C/P研修員リスト

Note: In case a counterpart's employment is temporary, enter "*" in Remarks

No.	Name of Counterpart	Field	Present Post Post at assignment time	Remarks	Period of Assignment From	 To	2003	2004	2005	2006	Training in Japan Year	 Name of Training Course	 Duration
1	Ms. Jiraporn Tayutiwultikul	Entomology	Assist. Prof. Dr.		2004.03.30	2004.04.29	x					Insect damage and insect identification (1-2-2)	1 Month
2	Ms. Chuanpit Boonchitsirikul	Plant Pathology	PhD., Lecturer		2004.03.30	2004.04.29	x					Disease diagnosis and pathogen identification (1-2-1)	1 Month
3	Mr. Worapun Varaha	DOAE	Extensionist		2004 03.30	2004.04.29	x					Extension of agricultural technology (3)	1 Month
4	Mr. Choochad Santasup	Central Labolatory Fac. of Agriculture	PhD., Agriculturist		2004.05.31	2004.06.29		x				Agrochemical residue analysis (2-2)	1 Month
5	Ms. Weenun Bundithaya	Horticulture	PhD., Lecturer		2004.05.31	2004.06.29		x				Cultivation technology with appropriate use of agrochemicals (Biological control) (2-6-2)	1 Month
6	Mr. Attachai Jintrawet	Soil Science	Assoc. Prof. Dr.		2004 05.23	2004.06.12		x				Information technology in agriculture (3-3)	3 Weeks
7	Ms. Angsana Akarapisan	Plant Pathology	PhD., Lecturer		2004.08.29	2004.09.25		x				Tolerance of pathogens to target pesticides (2-4-1)	3 Weeks
8	Mr. Pornchai Lucang-a-pa-pong	Agronomy	Assoc. Prof. Dr.		2004.09.23	2004.10.14		x				Agricultural extension (3)	3 Weeks
9	Mr. Surapun Pantajuk	DOAE	Extensionist		2004 09.23	2004.10.14		x				Agricultural extension (3)	3 Weeks
10	Ms. Kaewalin Kunasakdakul	Plant Pathology	Assist. Prof. Dr.		2005.05.16	2005.06.10			x			Pest diagnosis and identification of disease causing bacteria (1-2-1)	3 Weeks
11	Ms. Kanita Ueangsawat	Soil Science	Agriculturist		2005.05.16	2005.06.10			x			Detection of residue pesticides in the soil of the agricultural field (2-6-5)	3 Weeks
12	Ms. Nuttha Kuanprasert	Horticulture	Assist. Prof. Dr.		2005.09.8	2005.09.29			x			Reducing pesticides farming technology (2-6-3)	3 Weeks
13	Mr. Prayut Suksomjit	DOAE	Extensionist		2005 09.8	2005.09.29			x			Extension of agricultural technology (3-1)	3 Weeks
14	Ms. Arawan Shutsrirung	Soil Science	Dr., Agriculturist		2005.09.26	2005.10.25			x			Reducing pesticides farming technology (2) (2-6-3)	1 Month
15	Mr. Karn Kongbuntad	IT Center Fac. of Agriculture	Programmer		2005.09.26	2005.10.21			x			IT technology (Building website) (3-3-1)	3 Weeks
16	Mr. Sawai Buranapanichpan	Entomology	Assoc. Prof. Dr.		2005 10.3	2005.10.21			x			Detection technology for pesticide resistance pest (2-4-2)	3 Weeks
17	Ms. Sarunya Valyasevi	Plant Pathology	PhD., Lecturer		2006.04.9	2006.04.30				x		Tolerance of pathogens to target pesticide (2-4-1)	3 Weeks
18	Mr. Pittaya Sruamsiri	Horticulture	Assist. Prof. Dr.		2006.05.7	2006.05.27				x		Field sanitation techniques to reduce use of agrochemical (2-6-5)	3 Weeks
19	Mr. Sombat Srichuwong	Plant Pathology	Assoc. Prof. Dr.		2006 05.7	200.6 05.27				x		Extension of agricultural technology (3-1)	3 Weeks
20	Ms. Daruni Naphrom	Horticulture	PhD., Lecturer		2006.06.12	2006.07.1				x		Biocontrol using beneficial organisms (2-6-2)	3 Weeks
21	Mr. Tanachai Pankasemsuk	Horticulture	PhD., Lecturer		2006.07.2	2006.07.23				x		Analyze agrochemical residues in products at the chemical residue analysis center (2-2)	3 Weeks
22	Mr. Thanin Phuntein	DOAE	Agriculturist		2006.07.2	2006.07.23				x		Extension of information (3)	3 Weeks

Prepared on May 3, 2006

日本側投入予算

JICA Supported Budget (2004 – 2006 JFY)

Period	Budget (Baht)							
	Group							
	Rose	Tangerine	Crucifer	Analysis	Extension	IT	Administration	Total
1. 2004 JFY	70,000	70,000	70,000	50,000	50,000	50,000	280,000	640,000
2. 2005 JFY	70,000	70,000	70,000	100,000	60,000	90,000	320,000	780,000
3. 2006 JFY	70,000	70,000	20,000	200,000	100,000	30,000	342,000	832,000
Total	**210,000**	**210,000**	**160,000**	**350,000**	**210,000**	**170,000**	**942,000**	**2,252,000**

タイ側投入予算

Thai Budget in 2004

No.	Source of budget/ Project name	Amount (Baht)	For activity
1.	Faculty of Agriculture, CMU	280,000	- Research budget for rose, crucifer and pesticide analysis
		30,000	- Field experiment at experimental farm at MCC “Partial plant nutrient balance of pesticide free vegetables”
		30,000	- Field experiment at experimental farm at Ping Noi Village “Partial plant nutrient balance of vegetable crops in the farmer’s field”
		26,000	- Soil Quality Testing Workshop at Rong Wua Daeng (Rose)
		26,000	- Soil Test Kit Workshop for the farmer at MCC (Crucifer)
		13,000	- Soil Test Kit Workshop for the farmers at San Pee Sua (Crucifer)
		13,000	- Soil Test Kit Workshop for the farmer from Chor Lae at MCC (Crucifer)
		206,433	- Soil Test Kit Workshop for students at Mae Sa Mai School (Fruit tree, cut flower, vegetable)
			- Administration budget from CMU
Other budget			
1.	Ministry of Industry	221,345	- training on soil management, pest management, and agrochemical free using
2.	Ministry of Education	800,000	- Demonstration plot - test kit development - technology transfer
3.	NSTDA	537,600	- research and development - natural pesticide from plant on high land for controlling disease and insect in vegetable
4.	Ministry of Public Health	150,000	- survey and producing - agrochemical shop map in northern Thailand

2004 Total　　2,333,378 Baht

Thai Budget in 2005

No.	Source of budget/ Project name	Amount (baht)	For activity
1.	Faculty of Agriculture, CMU	50,825	- maintenance pure water distillation machine for GC and HPLC
		17,120	- maintenance pure water distillation machine for GC and HPLC
		8,239	- maintenance vapors machine
		50,000	- chemical residue analysis development
		48,685	- maintenance pure water distillation for GC and HPLC
		6,550	- maintenance balance
		8,239	- equipment for GC
		2,343	- chemical and equipment
Other budget			
1.	Agricultural production development for community's safety (Ministry of Public Health)	221,345	- training on soil management, pest management, and agrochemical free using
2.	Production of agrochemical free vegetable and eatable flowers (Ministry of Public Health)	800,000	- Demonstration plot - test kit development - technology transfer
3.	The Royal Project Foundation	537,600	- research and development - natural pesticide from plant on high- land for controlling disease and insect in vegetable
4.	Survey of agrochemical shops in Northern Thailand (National Food Institute)	150,000	- survey and producing - agrochemical shop map in northern Thailand
5.	Evaluation of soil fertility project	22,356	- chemical and equipment for chemical residue analysis
		10,638	- Maintenance GC
6.	Service for feed analysis and domestic animal production	29,425	- maintenance UPS for HPLC
		2,750	- maintenance of glassware
7.	Quality and chemical residue analysis in honey	84,000	- hiring assistance research for chemical residue analysis
		19,212	- maintenance automatic transfer pipette
		68,297	- maintenance HPLC (changed CPU, lamp, check valve)
		59,507	- chemical and equipment for chemical residue analysis

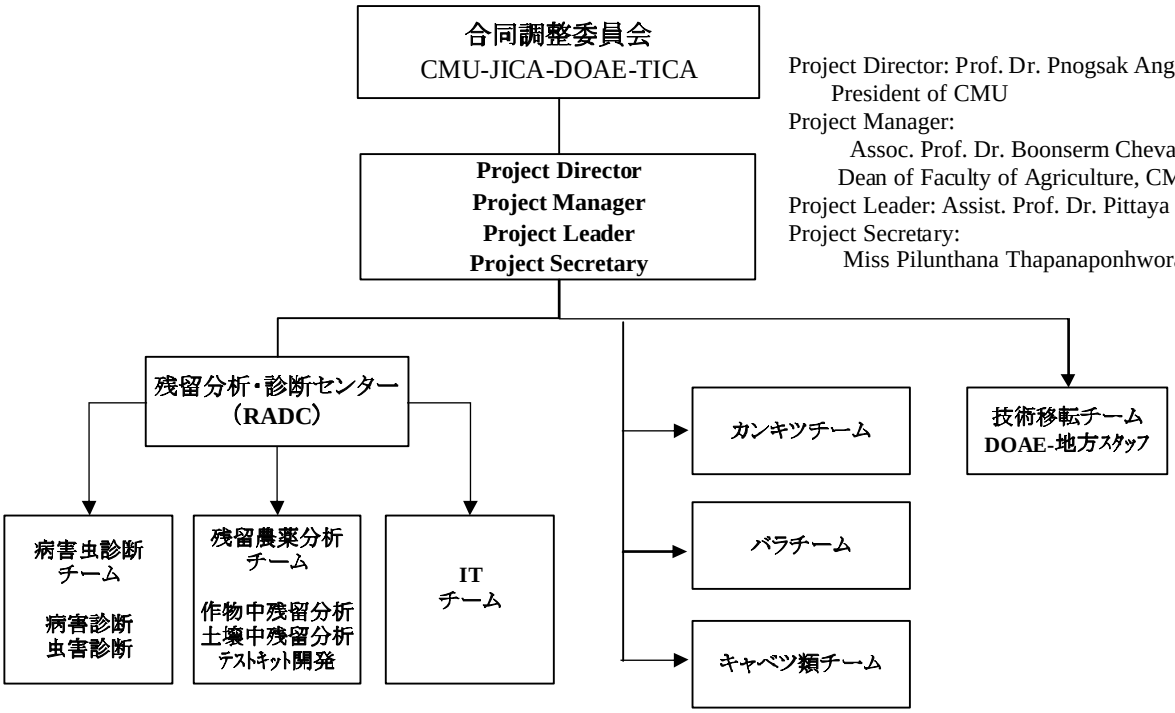
2005 Total 2,197,131 Baht

Thai Budget in 2006

No.	Source of budget/ Project name	Amount (Baht)	For activity
1.	Faculty of Agriculture, CMU	28,980 4,124	- maintenance pure water distillation machine for GC and HPLC - glove, mask and others
Other budget			
1.	Farmers' Field School for tangerine supported by Wieng Local Organization	100,000	- material and supply - lunch for farmers and resource persons - accommodation for resource persons
2.	DOAE expense for Farmers' Field School	20,000	- perdium for facilitators - demonstration materials
3.	Production of agrochemical free vegetable and eatable flowers (Ministry of Public Health)	1,088,560	- demonstration plot - test kit development - technology transfer
4.	Farmer participating in self vegetable production supplying to the market (Ministry of Public Health)	800,000	- survey of agrochemical use by farmer - find out what farmer's problem - farmers participating-activity for safe vegetable production
5	Highland Research Development Institute (HRDI)	60,000	- workshop on soil quality test kit for Afghanistian
6	Quality and chemical residue analysis in honey	84,000	- hiring assistant researcher for chemical residue analysis

2006 Total 2,185,664 Baht

プロジェクト組織図とタイ側C/Pリスト



Project Director: Prof. Dr. Pnogsak Angkasith
President of CMU
Project Manager:
Assoc. Prof. Dr. Boonserm Cheva-Isaraku,
Dean of Faculty of Agriculture, CMU
Project Leader: Assist. Prof. Dr. Pittaya Sruamsiri
Project Secretary:
Miss Pilunthana Thapanaponhworakul,

残留農薬分析とテストキット開発チーム
1. Assoc. Prof. Dr. Soraya Ruamrungsri, Horticulture
2. Dr. Weenun Bundithya, Horticulture
3. Dr. Tanachai Pankasemsuk, Horticulture
4. Dr. Sarunya Valyasevi, Plant Pathology
5. Dr. Choochard Santasup, Central Laboratory
6. Ms. Kanokwan Sringarm, Central Laboratory
7. Ms. Suratwadee Pak-u-thai, Central Laboratory

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1. Assoc. Prof. Dr. Attachai Jintrawet, Soil Science
2. Mr. Karn Kongbuntad, MIS Center
3. Mr. Ratchabhum Jaikla, MCC
4. Mr. Anirut Promsuk, ATRACT

技術移転チーム
1. Assoc. Prof. Dr. Pornchai Lueang-a-papong, Agronomy
2. Assist. Prof. Dr. Ampan Bhromsiri, Soil Science
3. Mr. Prayut Suksomjit, DOAE Coordinator
4. Mr. Thanin Phantein, DOAE, IPM Coordinator
5. Mr. Wichai Sriphongarm, DOAE staff
6. Ms. Phasita Keawluemsai, DOAE staff

キャベツ類チーム
1. Dr. Chuampit Boonchitsirikul, Plant Pathology
2. Assoc. Prof. Dr. Sombat Srichuwong, Plant Pathology
3. Assist. Prof. Dr. Kaewalin Kunasakdakul, Plant Pathology
4. Dr. Sarunya Valyasevi, Plant Pathology
5. Assic. Prof. Dr. Soraya Ruamrungsri, Horticulture
6. Assoc. Prof. Dr. Sawai Buranapanichpan, Entomology
7. Assoc. Prof. Dr. Pornchai Lueng-a-Papong, Agronomy
8. Assist. Prof. Dr. Ampan Bhromsiri, Soil Science
9. Dr. Arawan Shutsrirung, Soil Science
10. Mrs. Kanita Uaengsawat, Soil Science
11. Ms. Kanokwan Sringarm, Central Laboratory
12. Ms. Suratwadee Pak-u-thai, Central Laboratory

バラチーム
1. Assis. Prof. Dr. Nutta Kuanprasert, Horticulture
2. Assoc. Prof. Dr. Soraya Ruamrungsri, Horticulture
3. Dr. Weenun Bundithya, Horticulture
4. Assoc. Prof. Dr. Sawai Buranapanichpan, Entomology
5. Assit. Prof. Dr. Jirapron Tayutivutikul, Entomology
6. Assoc. Prof. Dr. Pornchai lueang-a-papong, Agronomy
7. Dr. Angsana Akrapisarn, Plant Pathology
8, Assist. Prof. Dr. Ampan Bhromsiri, Soil Science
9. Dr. Arawan Shutsrirung, Soil Science
10. Mrs. Kanita Uaengsawat, Soil Science
11. Dr. Choohard Santasup, Central Laboatory

カンキツチーム
1. Assist. Prof. Dr. Ampan Bhromsiri, Soil Science
2. Dr. Arawan Shutsrirung, Soil Science
3. Mrs. Kanita Uaengsawat, Soil Science
4. Aooc. Prof. Dr. Sombat Srichuwong, Plant Pathology
5. Dr. Saruya Valyaseri, Plant Pathology
6. Assoc. Prof. Dr. Soraya Ruamrungsri, Horticulture
7. Dr. Tanachai Pankasemsuk, Horticulture
8. Dr. Darunee Naphrom, Horticulture
9. Assit. Prof. Dr. Jiraporn Tayutivutikul, Entomology
10. Assoc. Prof. Dr. Pornchai Lueang-a-papong, Agronomy
11. Dr. Choochad Santasup, Central Laboratory
12. Ms. Kanowkwan Sringarm, Central Laboratory
13. Ms. Suratwadee Pak-u-thai, Central Laboratory

プロジェクト実施計画 （Plan of Operation）

活動	目標	2003		2004				2005				2006			Chief C/P	Input
		III	IV	I	II	III	IV	I	II	III	IV	I	II	III		
1.現状把握のための実態調査															診断C/P	診断C/P
1-1 プロジェクト関連事項の調査	プロジェクトのベースライン	←												→		
1-1-1 モデル農家の一般情報の収集	病虫害、農薬のベースライン															
1-1-2 モデル農家の栽培作物に関する一般情報の収集	年間通しての病虫害・雑草発生と被害															
1-2 モデル農家における病虫害及び雑草に関する調査		←												→		
1-2-1 季節的病害発生及び被害に関する調査																
1-2-2 季節的虫害発生及び被害に関する調査																
1-2-3 季節的雑草発生及び被害に関する調査	年間通しての農薬・肥料の使用実態															
1-3 モデル農家における農薬使用実況調査		←												→		
1-3-1 季節的殺菌剤の使用状況調査																
1-3-2 季節的殺虫剤の使用状況調査																
1-3-3 季節的除草剤の使用状況調査																
2. 農薬・肥料の適正使用技術															分析C/P	分析C/P
2-1 試験対象とする農薬の選定																
2-2 残留分析・診断センターにおける農作物中の残留農薬分析	農薬使用と作物上の残留の関係			←										→		
2-2-1 有機リン系農薬の分析																
2-2-2 カーバメート系農薬の分析																
2-2-3 肥料の分析																
2-3 分析センターと土壌分析室における農場土壌中の残留農薬分析	農薬・肥料の使用と農場土壌中の残留の関係			←										→		
2-3-1 有機リン系農薬の分析																
2-3-2 カーバメート系農薬の分析																
2-3-3 肥料の分析																
2-4 残留分析・診断センターにおけるモデル農家に発生した病原菌と害虫の薬剤耐性試験	最適な農薬使用の提案			←										→		
2-4-1 殺菌剤に対する病原菌の耐性																
2-4-2 殺虫剤に対する害虫の耐性																
2-5 タイで使用されている残留農薬検出のための簡易キットの改良	作物及び土壌中の残留農薬の正確な検出	←												→		
2-5-1 有機リン系農薬の残留																
2-5-2 カーバメート系農薬の残留																
2-6 モデル農家で農薬・肥料の適正使用を確立するための圃場試験の実施			←											→		
2-6-1 作物の栽培技術と圃場衛生	農薬の使用削減が取込まれる															
2-6-2 有用微生物による生物防除	農薬・肥料への代替技術															
2-6-3 農薬の適正な散布頻度	省農薬のための栽培技術の完成			←										→		
2-6-4 省農薬のための生物防除資材及び生物農薬																
2-6-5 省農薬のための圃場衛生技術																
3 有用情報の普及															IT C/P	IT C/P
3-1 モデル農家での農家及び普及員への適正農薬・肥料使用のデモンストレーション							←							→		
3-1-1 モデル農家でのデモンストレーション																
3-1-2 診断センターでの病害虫のコンサルテーション																
3-1-3 残留分析センターでの農薬・肥料のコンサルテーション																
3-1-4 土壌成分試験																
3-2 適正農薬・肥料使用のためのセミナー、ワークショップ実施							←							→		
3-2-1 セミナー																
3-2-2 ワークショップ																
3-3 農薬・肥料の適正使用に関する情報提供のためのウェブサイト構築				←										→		
3-3-1 ウェブサイトのためのデータベース構築																
3-3-2 ウェブサイト構築																
合同調整委員会				●				●				●				

付属資料11 プロジェクト実施計画

JOINT EVALUATION REPORT
ON
THE JAPAN-THAILAND TECHNICAL COOPERATION PROJECT
ON
APPROPRIATE TECHNOLOGY FOR REDUCTION OF AGROCHEMICAL IN NORTHERN THAILAND

Chiang Mai, August 16th, 2006

Mr. Kunihiro Doi
Leader,
Japanese Evaluation Team
Japan International Cooperation Agency

Mr. Prayut Suksomjit
Leader,
Director, Farmers Promotion and Development Section,
The office of Agricultural Extension Region 6, Chiang Mai,
Department of Agricultural Extension
Ministry of Agriculture and Cooperatives

Table of Contents

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2. PDM and Plan of Operation
3. Evaluation Grid
4. Short-term Japanese Experts
5. Provision of Equipment
6. Assignment of Counterpart/Training in Japan
7. Financial Input
8. Insects, diseases and pesticides and verified appropriate technologies
9. Outputs

JOINT EVALUATION REPORT
ON
THE JAPAN-THAILAND TECHNICAL COOPERATION PROJECT
ON
APPROPRIATE TECHNOLOGY FOR REDUCTION OF AGROCHEMICAL IN NORTHERN THAILAND

1. Introduction

1.1 Objectives of the Evaluation

The evaluation activities were performed with the following objectives:

(1) To review the degree of achievements of the Project, in accordance with the original plan described in the Record of Discussions (R/D), Project Design Matrix (PDM) and Plan of Operations (PO).

(2) To evaluate the Project in terms of the five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact and Sustainability).

(3) To make recommendations and suggestions concerning the activities and progress to be taken in the Project toward the termination of the Project.

(4) To explain and feedback the results of evaluation to the Government of Japan, the Government of the Kingdom of Thailand and authorities concerned.

(5) To summarize the results of evaluation as lessons learned for similar projects in Thailand.

1.2 Members of the Joint Evaluation Team

(1) The Japanese Team

(a) Mr. Kunihiro DOI (Team Leader)
Executive Technical Advisor to the Director General, Rural Development Department, JICA

(b) Dr. Hitoshi KUNOH (Appropriate technology for reduction of agrochemicals)
Head, Institute for Biological Process Research, Akatsuka Garden Co., Ltd

(c) Mr. Yasuaki MOMITA (Planning Management)
Project Officer, Paddy Field Based Farming Area Team II, Group I, Rural Development Department, JICA

(d) Mr. Kazumi UENO (Evaluation Analysis)
General Manager, Consultants Department, Overseas Merchandise Inspection Co., Ltd.

(2) The Thai Team

(a) Mr. Prayut SUKSOMJIT (Leader)

Director, Farmers Promotion and Development Section, The office of Agricultural Extension Region 6, Chiang Mai, Department of Agricultural Extension, MOAC

(b) Ms. Suthanone FUNGTAMMASAN

Programme Officer, Technical and Evaluation Unit, Office of the Director General, TICA, Ministry of Foreign Affairs

1.3 Schedule of the Study

The detailed schedule of the joint evaluation study is attached as Annex 1.

2. Outline of the Project

2.1 Background of the Project

Recently, using agrochemical both fertilizer and pesticide are increasing in Thailand. If such trend continues, there is concerned over agrochemicals used in northern high land area would environmentally pollute soil and water which connect to downstream area. Pesticide residues in some crops were actually found over government limitation in the market and it had become serious issues for consumers. Also for farmers, more than fifty percent of population, health hazard with pesticide use and increasing cost for agrochemicals have been big problems.

Thai Government established National Bureau of Agricultural Commodity and Food Standards (ACFS) under Ministry of Agriculture and Cooperatives (MOAC) as a new agency on 2002, based on recognition of the above mentioned problems. Also, under the 9th National Social and Economic Development Plan (2002-2006), review of pesticide measures for consumer protection and production of safe products with international competitiveness for export are characterized as the pillar of agricultural policy.

Thai Government also gave instructions to develop methods to reduce pesticide use and its residues in crops to universities and research institutes recognizing the importance of pesticide issues in agricultural sector, but the progress has been slow due to the lack of technology and extension system to reduce agrochemicals.

With the above background, Thai Government requested Japanese Government a

technical cooperation project to disseminate information and to establish guidelines for appropriate agrochemical usage to reduce pesticides application in Northern Thailand, problem occurring area with a lot of pesticide use.

JICA dispatched the ex-ante evaluation team on May 2003 to confirm project background and framework to sign Record of Discussion on October 2003, and the technical cooperation has started from November 2003 for three years.

2.2 Summary of the Project

The Project is implemented at the Faculty of Agriculture in Chiang Mai University (CMU) as main site. Residue Analysis and Diagnosis Center (RADC), established in the campus with the Project, is promoting the Project in collaboration with DOAE, (1) to improve analytical technologies relevant to agrochemical usage for tangerine, rose and crucifer production, and (2) to strengthen the function of distributing useful information.

In terms of administration of the Project, both the president of CMU as the Project Director, and the Dean of Faculty of Agriculture of CMU as the Project Manager are responsible for the overall management of the Project. For the efficient and effective implementation of the Project, the Joint Coordination Committee (JCC) is established with the Project Director as chairman, and some representatives of DOAE join the JCC as members. Japanese short-term experts, dispatched from Kagawa University and Mie University, are providing necessary technical assistances and advices including project management.

The Japanese side provides short-term experts, server system for establishing Website, analytical equipments for pesticide residue analysis, and acceptance of the Thai counterparts for training in Japan, while the Thai side provides assignment of counterparts, facilities for implementing the Project, office spaces and necessary facilities for the Japanese expert, and budgetary allocation for running expenses including maintenance cost for equipment.

The project has following three main outputs:

1. Actual situation of pest and agrochemical usage are grasped at model farms based on objective data and crop season.
2. Appropriate ways of agrochemical usage for tangerine, rose and crucifer production are verified.

3. Information on analytical data of agrochemical residues and on safe and appropriate use of agrochemicals is disseminated.

3. Methodology of Evaluation

In the fist step of the evaluation, the Team assessed the degree and prospects of achievement of the Project Purpose and Outputs based on the revised PDM and revised PO attached as Annex 2.

In the second step, the implementation process was assessed and evaluated from the aspect of the Project management.

In the third step, the Team analyzed and evaluated the Project from the viewpoints of "Relevance", "Effectiveness", "Efficiency", "Impacts" and "Sustainability".

Finally, the Team made a set of recommendations and suggestions.

3.1 Evaluation Questions and Indicators

The Evaluation Grid is a table of evaluation work plan, and all components in the evaluation grid are interrelated to each other, and help the team develop the most appropriate work plan for conducting evaluation. See attached Annex 3.

3.2 Data Collection Method and Analysis

3.2.1 Data Collection Method

The Team carried out field survey and made interviews with the counterparts engaged in the Project, Japanese experts, and other people concerned. The Team also collected information through questionnaire from concerned personnel.

3.2.2 Criteria of Evaluation for Analysis

(1) Relevance

Relevance of the Project was reviewed as the validity of the Project Purpose and the Overall Goal in connection with the policies of both Thai Government and Japanese Government as well as the needs of beneficiaries.

(2) Effectiveness

Effectiveness was assessed by evaluating the extent to which the Project has achieved and contributed to the beneficiaries.

(3) Efficiency

Efficiency of the Project implementation was analyzed focusing on the relationship between outputs and inputs in terms of timing, quality and quantity.

(4) Impacts

Impacts of the Project were identified by referring to direct and indirect, positive and negative impacts caused by the Project.

(5) Sustainability

Sustainability of the Project was forecasted in organizational, financial and technical aspects by examining the extent to which the achievement of the Project would be sustained or expanded after the Project is completed.

4. Project Performances and Implementation Process

4.1 Accomplishment of the Project

Accomplishment of the Project was measured in terms of inputs, activities, outputs and Project purpose, all of which are based on the R/D, PDM and PO.

4.2 Inputs

According to the results of interview, study and observation, most of Inputs have been appropriate in terms of timing, quantity and quality made by both the Japanese and Thai sides. Lists of Inputs are attached in Annex 4 to Annex 7. The inputs of the Project were as follows;

<Japanese side>

Dispatch of short-term experts: Thirty two times (32)

Provision of machinery and equipment: 96 items, approx. 11.3 million THB (Approx. 34.0 million yen)

Counterpart training in Japan: Twenty-two person (22)

<Thai side>

Provision of land, buildings and facilities for the Project and Project office

Operational cost

Maintenance and repair cost for computers and equipment

Assignment of counterparts to each Japanese expert and supporting staff

4.3 Outputs

The degree to which each output has been achieved is described as below. For more detailed information, the current situation and the verification results are attached in Annex 8 and Annex 9.

Output 1: *Actual situation of pest and agrochemical usage are grasped at model farms based on objective data and crop season.*

Indicators: *Record of year-round data of more than 3 kinds of insect, disease and*

agrochemical for tangerine, rose, and crucifer are gathered.

Result (as of August 2006):

The following records of year-round data of insect, disease and pesticides for each crop are gathered and Output 1 is achieved.

In the guideline for each crop, following common insects, diseases and pesticides are shown as follows;

- *5 insects, 3 diseases and 20 pesticides for tangerine*
- *4 insects, 6 diseases and 17 pesticides for rose*
- *5 insects,, 4 diseases and 13 pesticides for crucifer*

Output 2: *Appropriate ways of agrochemical usage for tangerine, rose, and crucifer production are verified.*

Indicators:

2-1. Guidelines for 3 target crops are drafted.

2-2. Farmers at model farms decrease the frequency of agrochemical application by 30%.

Result (as of August 2006):

Output2 has been already achieved, as shown below.

2-1. The Guidelines for tangerine, rose and crucifer have already been drafted.

2-2. The frequency of pesticide application at model farms decreased averagely 58.3% using developed appropriate ways at RADC.

Output 3: *Information on analytical data of agrochemical residues and on safe and appropriate use of agrochemicals is disseminated.*

Indicators:

3-1. The website is set up.

3-2. The number of seminars/training for the farmers and concerned authorities including DOAE staffs and workshops for counterparts.
Seminar/Training on agrochemical usage (20 times with total 1,000 participants)

3-3. 30 pieces of manuscript/activities on the appropriate way to use agrichemicals (e.g. Article, Handbook, Handout, Manual, Radio program, TV program, Newspaper etc.)

3-4. *Three demonstration activities at the model farms(rose, crucifers and tangerine) and/or related facilities with the total participating farmers and DOAE staff of 100 persons.*

Project

Result (as of August 2006):

Output 3 has been achieved as shown below.

3-1. The website has already been set up to the public.

3-2. Based on accumulative report, the seminar/workshop were held twenty eight (28) times with totally 2,292 participants.

3-3. Based on accumulative report, thirty seven (37) manuscript/activities were issued with relative activities.

3-4. Three demonstrations were held at the model farms with 264 participants from farms and DOAE.

4.4 Achievement of the Project purpose

Project Purpose: *Analytical technology relevant to agrochemical usage for tangerine, rose and crucifer production is improved, and the function to distribute useful information is strengthened at the Residue Analysis and Diagnosis Center.*

The purpose of the project would be achieved as shown below.

Verifiable Indicators	Results (as of August 2006)
1. 15 kinds of organophosphate and 10 kinds of carbamate which farmers use in the farm can be analyzed with the accuracy of MOAC method. Before the Project, pesticide residue analysis could not be done.	RADC has been able to simultaneously analyze 15 kinds of organophosphate by GC and 10 kinds of carbamate by HPLC with modified MOAC method. The reliability is confirmed by percent recovery test.
2. RADC diagnoses 21 kinds (3 crops x 7 major diseases & insects) of major disease and insect damage in Northern Thailand. Before the Project, no regional data to identify diseases and insects, but only general information.	RADC has been able to diagnose 27 kinds of diseases and insects regionally occurring as follows: - 5 insects and 3 diseases in tangerine - 5 insects and 4 diseases in crucifer - 4 insects and 6 diseases in rose
3. The results of residue analysis and diagnoses as well as developed appropriate technologies are offered to farmers through more than 5 kinds of services. (Workshops, Seminars, Websites in internet Consultation , Farmers' Field School collaborated with DOAE)	RADC is providing the information on acquired appropriate technologies through 6 kinds of services such as workshops, seminars, broadcast, websites, consultation and farmers' field school collaborated with DOAE.

Before the Project, CMU could provide 2 kinds of services such as workshops and seminars.	

4.5 Achievement of the overall goal

Overall Goal: *Agrochemicals are used in appropriate ways based on precise diagnosis of disease, insect and weeding damage at agricultural fields in Northern Thailand.*

CMU has been tackling to achieve the overall goal in collaboration with DOAE as follows:

1. Improvement of training system on Farmers' Field School (FFS)
   CMU and DOAE are planning to improve FFS to expand appropriate technologies rapidly to the farmers by educating DOAE staff and farmer leader through TOT training.
2. Provision of the future budget
   CMU has coordinated with the local government and private sector for future training budget in cooperation with DOAE.

4.6 Implementation Process of the Project

The Project is keeping on the schedule of Plan of Operation and the decision by JCC, and the Project is to secure steady progress by the following monitoring system such as quarterly achievement report with monitoring meeting and semiyearly summary progress report by project manager in Thailand, and promotion conference for once a year and supporting committee meeting by two universities in Japan.

5. Evaluation Results

5.1 Relevance

(1) Relevance of the Project for the policy of Thai Government and Japanese Government

The relevance of the Project for Thai Government policy is high.

Thai Government now has a policy to promote Thailand as "The Kitchen of The World", and set up "Food Safety Year" on 2004. Especially MOAC is promoting to implement Good Agricultural Practice (GAP) as farm production procedures and its certification system to farmers. In the negotiation of Japan-Thailand Economic Partnership Agreement (JTEPA), the relevance of governments' concern is high because food safety cooperation has been treated on major issues between two countries.

(2) Relevance of the Project for needs of beneficiaries

The relevance of the Project for social .needs is very high.

Northern Thailand is a big fruit and vegetable production area with using a lot of fertilizer and pesticide, and some environmental problems are occurring not only for farmers but also for consumers because of the agrochemical residue exposures. Ministry of Public health had a survey for pesticide residue in this area for food safety project. The Faculty of Medicine in CMU also had a study on pesticide residues in blood, showing many children are affected in this area.

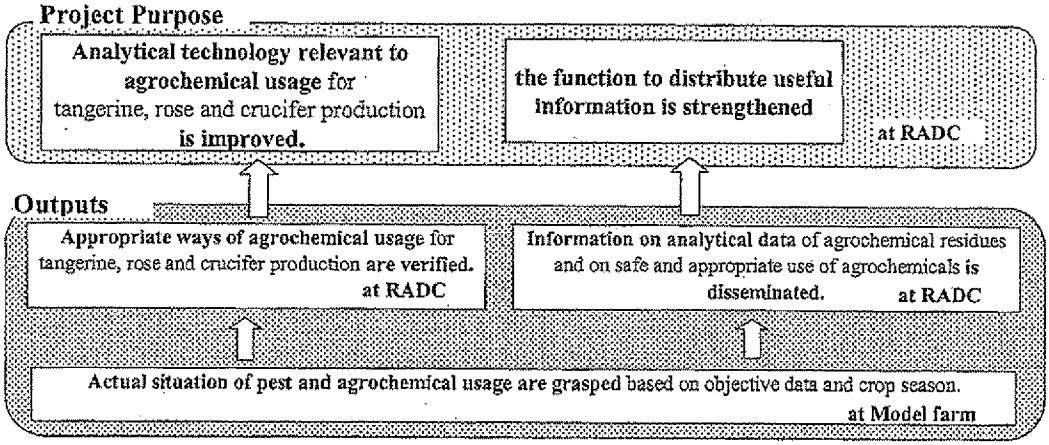
5.2 Effectiveness

(1) Achievement of project purpose

As mentioned in 4.4 Achievement of the Project purpose, project purpose will be achieved from the viewpoints of the indicators.

(2) Contribution of Project Outputs to the Project purpose

The project outputs have contributed to the project purpose as shown in the diagram below.



Regarding the result of Output 3, the fertilizer sausage and the soil test kit are two major appropriate technologies to mention; they were not developed according to the Plan of Operation; but were the products the Project originally came up with. It made the farmers easier to use and understand, contributing to the accomplishment of the project purpose.

5.3 Efficiency

(1) Efficiency of Japanese experts

The Project consisted of only short-term experts, including the quarterly dispatched "Project Management" experts. This made the Project efficient in the means of cost performance as well as that these short-term experts can provide flexible technology transfer in response to the requirements from CMU. On the other hand, input timings of those experts were inflexible due to the academic schedules of Mie University and Kagawa University .

(2) Efficiency of counterparts

The project had difficulties in the middle and long term activities, as the counterparts of CMU were also mostly professors and could not permanently involved in the Project.

A good result from this was that, as the member successfully formed the team for the Project, crossing over their fields.

It was possible since the number of the members had experienced to be counterparts in the previous project; it pledged the enthusiasm and quality of the Project, to develop to the further stage.

(3) Efficiency of procured equipment

The equipments procured in the Project were mostly appropriate. The project effectively utilized the equipments from the previous project, and carefully chose new equipments not to duplicate them. It efficiently helped RADC utilize the equipments of a high performance even saving the cost.

(4) Efficiency of counterpart trainings in Japan

The Project assigned all the counterparts to technical trainings by each expert in charge according to his/her needs. It made the trainings more effective, but sending all the counterparts made trainings insufficient, as training periods were limited within the operational budget due to the number of counterparts.

5.4 Impacts

(1) Responses from regional consumers

In CMU, Multiple Cropping Center (MCC) has a pesticide free market under Faculty of Agriculture and is technically supported by the Project. Consumers come to MCC every

Wednesday and Saturday and buy fresh fruits and vegetables grown with less agrochemicals; this can be considered as a positive impact by the Project, as it provides the opportunity for consumers to recognize the importance of safe products, using the appropriate technology developed by the Project.

(2) Joint research programs among universities and with private sector
As an unexpected result of the Project, formations of several joint researches among the 3 universities, in the fields of agrochemical tolerance of insects, biocontrol, etc. have been reported to the Team. Also, CMU is now undertaking a collaboration research program with a Japanese company on pesticide residue analysis. These programs show that the Project has been recognized as an advanced analytical center in this region, and the programs will provide the Project itself the opportunities to further researches.

5.5 Sustainability

(1) Political sustainability
Department of Land Development (DLD) now certifies the soil test kit developed by the Project as the official soil test kit, recognizing that it can be easily used by farmers to analyze soil conditions. It is expected to be used in farms all over the Thailand.

CMU started to coordinate with DOAE and the local government to continuously conduct FFS in wider areas after the Project period, aiming to accomplish the overall goal.

(2) Technical sustainability
The appropriate technologies developed by the Project were introduced to the Royal Project, which consists of 37 centers in Chiang Mai. With the advanced technologies, equipments, human resources and the network developed during the period, the Project now has the reliability to conduct further researches especially focused on the products in Northern Thailand on its own.

6. Conclusions

Through field observations and discussions with the persons concerned to the Project, the Terminal Evaluation Team evaluated the Project with the perspective of the five evaluation criteria, and concluded that the Project will successfully accomplish the project purpose by the end of the Project.

RADC has improved analytical and diagnosis technology typically fit for the environment in the Northern Thailand area, and is to be well functioned as agrochemical information center especially for the region.

Based on the findings mentioned above, it is concluded that the Project will complete its activities and will be terminated on November 2006, as planned in R/D.

7. Recommendations and Lessons Learnt

7.1 Recommendations

7.1.1 During the rest of the Project period

Although the Team realized that the Project has been successfully carried out according to the plan, it can be mentioned that the extension activities should be more farmer-oriented in order to achieve the overall goal. The project has been recognizing this fact, as it strengthened the relationship with DOAE to distribute its technology to farmers through FFS. However, due to the limit of the number of the project member and the budget, the Project faces difficulty attending all the FFS to extend their technologies to wider range of farmers in Northern Thailand. It is recommended that the Project should play the roles effective to reach farmers, such as follows.

(1) Trial of TOT method to increase the number of trainers
(2) Release easier documents to be read, such as posters with more pictures, cartoon manuals, etc.
(3) Revisal of webpage such as using easier terms, and creating relationship with public facilities that share PC to the public
(4) Press releasing of articles with impact such as the result of blood test
(5) Organizing opportunities to extend information more to the public

The Project also needs to look at the consumers, as they are the key for the prevalence of the safe agricultural products.

7.1.2 After the completion of the Project

CMU now has the steady relationship with DOAE and the local government for the purpose of extending their technologies through DOAE activities. In order to develop the outputs of the Project, it is suggested that the roadmap should be drawn, making clear the roles of CMU, DOAE and the local government in Northern Thailand. It is recommended that the activities should be agreed by MOAC and adopted to the national level of the agricultural policy.

It is also expected that CMU, the implementing organization, should make continuous efforts not only to maintain the current activities by using its own technologies, human and budgetary resources, but also to challenge to the upper goal.

7.2 Lessons learnt

7.2.1 Practical use of equipments and human resources from previous project

The current Project was designed based on the previous JICA project on Plant Biotechnology, with the equipments and human resources previously developed. The Team found that the equipments were well maintained for a long period and has been used by the current Project, contributing to low investment. The project members also consisted of the former C/Ps, maintaining the relationship with Japanese side and ready to conduct a new project in the beginning of the Project. It can be concluded that this is one of good examples of how the sustainability of a project can contribute to another.

7.2.2 Advantages and disadvantages from absence of long term experts

The Project was carried out without dispatch of long term experts from Japan. As seen in the evaluation results also, it made the Project more efficient in terms of input expenses, but it also caused difficulty in management of the Project including execution of budget offered by Japanese side. The Project turned out fairly well after the short term experts for "project management" had been dispatched quarterly, and this lesson should be shared to similar projects without long term experts.

7.2.3 Importance of extension plans in research oriented project

JICA projects recently have been shifted to field oriented, in order to contribute to issues such as human security and basic human needs. In this situation, though, this Project showed the importance of research oriented project, that develops the foundation of technologies to extend. Research oriented projects usually face the difficulty reaching to the end users. This Project fortunately could form collaboration with DOAE and the local government, and it helped the Project to reach to farmers. A JOCV volunteer also helped the Project to catch a glimpse of the actual situation and needs in the sites around the Project; this case is rare, as a JOCV volunteer cannot be included into a project plan.

Thus, the Team suggests that research oriented projects are necessary for developing the technologies, but extension to the end users must be planned carefully, as well as the research contents for technologies to be extended.

ANNEX 1

ITINERARY PROGRAM FOR EVALUATION TEAM

The Project of Appropriate Technology for Reduction of Agrochemical in Northern Thailand

Date	Activity	
	Mr. Doi, Dr. Kunoh, Mr. Momita	**Mr. Ueno**
Aug. 3, (Thu)	-	- Leave Narita for Bangkok 10:35(JL 717) - Arrive in Bangkok 15:05 (JL 717)
Aug. 4, (Fri)	-	- Courtesy call to TICA - Meeting at JICA Office - Leave Bangkok for Chiang Mai TG 114 (**16:35**) with Dr. Chantaree
Aug. 5, (Sat)	-	- Meeting with Project members of Chiang Mai University and DOAE staffs concerned - Visit Residue Analysis Center
Aug. 6, (Sun)	-	- Check receiving documents form CMU and DOA
Aug. 7, (Mon)	-	- Visit Royal Project (Doi Inthanon) - Visit DOAE Office and/or Technology Transfer Center at Office of Agricultural Extension Mae Rim, Chiang Mai
Aug. 8, (Tue)	-	- Meeting with Project members at JIC-CMU-ATRACT Office
Aug. 9, (Wed)	-	- Visit MCC - Visit Pest Management Center Chiang Mai, DOAE
Aug. 10, (Thu)	- Leave Narita for Bangkok 10:35 (JL 717) - Arrive in Bangkok 15:05 (JL 717)	- Checking receiving documents and prepare some documents - Visit Crucifer Model Farm at Ping Noi, Sarapee District - Visit Crucifer Farm at San Pee Sua, Mae Rim District
Aug. 11, (Fri)	- Meeting at JICA Office - Courtesy call to TICA - Leave Bangkok for Chiang Mai TG 114 - Courtesy call to the president CMU	- Visit Rose Model Farm at Rong Wua Dang, San Khan Paeng District - Visit Rose Model Farm at Pong Yang, Mae Rim District - Checking receiving documents and prepare some documents - Courtesy call to the president CMU
Aug. 12, (Sat)	- Discuss with CMU members and DOAE Chiang Mai at Sukhum Assawet Meeting Room - Visit Residue Analysis and Diagnosis Center (RADC) (Analysis Center, Diagnosis Center, IT Center) - Stay in the hotel (prepare draft of minutes of JCC Meeting)	
Aug. 13, (Sun)	- Stay in hotel (prepare draft of minutes of JCC Meeting)	
Aug. 14, (Mon)	- Visit Tangerine Model and Farm and Farmers' Field School	
Aug. 15, (Tue)	- Final Evaluation Meeting	
Aug. 16, (Wed)	- JCC Meeting and Minutes Signing Ceremony - Visit the "Royal Flora" Horticulture Expo, Chiang Mai	
Agu. 17, (Thu)	- Leave Chiang Mai for Bangkok TG 103 - Visit the Japanese Embassy and report activities - Leave for Narita from Bangkok (JL 718)	
Aug. 18, (Fri)	- Arrive in Narita safely	

Annex 2-1

Project Design Matrix (PDM)
The Project for Appropriate Technology for Reduction of Agrochemical in Northern Thailand

Original Version (Prepared on May 9, 2005)
Version history: No.3.0

Project Duration: 2003.11.13 to 2006.11.12
Researchers assigned in the Residue Analysis & Diagnosis Center

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Overall GOAL Agrochemicals (pesticides and fertilizer) are used in appropriate ways based on precise diagnosis of disease, insect and weed damage at agricultural fields in Northern Thailand.	2000 farmers in Northern Thailand obtain the appropriate technology training provided by the Project's outputs, and 50% of them use the technologies.	DOAE annual report and sampling survey	
PROJECT PURPOSE Analytical technology relevant to agrochemical usage for tangerine, rose and crucifer production is improved, and the function to distribute useful information is strengthened at Residue Analysis and Diagnosis Center (hereinafter referred to as "RADC").	1) 15 kinds of organophosphate and 10 kinds of carbamate which farmers use in the farm can be analyzed with the accuracy of MOAC method *Before the Project, pesticide residue analysis could not be done.*	1) Records on the Project	National policies of the agriculture are sustained. Agricultural market situations are not changed.
	2) RADC diagnoses 21 kinds (3 crops x 7major diseases & insects) of major disease and insect damage in the Northern Thailand. *Before the Project, no regional data to identify diseases and insect, but only general information.*	2) Records on the Project	
	3) The results of residue analysis and diagnosis as well as developed appropriate technologies are offered to farmers through more than 5 kinds of services. (Workshops, Seminars , Websites in internet, Broadcast, Consultation, Farmer Fields School collaborated with DOAE) *Before the Project, CMU could provide 2 kinds of services such as workshops and seminars.*	3) Records of the Project	

OUTPUTS 1) Actual situation of pest and agrochemical usage are grasped at model farms based on objective data and crop season.	1) Record of year-round data of more than 3 kinds of pest, disease and pesticide for tangerine, rose, and crucifer are gathered.	1) Records on the Project	
2) Appropriate ways of agrochemical usage for tangerine, rose, and crucifer production are verified.	2) –1 Guideline for 3 target crops are drafted.. 2)-2 Farmers at model farms decrease the frequency of agrochemical application by 30%.	2) Records on the Project	
3) Information on analytical data of agrochemical residues and on safe and appropriate use of agrochemicals is disseminated.	3)-1 The website is set up 3)-2 The number of seminars/training for the farmers and concerned authorities including DOAE staffs and workshops for counterparts Seminar/Training on agrochemical usage (20 times with total 1,000 participants) 3)-3 30 pieces of manuscript/activities on the appropriate way to use agrochemical (E.g.: Article, Handbook, Handout, Manual, Radio program, TV program, Newspaper etc.) 3)-4 3 demonstration activities at the model farms (rose, crucifers and tangerine) and/or related facilities with the total participating farmers and DOAE staff of 100 persons	3)-1 Records on the Project 3)-2 Records on the Project 3)-3 Records on the Project 3)-4 Records on the Project	

Activities	Inputs	Not be affected by special natural disaster.
1) Survey 1)-1 Review the current data and information concerned 1)-2 Survey the situation on occurrence of disease and insect damages, and weeds in model farms 1)-3 Survey use of agrochemicals in model farms. 2) Ways to use agrochemicals 2)-1 Select target agrochemicals based on the survey results 2)-2 Analyze agrochemical residues in products at RADC 2)-3 Analyze agrochemical residues in farm soil at RADC 2)-4 Test pesticide tolerance of pathogens and insects in the model farms at RADC 2)-5 Improve a simple kits used in Thailand to detect agrochemical residues. 2)-6 Conduct field-tests to establish appropriate ways to use agrochemicals at the model farms. 3) Disseminate of information 3)-1 Demonstrate appropriates usage of agrochemicals to farmers and extension workers at model farms and/or related facilities. 3)-2 Conduct seminars and/or workshops for appropriate usage of agrochemicals. 3)-3 Set up web site to provide information on appropriate usage of agrochemicals.	(By Japan) 1. Short-Term Experts As necessary 2. Provision of following machinery, equipment, and other materials 1) Computer systems. 2) Vehicles 3) Crop cutting tools. 4) Other necessary machinery, equipment, and materials that may be mutually agreed upon. 3. Counterpart training in Japan (By Thailand) 1. Provision of land, buildings and facilities for the Project and project offices, experts' rooms and so on 2. Operational cost 3. Maintenance and repair cost for computers and equipment 4. Assignment of counterparts to each Japanese expert and supporting staff	<<Preconditions>> Model farms cooperate with Project.