⁶ pesos) would be required.

2) Schedule

Start-up of Distillery is assumed January 1987.
(Construction period of 4 years will be required)

(2) Agricultural

1) Farm Area

Estate area	400 ha
Individual farmers' land area	2,640 ha

2) Expected Sugarcane Yield

123,670 t/y as total sugarcane yield from both estate and individual farmers' land

(3) Industrial

Distillery

Plant Capacity	48 kl/d
Annual operating days	200 d/y

2. Project Evaluation

(1) Economic Analysis

Results of economic analysis give EIRR value of 9.7 % which implies that the project can create certain economic benefit to the country and therefore that it should be promoted for realization.

(2) Financial Analysis

Financial analysis gives FIRR on Investment and FIRR on Equity of 9.2 % and 16.8 %, respectively, which imply that the project can have fair profitability if not very high.