

**MINUTES OF UNDERSTANDING
ON THE
JAPANESE TECHNICAL COOPERATION
FOR
ENVIRONMENTAL AND PRODUCTIVITY MANAGEMENT
OF MARGINAL SOILS
IN
THE REPUBLIC OF THE PHILIPPINES**

As described in the document attached to the Minutes of Discussions of the Preliminary Study Team on the Project on Environmental and Productivity Management of Marginal Soils in the Philippines (hereinafter referred to as "the Project") signed in Metro Manila on August 25th, 1999, the Government of Japan dispatched Japanese Specialists for the Supplementary Study (hereinafter referred to as "the Specialists") headed by Dr. Tamaki Yasuda, from November 23rd, 1999 to December 9th, 1999. The Specialists were dispatched through the Japan International Cooperation Agency (hereinafter referred to as "JICA") for the preparation of the Project - Type Technical Cooperation Program.

During their stay in the Republic of the Philippines, the Specialists carried out a field survey, exchanged views, and had a series of discussions with the authorities of the Bureau of Soils and Water Management of the Department of Agriculture (hereinafter referred to as "BSWM") so as to understand the background and to define the Project more clearly and concretely.

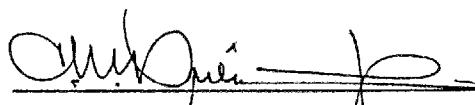
As a result of the discussions and the field surveys, the Specialists and the BSWM agreed to recommend to their respective governments the Tentative Framework of Technical Cooperation referred to in the document attached hereto.

Metro Manila, 8 December, 1999

For the Secretary:



DR TAMAKI YASUDA
Team Leader
The Supplementary Study Team
Japan International Cooperation Agency
Japan



MR CESAR M. DRILON, JR.
Undersecretary
Department of Agriculture
Republic of the Philippines

THE ATTACHED DOCUMENT

I Supplementary Study Team

A Objective

The Bureau of Soils and Water Management of the Department of Agriculture is responsible for the formulation and implementation of measures designed for more effective utilization of soils, land and water resources, as well as the soil preservation in crop lands and other agricultural lands. To achieve this objective, Grant Aid Program and Technical Cooperation Projects have been provided by Japan.


Taking this into consideration, in September 1998, the Republic of the Philippines made a request for the project entitled "Environmental and Productivity Management of Marginal Soils in the Philippines".

From August 18 to 26, 1999, JICA dispatched Preliminary Study Team for the purpose of clarifying the background of the request and problems, etc. Based on the suggestions and comments presented by the Preliminary Study Team, in November, JICA dispatched Specialists for the following purpose:

- (a) To confirm the project implementation system of the BSWM, and NOMIARC;
- (b) To confirm the implementation and cooperation systems of NOMIARC as the partner institution of the Project;
- (c) To confirm the cooperation systems of farmers' associations, NGO as the cooperating organizations of the Project;
- (d) To formulate the tentative project framework;
- (e) To define the function and role of the respective Project organizations, and to define the concrete cooperation system between the executing organization, NOMIARC, and farmers' associations;
- (f) To design the detailed activity plan that would be implemented at the respective Project sites;
- (g) To prepare a definite plan for the provision of equipment for the Project;
- (h) To formulate a draft of the Tentative Schedule of Implementation composed of an Annual Program and a Technical Cooperation Program; and
- (i) To make a draft Project Design Matrix (PDM).

The Specialists and the Philippine side reviewed the contents of the tentative PDM formulated in the preliminary study conducted from August 18 to 26, 1999, with the objective more effective and efficient implementation of the Project.

As a result of the field survey and discussions, this report has been prepared to summarize matters studied by the specialists and the Philippine side.



B Members

Dr. TAMAKI YASUDA (Leader Soil Conservation)
Technical Advisor, Chisso Asahi Fertilizer Co., Ltd.

Dr. MAKOTO YAMAGATA (Soil / Land Evaluation)
Chief, Crop Production Research Team,
Hokkaido National Agricultural Experiment Station,
Ministry of Agriculture, Forestry and Fisheries (M.A.F.F.)

Dr. TADASHI KATO (Soil Fertilization)
Chief in Laboratory of Soil Science and Plant Nutrition,
Research Institute of Vegetables, Ornamental Plants and Tea,
Ministry of Agriculture, Forestry and Fisheries (M.A.F.F.)

Dr. HIROMASA HAMADA (Water Resource Management)
Senior Researcher, Department of Regional Resources,
National Research Institute of Agricultural Engineering,
Ministry of Agriculture, Forestry and Fisheries (M.A.F.F.)

Ms. YUKIYO MAEDA* (Technical Cooperation)
Staff, Agricultural Technical Cooperation Division,
Agricultural Development Cooperation Department, JICA

*YUKIYO MAEDA joined the team from 2nd December

II Framework of Technical Cooperation for the Project

The Specialists and the Philippine side jointly formulated the following tentative framework of the Project based on the request made by the Philippine side, taking into account the findings of the Specialists and the results obtained by the previous study.

The framework that is shown as follows may be subject to change based on future discussions and studies.

A. NAME OF THE PROJECT

Environmental and Productivity Management of Marginal Soils in the Philippines

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B. PHILIPPINE ORGANIZATIONS INVOLVED IN THE PROJECT

(a) Responsible public administrative organization of the Project

Department of Agriculture (hereinafter referred to as "DA")

(b) Executing organization of the Project

Bureau of Soils and Water Management (BSWM), DA

(c) Partner organization of the Project

Northern Mindanao Integrated Agricultural Research Center (NOMIARC)
NOMIARC provide the necessary technical support for setting up the techno-
demo farm in Bukidnon.

C. PROJECT SITES

(a) Main site

BSWM, DA, located in Metro Manila

(b) Sub-sites in the pilot marginal lands

- 1) National Soil and Water Resources Research and Development Center in
San Ildefonso, Bulacan
- 2) National Soil and Water Resources Research and Development Center in
Tanay, Rizal
- 3) Highland Soil and Water Resources Conservation Research and
Demonstration Center in Malaybalay, Bukidnon

The above-mentioned sub-sites in the pilot marginal lands were selected by the Japanese and Philippine sides, taking into account the results gained by past technical cooperation programs, geographical variation of marginal lands, and cooperation impact as well as the potential economic impact in the marginal lands.

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(c) Techno-demo farms set up in the farmer's fields in the pilot marginal lands

Techno-demo farms will be set up in the farmer's fields in the following pilot marginal lands.

- 1) Upland marginal lands
Bulusukan, San Ildefonso, Bulacan
- 2) Hilly Land marginal lands
Sampaloc, Tanay, Rizal
- 3) Highland marginal lands
Intavas, Impasug-ong, Bukidnon

The farmer's field for setting up the techno-demo farm will be selected through the careful investigation to be carried out by the respective preparatory committees to be set up in the above-mentioned pilot marginal lands.

D. TERM OF COOPERATION

Five Years

E. MASTER PLAN

(a) Super goal

The soil and water conservation-based farming systems are developed for marginal lands.

(b) Overall goal

The soil and water management technologies contributing to the stable and sustainable agricultural production in the pilot marginal lands are adopted.

(c) Project Purpose

The soil and water management technologies suitable for the pilot marginal lands are established.

(d) Expected Output

1. The soil and water management technologies for techno-demo farms are developed.
2. Developed soil conservation and water management technologies are verified in the techno-demo farms.
3. A system for monitoring and evaluation of the Project is established.

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(e) Activities

I. Development of Soil and Water Management Technologies for Farmers' Participatory Techno-demo Farms

1-1 Development of Agricultural Resources Information System

1-1-1 Inventory and information of Agricultural Resources

1-1-2 Development of the Methods of Agricultural Resources Information Analysis

1-1-3 Application of the Acquired Agro-Environmental Information

1-2 Development of Water Resources Management Technologies

1-2-1 Development of the Methods for Identification and Fluctuation Simulation of Water Resources in the Pilot Watersheds

1-2-2 Development of the Technologies for Water Resources for the Marginal Land

1-2-3 Development of the Methods for Utilization of Water Resources for the Marginal Land

1-3 Assessment of Soil Conservation System on Soil Productivity and Environment

1-3-1 Assessment of Soil Conservation Technologies on Soil and Water Qualities

1-3-2 Assessment of Soil Conservation Technologies on Productivity

1-4 Improvement of Productivity of Marginal Soils with Environmental Conservation

1-4-1 Development of Effective Fertilization for Marginal Soils

1-4-2 Improvement of Fertility of the Marginal Soils

II. Establishment of Farmers Participated Techno-demo Farms to Disseminate Soil and Water Management Technologies

2-1 Planning of the Techno-demo Farms Located in the Marginal Upland, Hilly Land, and Highland

2-1-1 Action Plan of the Techno-demo Farms (Including Organizing Several Task Forces and Committees)

2-1-2 Characterization of Vegetation, Soils and Water Resources in the Pilot Watersheds

2-1-3 Indigenous Agriculture Technologies and Market Research

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2-2 Introduction of Appropriate Soil and Water Technologies to the Techno-demo Farms Located in the Marginal Upland, Hilly Land, and Highland

2-2-1 Introduction of Developed Soil and Water Management Technologies

2-2-2 Integration of Agriculture Technologies

2-2-3 Training for Farmer-Cooperators

2-2-4 Monitoring and Evaluation of the Techno-demo Farms

F. ORGANIZATIONAL SET-UP OF THE PROJECT

The BSWM, as the implementing organization of the project, is responsible for the research and development of packaged technologies suitable for the pilot marginal lands and their dissemination in cooperation with local government units (LGUs), non-government organizations (NGOs) and other extension services institutions. The Japanese cooperation will focus on technical assistance and advise on technologies for marginal soils.

The three research centers shall be the sites for typical marginal soil technology development. Strong relationship with NOMIARC shall be pursued in order to promote the development of integrated agricultural technologies useful for the farmers in highland marginal lands.

G. MEASURES TO BE TAKEN BY THE JAPANESE SIDE

(a) Dispatch of Japanese Experts

Japanese experts in the following fields shall be dispatched:

1) Long-Term Experts

Team Leader

Coordinator

Long-term experts in the fields of Soil Conservation, Soil and Land Evaluation, and Soil Fertility Management

2) Short-Term Experts

Short-term experts may be dispatched, when necessity arise, for the smooth implementation of the project

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- (b) Acceptance of Counterpart Personnel in Japan for Training
Acceptance of counterpart personnel to the Japanese experts for training in Japan shall be arranged during the cooperation period.

(c) Provision of Machinery and Equipment

Necessary machinery, equipment and other materials (hereinafter referred to as "the Equipment") for the implementation of the Project will be provided within budgetary limitations.

H. MEASURES TO BE TAKEN BY THE PHILIPPINE SIDE

(a) Provision of the Buildings and Facilities in the Site Necessary for the Implementation of the Project.

Land, buildings and facilities needed for the implementation of the Project
Rooms and space necessary for installation and storage of the equipment
Office space and necessary facilities for the Japanese Team Leader, Coordinator and other Japanese Experts
Other facilities mutually agreed upon, if necessary

(b) Assignment of the Necessary Number of Full-time/Part-time Counterpart Personnel to work with the Japanese long-term experts, and administrative and technical staff to support the activities of the Project.

(c) Sound Budgetary Allocation for the Smooth Commencement and Successful Implementation of the Project.

- 1) Expenses necessary for domestic transportation of the Equipment in the Republic of the Philippines, as well as for its installation, operation and maintenance.
- 2) Customs and duties, internal taxes and other charges imposed on the Equipment in the Republic of the Philippines
- 3) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment
- 4) Supply or replacement of materials necessary for the management of techno-demo farms.
- 5) All operating expenses necessary for the implementation of the Project

(d) Coordination and Harmonization with Related Institutions

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I. ADMINISTRATION OF THE PROJECT

The Secretary of the Department of Agriculture, as the Head of the Project, shall provide the overall direction for the administration and implementation of the Project.

The Director of the BSWM, as the Project Director, shall bear the overall responsibility for the administration and implementation of the Project with the support of the Assistant Director as Deputy Project Director.

A Senior Staff of the BSWM duly designated by the Project Director as the Project Manager, shall be responsible for the managerial and technical matters of the Project.

J. JOINT COORDINATING COMMITTEE

(a) Function

The Joint Coordinating Committee composed of those members as listed in (b) below will meet at least once a year and whenever the need arises to:

- 1) Formulate the Annual Work Plan under the framework of the Record of Discussions;
- 2) Review the overall progress of the technical cooperation program as well as achievement of the Annual Work Plan of the Project;
- 3) Review those measures taken by the Government of Japan:
 - a. Dispatch of Japanese experts
 - b. Acceptance of Philippine counterpart personnel in Japan for training
 - c. Provision of machinery and equipment,
- 4) Review those measures taken by the Government of the Republic of the Philippines:
 - a. Allocation of necessary budget (including local cost expenditures)
 - b. Allocation of necessary counterpart personnel
 - c. Utilization and administration of machinery and equipment provided by the Government of Japan,

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5) Make recommendations to the respective governments on:

- . Budgetary matters
- . Recruitment and appointment of the Philippine counterpart personnel
- . Selection and effective utilization of machinery and equipment
- . Appropriate dispatch of Japanese experts
- . Acceptance of Philippine counterpart personnel in Japan for training
- . Others

(b) Committee Composition

1) Chairperson: Secretary, DA

2) Members:

(i) Philippine side

- a. Undersecretary for Regional Operation, Research, Training and Extension, DA
- b. Assistant Secretary for Regional Operations, DA
- c. Director, BSWM, DA
- d. Assistant Director, BSWM, DA
- e. Project Manager, EPMMA
- f. Director of Agriculture Staff, National Economic Development Authority (NEDA)
- g. Director of Project Monitoring Staff, NEDA
- h. Director, Project Development Services, DA
- i. Director, Budget Bureau "B", Department of Budget and Management (DBM)
- j. Director, Project Development and Management Staff, Department of Agrarian Reform (DAR)
- k. Representative from the Department of Environment and Natural Resources (DENR)
- l. Director, Bureau of Agricultural Research (BAR)
- m. Administrator, National Irrigation and Administration (NIA)
- n. Representative, Department of Interior and Local Government (DILG)
- o. Representative, University of the Philippines at Los Baños
- p. Regional Director, Department of Agriculture-Regional Field Unit III
- q. Regional Director, Department of Agriculture-Regional Field Unit IV
- r. Regional Director, Department of Agriculture-Regional Field Unit X

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(ii) Japanese side

- a. Team Leader
- b. Coordinator
- c. Experts assigned to the Project
- d. Other Japanese experts and personnel concerned dispatched by JICA if necessary.
- e. Resident Representative of the JICA Philippine Office

Notes:

Officials of the Embassy of Japan may attend the Joint Coordinating Committee meeting as observers.

Persons who are nominated by the Chairperson may attend the Joint Coordinating Committee meeting.

K. Tentative Schedule of Implementation (TSI)

Japanese side and Philippine side had discussed TSI, and made a detailed tentative one as contained in ANNEX-1.

Also, detailed activities of the Project will be discussed by both sides at the beginning of the project term.

L. Tentative Project Design Matrix

Based on the discussions of Preliminary Study and Supplementary Study Teams, the Specialists and the concerned authorities of the Government of the Philippines prepared a tentative PDM as contained in ANNEX-2. The PDM was reviewed and both sides agreed on Indicators, Means of Verification, Assumptions, and so on at the beginning of the project term. Further review of the PDM will be depending on the progress of the Project.

M. Tentative List of Philippine Counterparts

The tentative list of Philippine counterparts are contained in ANNEX-3.

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III Comments and Suggestions

- (a) The BSWM should request the local governments to repair the access road of Sampaloc, Tanay and Bulusukan, San Ildefonso techno-demo farms (including the bridge).
- (b) To collect precise field data, the fence or net that takes away the rats or other animals from the crops should be set in the experiment fields.
- (c) When the relocation of C/P personnel occurs, it is critically important to pass down all the information to the successor so that activities go smoothly.
- (d) Though the budget of the buildings and facilities in Bukidnon is divided into 2000, and 2001 year, to arrange these buildings as early as possible is necessary for the activities of techno-demo farms in Bukidnon. Also, the permanent staffs and other staffs who will be counterparts and implementors of the Project in Bukidnon especially the techno-demo farm group must be assigned in Bukidnon early.
- (e) Because the techno-demo farms are designed and managed by Committee, the first preliminary operation plan of techno-demo farms should be made before the project, as preliminary study team recommended in the Minutes of Discussions.
- (f) Though the extension is not within the project, but to make the project more fruitful, the JICA hope that the BSWM and other organizations must have a good linkage for the extension.
- (g) To make PDM for the project, continue discussions on Indicators, Means of Verification, Assumptions, and so on (especially by next mission).

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ANNEX 1 Detailed Tentative Schedule of Implementation (dTSI)

ITEM	1 st	2 nd	3 rd	4 th	5 th
I. Development of Soil and Water Management Technologies for Farmers' Participatory Techno-demo Farms					
1-1 Development of Agricultural Resources Information Systems					
1-1-1 Inventory of Agricultural Resources and Information System					
1-1-1-1 Review of Information Systems					
1-1-1-2 Soil Resources Inventory					
1-1-1-3 Land Resources Inventory					
1-1-1-4 Water Resources Inventory					
1-1-2 Design and Development of the Agricultural Resources Information System					
1-1-2-1 Information System Framework					
1-1-2-2 Methods of Data Encoding-Decoding					
1-1-2-3 Methods of Information Analysis					
1-1-2-4 Information Linkage/Network					
1-1-2-5 Reliability and Scalability of the System					
1-1-3 Application of the Developed Agricultural Resources Information System					
1-1-3-1 Methods of Utilization of the Agricultural Resources Information System					
1-1-3-2 Simulation Model for the Environmental and Productivity Management for Pilot Watershed					
1-1-3-3 Evaluation of the Developed Agricultural Resources Information System					
1-2 Development of Water Resources Management Technologies					
1-2-1 Development of the Methods for Identification and Fluctuation Simulation of Water Resources in the Pilot Watersheds					
1-2-1-1 Methods for Identification of Existence and Fluctuation of Water Resources					
1-2-1-2 Existence and Fluctuation of Water Resources					
1-2-1-3 Methods for Fluctuation Simulation of Water Resources					

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Continuation

ITEM		1 st	2 nd	3 rd	4 th	5 th
1-2-2	Development of the Technologies for Water Resources for the Marginal Land					
1-2-2-1	Water Collection Technologies					
1-2-2-2	Water Storage Technologies					
1-2-2-3	Water Conservation Technologies					
1-2-3	Development of the Methods for Utilization of Water Resources for the Marginal Land					
1-2-3-1	Criteria for Water Distribution					
1-2-3-2	Water Distribution Technologies					
1-3	Assessment of Soil Conservation System on Soil Productivity and Environment					
1-3-1	Assessment of Soil Conservation Technologies on Soil and Water Qualities					
1-3-1-1	Assessment of Hedgerow with Trees and Shrubs on Soil and Water Qualities					
1-3-1-2	Assessment of Perennial Plants on Soil and Water Qualities					
1-3-1-3	Assessment of Permeability Improvement Strips on Soil and Water Qualities					
1-3-2	Assessment of Soil Conservation Technologies on Productivity					
1-3-2-1	Assessment of the Soil Conservation Technologies on Crop Yield					
1-3-2-2	Assessment of the Soil Conservation Technologies on Nutrient Uptake and Loss					
1-4	Improvement of Productivity of Marginal Soils with Environmental Conservation					
1-4-1	Development of Effective Fertilization for Marginal Soils					
1-4-1-1	Analysis of Constraints on Crop Production in Marginal Soils					
1-4-1-2	Nutrient Dynamics Including Immobilization and Mineralization					
1-4-1-3	Use and Optimization of Organic and Inorganic Materials in Marginal Soils and their Residual Effects					
1-4-2	Improvement of Fertility of the Marginal Soils					
1-4-2-1	Soil Fertility with Suitable Cropping Systems					
1-4-2-2	Utilization of Interaction Between Microorganisms and Plants in Marginal Soils					

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Continuation

ITEM	1 st	2 nd	3 rd	4 th	5 th
II. Establishment of Farmers Participated Techno-demo Farms to Disseminate Soil and Water Management Technologies					
2-1 Planning of the Techno-demo Farms Located in the Marginal Upland, Hilly Land, and Highland					
2-1-1 Action Plan of the Techno-demo Farms (Including Organizing Several Task Forces and Committees)					
2-1-2 Characterization of Vegetation, Soils and Water Resources in the Pilot Watersheds					
2-1-3 Indigenous Agriculture Technologies and Market Research					
2-2 Introduction of Appropriate Soil and Water Technologies to the Techno-demo Farms Located in the Marginal Upland, Hilly Land, and Highland					
2-2-1 Introduction of Developed Soil and Water Management Technologies					
2-2-1-1 Water Management Technologies					
2-2-1-2 Soil Conservation Technologies					
2-2-1-3 Soil Productivity Improvement Technologies					
2-2-2 Integration of Agriculture Technologies					
2-2-2-1 Evaluation on Social-Economic Aspects (both techno - non techno demo)					
2-2-2-2 Development of Cropping Systems with Pest Control Technologies					
2-2-2-3 Selection of Crops of the Market Demand Concerned					
2-2-3 Training for Farmer-Cooperators					
2-2-3-1 Technical Seminar for Farmers (including promotion and dissemination)					
2-2-3-2 Periodic Guidance/Supervision for Farmers					
2-2-4 Monitoring and Evaluation of the Techno-demo Farms					
2-2-4-1 Implementation of Effective Demonstration Techniques					
2-2-4-2 Evaluation of the Effectiveness of Demonstration					

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ANNEX 2 Tentative PROJECT DESIGN MATRIX (PDM)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
OVERALL GOAL The soil and water management technologies contributing to the stable and sustainable agricultural production in the pilot marginal lands are adopted.			
PROJECT PURPOSE The soil and water management technologies suitable for the pilot marginal lands are established.			
OUTPUT 1. The soil and water management technologies for techno-demo farms are developed. 2. Developed soil conservation and water management technologies are verified in the techno-demo farms. 3. A system for monitoring and evaluation of the Project is established.			
ACTIVITIES I. Development of Soil and Water Management Technologies for Farmers' Participatory Techno-demo Farms 1-1 Development of Agricultural Resources Information System 1-2 Development of Water Resources Management Technologies 1-3 Assessment of Soil Conservation System on Soil Productivity and Environment 1-4 Improvement of Productivity of Marginal Soils with Environmental Conservation II. Establishment of Farmers Participated Techno-demo Farms to Disseminate Soil and Water Management Technologies 2-1 Planning of the Techno-demo Farms Located in the Marginal Upland, Hilly Land, and Highland 2-2 Introduction of Appropriate Soil and Water Technologies to the Techno-demo Farms Located in the Marginal Upland, Hilly Land, and Highland	INPUTS <i>Japanese Side</i> (a) Dispatch of Japanese Experts 1) Long-Term Experts a. Team Leader b. Coordinator c. Long-term experts in the fields of Soil and Land Evaluation, Soil Fertility Management, and Soil Conservation 2) Short-Term Experts Short-term experts may be dispatched, when necessity arise, for the smooth implementation of the project. (b) Acceptance of Counterpart Personnel in Japan for training Acceptance of counterpart personnel to the Japanese experts for training in Japan shall be arranged during the cooperation period. (c) Provision of Machinery and Equipment Necessary machinery, equipment and other materials (hereinafter referred to as "the Equipment") for the implementation of the Project will be provided within budgetary limitations.	<i>Philippine Side</i> (a) Provision of the buildings and facilities in the site necessary for the implementation of the Project. (1) Land, buildings and facilities needed for the implementation of the Project (2) Rooms and space necessary for installation and storage of the equipment (3) Office space and necessary facilities for the Japanese Team Leader, Coordinator and other Japanese Experts (4) Other facilities mutually agreed upon, if necessary (b) Assignment of the necessary number of full-time/part-time counterpart Personnel to work with the Japanese long-term experts, and administrative and technical staff to support the activities of the Project. (c) Sound budgetary allocation for the smooth commencement and successful implementation of the Project. 1) Expenses necessary for domestic transportation of the Equipment in the Republic of the Philippines, as well as for its installation, operation and maintenance. 2) Customs, duties, internal taxes and other charges imposed on the Equipment in the Republic of the Philippines 3) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment 4) Supply or replacement of materials necessary for the management of techno-demo farms. 5) All operating expenses necessary for the implementation of the Project (d) Coordination and harmonization with related institutions	

ANNEX 3 ITEM AND COUNTERPART PERSONNEL

ITEM	COUNTERPART PERSONNEL	
	CHAIRMAN	MEMBERS
I. Development of Soil and Water Management Technologies for Farmers' Participatory Techno-demo Farms		
1-1 Development of Agricultural Resources Information Systems		
1-1-1 Inventory of Agricultural Resources and Information Systems		
1-1-1-1 Review of Information System	Gina Nilo	Cleotilde Nicolas Rodelio Carating Juliet Manguerra Jovette Tenorio Cristy Perlado
1-1-1-2 Soil Resources Inventory	Clarita Bacatio	Rizal: Oscar Costelo Bulacan: Virgilio Castañeda Bukidnon: Raymundo Galanta Andres Calimutan Jessica Torrior
1-1-1-3 Land Resources Inventory	Edna Samar	Rizal: Silvino Fello Bulacan: Emiliano Sibolboro Bukidnon: Nestor Ticzon Andres Calimutan
1-1-1-4 Water Resources Inventory	Teresita Sandoval	Oscar Carpio Diosdado Manalus Ernesto Brampio Andres Calimutan
1-1-2 Design and Development of the Agricultural Resources Information System		
1-1-2-1 Information System Framework	Wilfredo Cabezon	Alejandro Micoso Nestor Ticzon Clarita Bacatio Edna Samar Cleotilde Nicolas Emiliano Sibolboro Gina Nilo Rodelio Carating Cristy Perlado

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ITEM	COUNTERPART PERSONNEL	
	CHAIRMAN	MEMBERS
1-1-2-2 Methods of Data Encoding-Decoding	Rodelio Carating	Julieta Espineli Ana Rhodora Abat Andrew Flores Jessica Torrion
1-1-2-3 Methods of Information Analysis	Gina Nilo	Cleotilde Nicolas Juliet Manguerra Jovette Tenorio Andrew Flores Mario Vinluan
1-1-2-4 Information Linkage/Network	Andrew Flores	Rodelio Carating Antonio Rivera Cecille Orlanes Angelita Marcia MaryJane dela Cruz Ana Rhodora Abat Katherine Masbang
1-1-2-5 Reliability and Scalability of the System	Cleotilde Nicolas	Nestor Ticzon Clarita Bacatio Edna Samar Emiliano Sibolboro Gina Nilo Rodelio Carating Cristy Perlado
1-1-3 Application of the Developed Agricultural Resources Information System		
1-1-3-1 Methods of Utilization of the Agricultural Resources Information System	Cleotilde Nicolas	Rodelio Carating Ana Rhodora Abat Mario Vinluan
1-1-3-2 Simulation Model for the Environmental and Productivity Management for Pilot Watershed	Gina Nilo	Juliet Manguerra Cristy Perlado Andrew Flores Angelita Marcia Jovette Tenorio
1-1-3-3 Evaluation of the Developed Agricultural Resources Information System	Edna Samar	Teresita Sandoval Cecille Orlanes Arnulfo Gesite Nestor Ticzon Clarita Bacatio Cleotilde Nicolas Emiliano Sibolboro Gina Nilo Rodelio Carating Cristy Perlado Bayani Villanueva Joseph Rojas Esperanza Dacanay

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ITEM		COUNTERPART PERSONNEL	
		CHAIRMAN	MEMBERS
1-2	Development of Water Resources Management Technologies		
1-2-1	Development of the Methods for Identification and Fluctuation Simulation of Water Resources in the Pilot Watersheds		
1-2-1-1	Methods for Identification of Existence and Fluctuation Resources	Teresita Sandoval	Oscar Carpio Diosdado Morales Ernesto Brampio Mario Collado
1-2-1-2	Existence and Fluctuation of Water Resources	Samuel Contreras	Oscar Carpio Diosdado Morales Ernesto Brampio Mario Collado Mario Vinluan Elvira Bautista
1-2-1-2	Methods for Fluctuation Simulation of Water Resources	Oscar Carpio	Henry Cacayan Diosdado Morales Ernesto Brampio Redentor Gatus Mario Vinluan Elvira Bautista
1-2-2	Development of the Technologies for Water Resources for the Marginal Land		
1-2-2-1	Water Collection Technologies	Teresita Sandoval	Oscar Carpio Diosdado Morales Ernesto Brampio Mario Collado Rosemelinda Reforma Sonia Salguero
1-2-2-2	Water Storage Technologies	Samuel Contreras	Oscar Carpio Diosdado Morales Ernesto Brampio Mario Collado Rosemelinda Reforma Sonia Salguero
1-2-2-3	Water Conservation Techniques	Oscar Carpio	Oscar Carpio Diosdado Morales Ernesto Brampio Mario Collado Rosemelinda Reforma Sonia Salguero

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ITEM	COUNTERPART PERSONNEL	
	CHAIRMAN	MEMBERS
1-2-3 Development of the Methods for Utilization of Water Resources for the Marginal Land		
1-2-3-1 Criteria for Water Distribution	Samuel Contreras	Oscar Carpio Diosdado Morales Ernesto Brampio Mario Collado Rosemelinda Reforma Sonia Salguero
1-2-3-2 Water Distribution Techniques	Teresita Sandoval	Henry Cacayan Diosdado Morales Ernesto Brampio Redentor Gatus Mario Vinluan Elvira Bautista Danilo Adriatico
1-3 Assessment of Soil Conservation System on Soil Productivity and Environment		
1-3-1 Assessment of Soil Conservation Technologies on Soil and Water Qualities		
1-3-1-1 Assessment of Hedgerow with Trees and Shrubs on Soil and Water Qualities	Redentor Gatus	Jose Manguerra Edgardo Reyes Leonardo de Leon Mercedes Fernando Wilfredo dela Cruz Oscar Carpio
1-3-1-2 Assessment of Perennial Plants on Soil and Water Qualities	Redentor Gatus	Jose Manguerra Edgardo Reyes Leonardo de Leon Eliosa Go Ernesto Brampio Jose Bura
1-3-1-3 Assessment of Permeability Improvement Strips on Soil and Water Qualities	Redentor Gatus	Jose Manguerra Edgardo Reyes Leonardo de Leon Isagani Urriza Henry Cacayan Sunny de Guzman Jessica Torrior
1-3-2 Assessment of Soil Conservation Technologies on Productivity		
1-3-2-1 Assessment of the Soil Conservation Technologies on Crop Yield	Redentor Gatus	Jose Manguerra Edgardo Reyes Leonardo de Leon Salvador Balading Henry Apolinar Antonio San Andres

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ITEM	COUNTERPART PERSONNEL	
	CHAIRMAN	MEMBERS
1-3-2-2 Assessment of the Soil Conservation Technologies on Nutrient Uptake and Loss	Redentor Gatus	Jose Manguerra Edgardo Reyes Leonardo de Leon Joseph Rojas Rogelio Creencia Aida Latoza Jessica Torrior
1-4 Improvement of Productivity of Marginal Soils with Environmental Conservation		
1-4-1 Development of Effective Fertilization for Marginal Soils		
1-4-1-1 Analysis of Constraints on Crop Production in Marginal Soils	Redemcion Grifal	Amelia Bangalan Josie Mercado Betty Magno Elisa Ayo Elvira Bautista
1-4-1-2 Nutrient Dynamics Including Immobilization and Mineralization in Marginal Soils	Celia Grospe	Isagani Gavino Urriza Jaqueline Rojas Carlos Serrano
1-4-1-3 Use and Optimization of Organic and Inorganic Materials in Marginal Soils and Their Residual Effects	Imelda Santos	Salvador Villarey Raul Villacorta Apolinario Carandang
1-4-2 Improvement of Fertility of the Marginal Soils		
1.4.2.1 Soil Fertility with Suitable Cropping Systems	Amy Yambot	Violeta Castañeda Celso Bersabe Purísima Pajaro Manuel Dugan Virgincito Estoconing
1.4.2.2 Utilization and Interaction Between Microorganisms and Plants in Marginal Soils	Marcelina Palis	Leogarda Rubite Alma Gonzales Digna Allag

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ITEM	COUNTERPART PERSONNEL	
	CHAIRMAN	MEMBERS
II. Establishment of Farmers Participated Techno Demo Farms to Disseminate Soil and Water Management Technologies		
2-1 Planning of the Techno-demo Farms Located in the Marginal Upland, Hilly Land, and Highland	Rizal: Florencio Mananghaya	Rizal Project Management Team
	Bulacan: Crisostomo Alcalde	Bulacan Project Management Team
	Bukidnon: Jose Manguerra	Bukidnon Project Management Team
2-1-1 Action Plan of the Techno-demo Farms (Including Organizing Several Task Forces and Committees)		
2-1-2 Characterization of Vegetation, Soils and Water Resources in the Pilot Watersheds		
2-1-3 Indigenous Agriculture Technologies and Market Research	Cristy Perlado	Bulacan : Edna Samar Juliet Manguerra Ana Rhodora Abat Jovette Tenorio
		Rizal : Cleotilde Nicolas Edgar Natividad Julieta Espineli May Babaran
		Bukidnon : Cristy Perlado May Babaran Edgar Natividad Jovette Tenorio
2-2 Introduction of Appropriate Soil and Water Technologies to the Techno-demo Farms Located in the Marginal Upland, Hilly Land, and Highland		
2-2-1 Introduction of Developed Soil and Water Management Technologies	Farm Managers	Members of Project Management Team
2-2-1-1 Water Management Technologies		
2-2-1-2 Soil Conservation Technologies		
2-2-1-3 Soil Productivity Improvement Technologies		
2-2-2 Integration of Agriculture Technologies	Farm Managers	Members of Project Management Team

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ITEM	COUNTERPART PERSONNEL	
	CHAIRMAN	MEMBERS
2-2-2-1 Evaluation on Social-Economic Aspects	Edna Samar	Bulacan : Edna Samar Juliet Manguerra Ana Rhodora Abat Jovette Tenorio Rizal : Cleotilde Nicolas Edgar Natividad Julieta Espineli May Babaran Bukidnon : Cristy Perlado May Babaran Edgar Natividad Jovette Tenorio
2-2-2-2 Development of Cropping Systems with Pest Control Technologies		
2-2-2-3 Selection of Crops of the Market Demand Concerned	Cleotilde Nicolas	Bulacan : Edna Samar Juliet Manguerra Ana Rhodora Abat Jovette Tenorio Rizal : Cleotilde Nicolas Edgar Natividad Julieta Espineli May Babaran Bukidnon : Cristy Perlado May Babaran Edgar Natividad Jovette Tenorio
2-2-3 Training for Farmer-Cooperators including Technology Promotion and Dissemination	Mercedes Fernando & Georgina Siena	Members of Project Management Team Ma. Angelita Esguerra Ma. Perpetua Ocampo Katherine Masbang
2-2-3-1 Technical Seminar for Farmers		
2-2-3-2 Periodic Guidance/Supervision for Farmers		
2-2-4 Monitoring and Evaluation of the Techno-demo Farms	Farm Managers	Members of Project Management Team
2-2-4-1 Implementation of Effective Demonstration Techniques	Farm Managers	Members of Project Management Team
2-2-4-2 Evaluation of the Effectiveness of Demonstration	Farm Managers	Members of Project Management Team

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