SUMMARY REPORT
ON
EX-POST STUDY ON AGRICULTURAL TECHNICAL COOPERATION PROJECTS IN INDONESIA

JANUARY, 1981

JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO, JAPAN

PREFACE

It is with great pleasure that I present this report entitled Summary Report of Ex-Post Study on Agricultural Technical Cooperation Projects in Indonesia to the Government of the Republic of Indonesia.

This report embodies the findings of an ex-post survey which was carried out on such completed projects as Maize Development Project in East Java, Food Production Increase Project in West Java and Tajum Pilot Project in Central Java from 27th of January to 13th of February, 1980 by a Japanese survey team commissioned by the Japan International Cooperation Agency.

The survey team, headed by Mr. Motonaga Ohto, had a series of discussions with the officials concerned of the Government of the Republic of Indonesia and conducted a wide scope of field survey and data analysis.

I sincerely hope that this report will be useful as a basic reference for development of technical cooperation projects between both countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Republic of Indonesia for their close cooperation extended to the Japanese team.

January, 1981

Keisuke Arita

Keisuke Arita
President
Japan International Cooperation Agency

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FOREWORD

As a part of the Ex-post Study on Agricultural Technical Cooperation Projects, our field survey team visited the Republic of Indonesia for 17 days in January-February, 1980.

The main purpose of the Ex-post Study, conducted by Japan International Cooperation Agency(JICA), was to investigate the present situation of the projects, for which JICA had been extending technical cooperation until several years ago, and to examine the after-effects of the cooperation on the agricultural development in the project areas and on the national level; so that the result of the study may be utilized in planning technical cooperation projects in the future.

During the stay in Indonesia, our team visited the agencies concerned of the central government, such as Bureau of Planning and Directorate-General of Food Crops of the Ministry of Agriculture, Directorate-General of Irrigation of the Ministry of Public Work, provincial and local government agencies, government officials and farmers in the project areas.

Field surveys were made on the following three projects for which JICA's technical cooperation was extended during the period mentioned in the respective parenthesis:

(1) Maize Development Project in East Java(1967-74)

(2) Food Production Increase Project in West Java(1969-76)

(3) Tajum Pilot Project in Central Java(1971-76)

In addition, the team visited the integrated agricultural development projects in East Java and West Sumatra, which

were on-going with the cooperation of Taiwan and West Germany respectively.

The findings and observation of our team have been incorporated in the report of the Ex-post Study. The report is written in Japanese for internal use of JICA, but the brief summary is translated hereby into English for submission to the Government of Indonesia which might be interested in our study.

Our team owes great deal to many persons in Indonesia in conducting our study. To all of them we wish to express our heartfelt gratitude.

Motonaga Ohto

Motonaga Ohto

Team Leader

Ex-post Study on Agricultural Technical Cooperation Projects in Indonesia

Members' List of the Team

Ohto, Motonaga	Leader	Special Technical Advisor, JICA, Tokyo
Hirose, Shohei	Agricultural Cooperation	Prof. Faculty of Agr. Short-course College, Nihon University, Kanagawa
Suwa, Ryo	Coordination	Supervisor, Planning and Research Department, JICA, Tokyo
Suetsugu, Isao	Regional Development	Technical Advisor, Association for International Cooperation of Agriculture and Forestry (AICAF), Tokyo
Watanabe, Tetsuo	Agricultural Development	Technical Advisor, AICAF, Tokyo

Schedule in Indonesia

Jan.	27 (Sun)	Manila — Jakarta	
	28 (Mon)	Japanese Embassy, JICA Office Directorate General of Food Crops	
	29 (Tue)	Irrigation Department Planning Bureau	
	30 (Wed)	Jakarta — Chihea, West Java Food Development Project	
	31 (Thu)	"	
Feb.	1 (Fri)	A Team Chihea—Jakarta	B Team Chihea—Tajum, Tajum Irrigation Pilot Project
	2 (Sat)	"	"
	3 (Sun)	Jakarta—Surabaya	Tajum—Bandung
	4 (Mon)	East Java Maize Development Project, CCC Project	Central Java Provincial Govt. Agri. Extension Bureau Bandung—Jakarta
	5 (Tue)	"	"
	6 (Wed)	Surabaya—Jakarta	"
	7 (Thu)	"	"
	8 (Fri)	"	West Sumatra Team Jakarta—Padang —Bukittinggi
	9 (Sat)	"	West German, West Sumatra Agri. Development Project Swiss Irrigation Project
	10 (Sun)	"	Bukittinggi—Padang —Jakarta

Feb. 11	(Mon)	Planning Bureau
12	(Tue)	Directorate General of Food Crops Japanese Embassy, JICA Office
13	(Wed)	Jakarta — Tokyo

CONCLUSION AND SUMMARY

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1. Conclusion

The Government of Indonesia incorporated "Increase in Food Production" as the prime objective in the First 5-Year Economic Development Plan, which started in 1969. The said objective, which had already been provocated in the preceding plans, has been consistently pursued in the following 5-Year plans as well. In recent years, the policy measures for agricultural development have shown a diversification of approach, as is seen in horizontal and vertical integrations of various kinds of development activities or in linking them to regional development. It is perceived, nevertheless, that the increase in food production may still hold the Key position among the objectives of the developemnt in future.

Three projects, on which this survey was conducted, were all oriented to this objective and Japanese technical cooperations were extended in line with this. Namely, East Java Maize Development Project had initially aimed at the increased productivity of export commodity, but its objective was altered during the period of cooperation to cope with the increase production of food.

In this way, the projects, including this one, had responded to the change of policy-needs and to the local requirements as well, with the result that objective of the cooperation being fulfilled. These experiences tell an unquestionable evidence: that agricultural development proj-

ects are requested to set its prime objective at the enlightenment of living standard of farmers; and that they are requested to respond to multifarious changes of policy-needs flexiblly.

Each project has experienced following phases since the cooperation terminated.

(1) East Java Maize Development Project

An early-mature high yielding maize variety(Kretek), a variety improved from indigenous one through the cooperation project activity, has been multiplied as the recommended variety of the Province and been propagated to contribute to the agricultural development in the provincial agriculture. Being supported by these attainments, the project has now grown to the Agricultural Development Center(ADC) of the Province.

(2) West Java Food Development Project

Agricultural Extension Programs of the project were incorporated into the framework of local administration and 90% of the Chihea area came to be covered by the extension activity. The activity is now succeeded by the Middle Level Technician Training Program, based upon resources during the cooperation period.

(3) Tajum Irrigation Pilot Project

This project was succeeded as it had been. The original objectives were almost achieved. Later on, it was expected to be enlarged to an Agricultural Development Center.

As mentioned above, the three projects show different phases of growth, but are understood to have played a very important role in the development policy. Every project still keep functioning now, and it seems that a further contributions to the development are forthcoming.

Purpose of the survey is to identify after-effects of the cooperation. In the sector of agricultural development, however, whether phases of development are accredited to the cooperation project or to other factors are complicated and difficult question to answer, for which much inquiry and analysis are necessary in advance. The team do not pretend the survey was a well prepared and thorough going one. Eventually it could reap results with the help of a purposive and responding attitude shown particularly by the authorities concerned of the Government of Indonesia.

It is noted that these people not only accepted the objective of the survey, but also were aware of the significance that such follow-up actions be placed in a whole cycle of project. It is also appreciated that they were of opinion handed-over projects were to be reviewed periodically and systematically, and that, in fact, they participated themselves in our on-the-spot survey.

Being faced with 1980's, it is urgently requested to promote technical cooperation in a more effective manner so that a considerate approach is taken country by country. It is hoped such a type of survey be duly recognized and be repeated afresh in future.

2. Summary

Out of results drawn from the survey some of the important findings are quoted as follow.

How and to what extent the original plan modified or amended during the cooperation period to cope with changes in the agricultural development policies ?

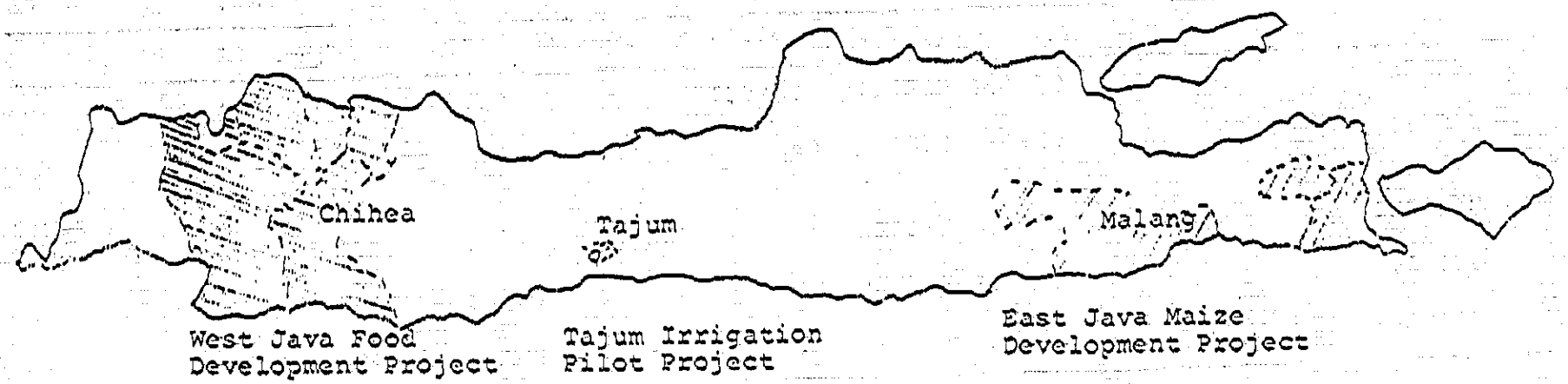
How and to what extent the project pursue changes since the termination of the project up to present ?

What course of development it may follow in the future ?

Outline of Transitory Phases of Agricultural Development Plan and Cooperation Projects

Transitory Phases of Economic Development (Agr. Develop.) Plan	Outline of Projects	East Java Maize Development Project	West Java Food Development Project	Central Java Tajum Irrigation Pilot Project
(Before 1969) In order to increase production of rice, BIMAS Program enforced(Packages of fertilizer, chemical and seed are circulated among farmers together with loan and guidance of rice cultivation techniques).	Name	Maize Project in East Java	Food Increase Project in West Java	Tajum Pilot Project in Central Java
	Period of Cooperation	1967 – 74	1968 – 76	1971 – 76
	I	1967 – 71	1968 – 71	1971 – 74
	II		1971 – 74	-
	Extension	1971 – 74	1974 – 76	1974 – 76
	Progress of Cooperation			
(1969 – 1974) Pelita I. Objective: Increase of food production. Large-scale irrigation development, establishment of BIMAS Program, development of outer islands and exports of agricultural commodities. Export of maize banned in 1971.	Total Cost (Million Yen)	475	352	287
	Experts			
	Man/Month	468	517	220
	No. of Staff	8	10	5
	Machinery Cost (Million Yen)	253	194	142
	Location of Center	Malang	Chihea	Tajum
		Cooperation	Cooperation	Cooperation
(1974 – 1979) Repelita II. Objective: Self-sufficiency of rice, development of agricultural export commodities, agricultural technique extension, increase of productivity, development of outer islands, promotion of INMAS. Impetus to raise living condition of farmers, increase of employment opportunities and economic and social development.	Original Plan	: To increase exports of maize by developing and promoting production of maize (Japan's "develop and import" idea : Covering 5 Kabupaten, cultivation trial, technique extension,quality improvement for export, improvement of storage technique and promotion of crop activities by improving marketing facilities.	: To improve self-sufficiency of food by increase production of rice. :Seed extension training at Bogor Test Farm, Agricultural mechanization training at Skamandi National Farm. Cultivation technique, agricultural mechanization, small-scal land improvement, agricultural coop and seed multiplication.	: To establish a self-sufficing system of food production by increased productivities of rice. :Set up a pilot area to demonstrate methods of productivity increase to 3200 farmers in Tajum Irri. develop. District, provide irrigation facilities(beyond tertiary canal), try application test, extension of cultivation and Irri. techniques, promotion of farmers association to manage water and crop and training of extension workers.
(1979 – 84) Repelita III. Objective: Equity, growth and stability of development. Regional development, development of higher productivity crops, promotion of agricultural product processing(in this plan, more comprehensive and concrete programs than before are proposed)	Amended plan	: To improve farmers' living conditions through Regional Agricultural Development. : Set up a Maize Center at Malang Kabupaten. Establish a multiplication system of improved variety(Kretek). Applied research, extension, farmer leader training, etc. : Integrated into the upland Crop Overall Increase Production Program.	:To improve farmers' living conditions through Regional Agr. Develop. :Set up a pilot farm and a model farm (Chihea farm) in it to cover agr. promotion in Chihea Area(1086ha). Also, set up 16 Demo. Farms and exercise extension and technical guidance by irrigated field preparation, cultivation trial and by group guidance system of farmers(Chihea System).	Not amended (The same practices)
		After Termintion	After Termination	After Termination
	Outline of Activities after Termination of Cooperation	: Based upon the Maize Center, Agricultural Development Center had been evolved to exist. Horticulture crops and rice crop were introduced. Applied research, seed multiplication and training of core technical staff were practiced. :Kretek variety was introduced all over East Java Province. Yield increased(1.5-2.5t/ha). Farmers learned to produce their own seeds. : By attracting maiz oil mill, demand for maiz increased and employment opportunities increased.	:Training of extension techniques had been evolved to Agr. Training Center, Chihea(Japanese technical coop. is going on in the Middle Level Technician Training Program). :Chihea Center cuts its activities but Seed Center functions still. :Owe to Chihea System of extension 90 % extension rate has been reached.	:Project activities are practised consecutively as before. :Two crops of rice in a year in Pilot Area now raise 10t/ha. :Irri. extension activity to 3200ha is expected to be fulfilled by 1983. :Project Center is expected to be upgraded to Tajum District Agr. Develop. Center recently.

Location of Cooperation Projects



Expenses by Year

unit:1000 yen

Item	1967	1968	1969	1970	1971	1972	1973	1974	1975	Total
	A. East Java Maize Development Project									
Surveys	4,924	3,560	3,901	2,837	2,884	1,567	3,488			23,161
Experts	382	19,212	20,203	27,939	35,068	30,971	35,841			169,616
Machine and supplies	-	32,763	21,156	39,883	66,214	72,982	20,000			252,998
Others	-	3,752	4,219	4,198	5,749	5,855	5,589			29,362
Total	5,306	59,287	49,479	74,827	109,915	111,375	64,918			475,137
	B. West Java Food Development Project									
Survey	6,913	-	-	-	-	-	2,983			9,896
Experts	-	13,496	17,209	18,211	23,438	28,766	35,718			136,838
Machine and Supplies	-	91,246	12,159	12,746	22,558	31,877	23,283			193,869
Others	-	245	1,635	1,294	1,961	2,637	3,597			11,369
Total	6,913	104,987	31,003	32,251	47,957	63,280	65,581			351,972

Item	1967	1968	1969	1970	1971	1972	1973	1974	1975	Total
	C. Tajum Irrigation Pilot Project									
Survey			1,723	11,814	-	2,867	3,474	-	5,200	25,078
Experts			-	-	14,618	17,735	16,524	42,938	9,386	101,201
Machine and Supplies			-	-	51,300	30,997	24,000	20,371	15,000	141,668
Others			-	-	1,246	1,046	1,862	4,357	1,647	10,158
Total			1,723	11,814	67,164	52,645	45,860	67,666	31,233	278,105

Note: 1. Surveys include; Preliminary, itinerary and Evaluation.
2. Experts include; Travel cost. In West Java Project, travel cost for itinerant experts.
3. Others includ; Busines expense and contingency in the Center.

I TRANSITIONAL PHASES OF AGRICULTURAL DEVELOPMENT POLICIES AND TRENDS OF COOPERATION

I Transitional Phases of Agricultural Development Policies and Trends of Cooperation

I-1 Transitional Phases of Agricultural Development Policies

As seen from transitional phases of Economic Development Plan I-III, the main objectives and strategies of each plan are summarized as follow.

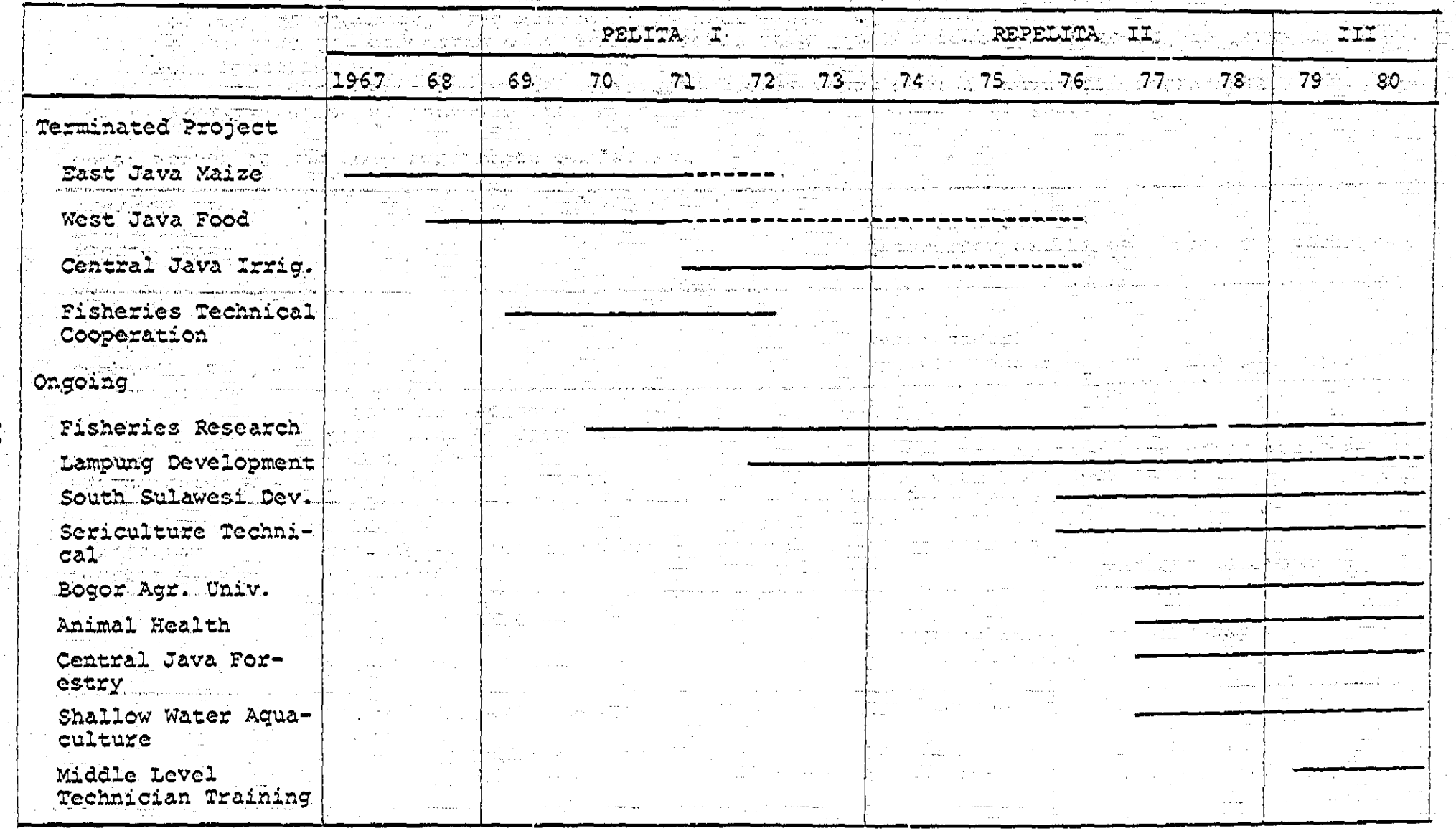
	Main Objective	Strategic Sector
Pelita I	1.Increase production of food 2.Increase production of clothe 3.Strengthen infrastructure 4.Increase of employment opportunity 5.Improvement of spiritual welfare	1.Agriculturure,promotion of BIMAS 2.Manufacture and mining 3.Infrastructure(esp.Agro-based, among others, for irrigation 60% of investiment)
Repelita II	1.Promote farm labor's participation in development activities through increasing agricultural productivities 2.Full self-sufficiency of rice 3.Increase production of agricultural export commodities 4.Increase of employment opportunities in rural area 5.Vitalize potentialities of development	1.Development of outer islands 2.Increase of productivities through extension of techniques to small farmers 3.Improve productivities of over-all agriculture sector and expansion of large-scale irrigation to increase export commodities 4.Strengthen export commodity sector 5.Promotion of INMAS
Repelita III	1.Formulate production plan for suitable agricultural commodities by region	1.Factors of production aspects 1)Development research on rennovated techniques and promotion of

	2.Based upon the above plan,the most adequate utilization of regional resources. Due considerations should be paid to conservation of environment and absorption of labor force	education and extension 2)Development of labor force by accelerating transmigration 3)Smooth supply of production inputs 4)Wider extension of institutional financing 5)Small-scale irrigation(utilization of sub-soil water and dam 2.Marketing aspects 1)Development of market information system 2)Strengthen market research 3)Rationalize market organization 4)Foster processing industries 5)Ameliorate price stabilization policy for rice 3.Institutional aspects 1)Ameliorate social institutions 2)Reorganize administrative framework 3)Strengthen extension system and institution 4)Ameliorate financing system 5)Ameliorate marketing system 6)Foster and strengthen farmer's organizations

1-2 Trends in Japan's Technical Cooperation in Agriculture

Japan's technical cooperation in agricultural sector (project-wise) are viewed vis-a-vis the Development Plans of Indonesian Government. How they are related and to what extent they undergo changes ? Some of the main findings are shown.

Transitional Phases of the Development Plans and Projects



Note: Broken line showes period of elongated agreement.

Relative Position of Projects to Development Plans

Projects	PELITA I	REPELITA II	REPELITA III
East Java Maize	1.Promotion of exports, Increase production of food 2.Promote BIMAS program	1.Regional development 2.Increase self-supply of food 3.Promote INMAS program	1.Integrated regional development
West Java Food	1.Increase production of food 2.Promote BIMAS program	1.Increase self-supply of food 2.Recruit extension personnel	
Central Java Irrigation	1.Irrigation 2.Increase production of food	1.Irrigation 2.Increase production of food	1.Regional development
Agricultural Research	1.Develop agricultural techniques 2.Research on good production increase	1.Develop Agr. techniques 2.Research on food production increase	
Lampung Agr. Development		Research and planning for outer island development	
Middle Level Technician Training		Strengthen extension system and recruitment of manpower	

Observations common to 3 terminated projects:

1) Initially aimed at increase production as well as self-supply of food.
2) For strategic means, research, training, extension and farmer organizing activities were practised
3) At Repelita II objective of activty altered from "food production increase" to "integrated regional development", and strategy, to recruitment of manpower.

II TRANSITIONAL PHASES OF PROJECTS DURING THE COOPERATION PERIOD AND EVALUATION ON THEM

II Transitional Phases of Projects during the Cooperation Period and Evaluation on them

II-1 Transition and Progress of Projects during the Cooperation Period

1) Project formulation -- background scene and affairs

A. East Java Maize Development Project

Although Maize is widely raised all over East Java Province not only for food crop by small farmers but also for cash crop to export, people apprehend production of maize may tend to stagnate. Originally, cropping pattern in East Java is based more on upland crop as compared to rice crop in Central and Western Java. It is gradually recognized that a new policy might take account of relieving small farmers in upland crop area and improving their land utilization.

Such a scene let Indonesian Government go to ask Japan to cooperate in her objective to promote export of maize to Japan and ameliorate her balance of payment. Japanese Government sent a preparatory survey team and execution survey team respectively in March and November 1967. Agreement was reached by both party in December 1967 and the project started in April 1968.

B. West Java Food Development Project

Food production increase program in Indonesia took shape in 1963 as BIMAS program and later in 1965 as Emergent Program for Increase Production of Rice, and the Government put emphasis on these programs as the backlog of political measures.

The situation called for technical cooperation from

Japan to fulfil efficient promotion of these program. Preparatory and execution survey teams were sent in 1966 and 1967 respectively. Agreement was reached in May 1968 and the project set forth in September 1968.

C. Central Java (Tajum) Irrigation Pilot Project

An irrigation work financed by ADB had been completed in 1964 as a component of Five-year Economic Development Plan, Indonesia. ADB recommended a rational utilization of thus developed irrigation water. Accordingly, Government of Indonesia sent Japan a request to extend technical cooperation in enhancing effects of irrigation constructions by designing a pilot area guidance in the construction area. Preparatory survey and execution survey were carried out in October 1969 and February 1970 respectively. Agreement was reached in Feb. 1971 and the project started in September 1971.

2) Alteration of Project Objectives during Cooperation

2)-1 When an agreement period come to be elongated, sub-objectives of the project may often be altered or added to cope with changes in surrounding conditions. Out of three projects surveyed, 2 projects, "East Java Maize" and "West Java Food" altered objective of project itself at the time of agreeing to the second R/D, and sub-objectives or purposes of the project were subsequently reoriented to the modified objectives. These are singular examples never to be seen elsewhere.

Altered Objectives and Reorientation of Subsequent Objectives

	East Java Maize	West Java Food	Central Java Irrig.
Goal 1st. R/D	Improve balance of payment	Increase production of food	Increase production of food
2nd. R/D	Raise level of living	Raise level of living	
Objectives 1st. R/D	Quasi-entrepreneurial maize development	Increase of rice production	Small area agricultural development. Establish irrigation pilot model
2nd. R/D	Regional agricultural development (enhance farmers' economic situation)	Regional agricultural development (extension service and recruitment of manpower	
Sub-objectives 1st. R/D	Research activities Production activities Harvesting and strage activities Marketing avtivities Farmers organizing activities (in production)	Area development program Provincial farm program Private farm program Extension farm program (Seed production and farm machinery training)	Install irrigation facilities. Adaptive trial Extension of techniques Foster water management, society
2nd. R/D	(Reorientation of objectives) Emphasis on techniques development and extension Set up maize center	(Reorientation of Objectives) Develop small model area Introduce extension farm system Propagate Chihea System	
After termination up to present	Enlarged to Agricultural Development Center	Transfered to Agricultural Development Training Center	Succeeding with the same pattern

2)-2 Characters of Projects and their Changes

Characters of projects and their changes during the cooperation period are shown as follow.

	East Java Maize	West Java Food	Central Java Irrigation
Type	Development of a specified crop. Quasi-center-type cooperation	Development of regional rice crop. Quasi-center-type cooperation	Development of Irrigated rice crop. Pilot-type cooperation
Character	Quasi-entrepreneurial development	Production increase	Paddy field arrangement area development
(changes)	Regional development	Extension development	no change
Object area	East Java Province Activities to be enlarged	West Java Province To cover wider area	Pilot area (206.5ha) in Tajum Irrigation Area (3200 ha)
(changes)	Activities contracted but condensed	To cover small area activities condensed	no change
Cooperation period	1967 — 71	1968 — 71 — 74	1971 — 74
Elongation	1971 — 72	1974 — 76	1974 — 76
Alteration of objective	Goal and objective altered In 1972 the project was merged into BIMAS. Objective was abandoned. Only technical guidance still function now.	Objective modified In the 2nd Agreement project objective was modified	no change

3) Prograsses of Project Activities

Progresses of project activities during cooperation period are summarized under those items of sub-objectives which are common to 3 projects, i.e. paddy field arrangement and irrigation works,development of extension techniques, promotion of extension activities and fostering of farmers' organizations.

3)-1 Paddy field arrangement and irrigation works

	West Java Food P.	Central Java Irrigation P.
character	Under the 2nd Agreement, irrigation works and paddy field arrangements were practised in order to employ large-scale machineries in the Pilot Farm	Only terminal irrigation ditches were constructed. No drainage works, no paddy field arrangement works.
Scale	Object area: 100ha	Object area: 220ha Total length of ditches : 9847m
Specification of works	Farm roads Irrigation canals Drainage canals Under drains Water intake Land levelling	Distance between ditches : 300m Over-flow irrigation beyond terminal ditch Run-off 0.2-0.5m/sec Coefficient of roughness : 0.03 Ditch wall gradient : 1:1 Sluice gate: wound by rope Sluice gate construction :maisonry with concrete Water distributing device :stop-log
Management	Through pilot farm	Main canal: Public Works Ministry Terminal ditch :Through Dharma Tirta

3)-2 Development of Extension Techniques

	East Java Maize	West Java Food	Central Java Irrigation
Character -Objectives	1.Breding of highly adaptive varieties 2.Establishing of seed selecting and collecting technique and systematize 3.Improvement of cultivation techniques in general	1.Trials, in order to revise rice crop standard cultivation 2.At the initial phase, emphasis on seed testing and inspection and mechanization training	1.Rice cultivation improvement test at Pilot area
Contents -Items of trial	1.Selection of early maturing and pest and disease resistant line of Kretek 2.Comparative test of varieties 3.Fertilizer application test 4.Cropping sequence and density test 5.Sorgham planting density test	1.Biological characterlistics of varieties 2.Nitrogene fertilizer test 3.Length of nursery 4.Planting density 5.The most appropriate time and method of prevention 6.Consolidation of techniques	1.Planting density 2.Timing of top dressing 3.Amount of fertilizer to be applied 4.Comparative test of chemicals 5.Comparative test of water management 6.Rotation system
Practical techniques	1.For both early and late maturing varieties, either less fertilizer-sparse planting or much fertilizer-dense planting is applicable 2.Planting density 2 plants per hill. Early maturing 80x25cm late maturing 80x40cm 3.Urea: 200kg/ha 4.P application is not neccessary when N is applied much.	BIMAS standard amended 1.Varieties are to be changed according to crop period 2.Increase amount of planting seeds is effective 3.From rectangular to oblong planting 4.Amount and time of N application amended	1.Density: 25x25cm 2.Fertilizer kg/ha Base: Urea 40, TSP 45 Top dress (Urea) I 80, II 80, III 30 3.Frequent occurence of pest and diseases by HYV. Prevention hopeless 4.Intercultivation drying of field, effects uncertain.

Note: At the both East Java Maize and West Java Food Projects, test and trials were not practised until 2nd R/D. Otherwise, more effective progress might have been attained.

3)-3 Promotion of Extension Activities

Extension activities in each of 3 projects are characterized by itself.

East Java Maize Development Project

The Project started with objective to promote entrepreneurial production and payed less attention to extension of techniques. At the later period when the objective shifted from enterprise to regional development, emphasis was laid on extension activities, so that little written record is found on such activities.

West Java Food Development Project

Extension method in this Project was called "Chihea System", and no less influence was felt, it is said, by extension program in Indonesia. The system was initiated by Mr. Sugo, leader, who remodelled demonstration farm prevailed in post-war Japan. Setting up a single extension unit, farmer training and group farming guidance were merged in the unit to let it grow to a larger unit.

Following programs were introduced under this system; set up 16 demonstration farms with 5 ha of field each; Kelompok groups were selected and deployed to each; these formulated a pilot farm, respectively. Further, several Kelompok formed a Himpnan together with a rice mill. Under such organization and activities, farmers' cooperative associations were expected to be formulated.

Central Java (Tajum) Irrigation Pilot Project

The Project took a "small area group cultivation of rice" formation. Within the object area of 220 ha, small practice groups(Kelompok), each with 10 ha field, were

formed. Training and transmit of technical informations were given to a leader of each small group, who might transmit them further to farmers.

Contents of extension activities were, unified varieties, unified transplanting, common nursery, common pests and diseases prevention activities, water management, machine utilization, etc.

3)-4 Fostering of Farmers' Organizations

Patterns of fostering farmers' organization in 3 projects were categorized by two types, i.e. Government-lead type(Coop type) and farmers' self-reliant type(Kelompok type). East Java Maize Project belongs to the former and the other 2, to the latter.

East Java Maize Development Project

The Project started as a model agricultural cooperative in BIMAS Jagung and was expected to grow up to a BUUD. Included in its business were; lend-out loans for seeds and fertilizer; collection, handling and cleaning and drying of commodities for market(export); and hiring out of donated farm machineries, under the guidance of the local Government

West Java Food Development Project

In its extension program-oriented fostering of farmers' organization, the Center had experienced following two phases.

(1) At the terminal unit(demonstration farm) i.e. Kelompoks, rice cultivation learning groups, were formulated as the objective of group guidance of extension activities.

(2) Then, Himpunans were formulated by merging several Kelompoks; they installed rice mill to process their own white rice; and a gist of project, once exploited by middlemen, was recovered by farmers. Himpunan was a self-reliant rice milling group and was originated by the establishment of demonstration farms.

Central Java Irrigation Pilot Project

In this project organization of farmer group had two phases.

(1) Establishing of water management Dharma Tirta.

It started in 1972 as a water management unit, and later was transformed to a rice group-farming group.

(2) Fostering of rice practice group, Kelompok.

220 ha of pilot area was divided into each 10 ha unit. Kelompok was formulated in each one. A leader of each unit was given training to accelerate organizational activities.

When these organizations advanced to form Dharma Tirtas they were expected to constitute affiliate organizations of farmers' cooperative association.

4) Problems to be solved at the termination of the cooperation

Problems to be solved include not only those which could not attain the target assigned to the project period, but also those which were retarded as against the target of development. They are investigated by project level and grass-roots level.

4)-1 Project Level

	East Java Maize	West Java Food	Central Java Irrigation
Field arrangament and Soil Improvement	not applicable	1.Facilities for surface water drainage 2.Coordination of time and place of water management for group cultivation 3.Soil improvement by intercultivation drying of field, draining of water at harvesting period and application of organic matters	1.Around 10% of fields were non-irrigable.Equitable distribution of water needed
Trial and Demonstration	1.Characteristics of improved variety "Kretek" be maintained 2.Development of suitable technique for region 3.Stabilization of maize crop	1.Improvement of pests and diseases prevention techniques 2.Rational use of irrigation water 3.Improvement of cultivation techniques	1.To determine adequate time to spray 2.Water management techniques 3.Promotion of inter and/or multiple crop for 2nd crop
Education and training	1.Strengthening of teaching staff 2.Replenishing of teaching materials 3.Intensification of core farmer training	1.Replenish teaching staff in quality and quantity 2.Replenish teaching materials 3.Strengthening of core farmer training	1.Extend farmer training to non-pilot area 2.Replenish teaching materials
Extension Activities	1.Promotion of BIMAS and/or INMAS activities 2.Closer linkage between research and extension	1.Switch from Chihea system to BIMAS and/or INMAS	1.Extend activities to non-pilot area 2.Closer cooperation with RDC

	East Java Maize	West Java Food	Central Java Irrigation
Production Plan	1.To secure seed production target	1.Countermeasure to unstable crop 2.Production increase measures	1.Yield target 10t/ha be achieved as soon as possible
Farm Machinery Utilization	1.Effective use of unused and abandoned machines and supplies. 2.Device system to maintain and up-keep donated machines and supplies. 3.Improve capacity to repair defective machines and secure supply line of spare-parts. 4.To make introduction of machine feasible, improve and rearrange soil condition of the field. Drainage facilities should be completed to drain surface water and sub-soil water. 5.Future course of development might be described as follows; Development of locally well-suited machines;and promotion of indigenous manufacture of these and other models[1], for instance, ploughs for animal draught, improved pedal-thresher, sprayer, etc; Tillers, in particular, should be a lighter-type one so that it might be adapted to soft and damp soil.		

Note: 1) Soedjathiko:Development of Agricultural Machinery and their Link to Small Metal Industries, 1978

4)-2 Grass-roots Level

	East Java Maize	West Java Food	Central Java Irrigation
Increase Production and Increase Income	1.Increase production of dry land crops other than maize 2.Cheaper price payed by farmers(esp.fertilizers)	1.Cheaper price payed by farmers(fertilizers too expensive) 2.Too cheap rice price for farmers 3.Stabilization of crops	1.Target yields should be attained by all farmers in the Pilot area
Technique Transfer	1.Closer contact of extension work with farmers 2.Promote group guidance	1.Closer contact of extension work with farmers 2.Intensify establishment of demonstration farm	1.Thorough diffusion of extension techniques(as already noted)
Activities of Extension Workers	1.Strengthen extension workers in quality and quantity 2.Provide more motor-bicycle 3.Strengthen RDC		1.To attain target of each practice in cooperative work(as already noted)
Fostering of Farmers' Organization	1.Promote and strengthen organization of terminal group employing core farmers as a key 2.Foster and promote KUD and/or BUUD		1.In the Pilot area terminal production units were organized, but activities of water management association are ineffective

II-2 Changing Phases after the Termination and the Present Situation

How and to what extent the Terminated 3 projects had experienced changes and what direction they may take in future ? Descriptions on these situations are, indeed, highlights of the survey, focal points of which being summarized as follow by project-wise.

East Java Maize Development Project

1) New name

BIMAS/INMAS Agricultural Development Center(ADC)

2) Phases in transition

At the extension of the Agreement, Maize Center was set up. Its substance was Palawidja Center to cover all dry field crops. In June, 1978, it was reorganized as ADC and its assignment covered rice and horicultural crops. It is now involved in Regional Development Project.

3) Progress after the transference

BIMAS/INMAS benefitial area was enlarged and facilities already established in each locality were merged and consolidated. Facilities of old Maize Center at Kedali were enlarged and up-graded as the Headquarter. Maize area covered also increased considerablly.

4) Character, target and/or objective of the Project were, as shown by the name, like those of Prefectural Agricultural Research Station being supported by a training institute in Japan. The ADC, as a bridge to fill gaps between research and extension, intends to develop and diffuse techniques which are suited to the local conditions

and to increase and stabilize crop production.

5) Organization and constituent of project body. ADC consisted of, under the supervision of Director, Provincial Agriculture Department, a Director, 9 sections and 8 branches/trial unit and seed production farms in the Province. Number of staff numbered 244 including university graduates 18, junior college graduates 13, high school graduates 24 and others 189. Newly established buildings were; experiment laboratory, library, trainee hostel, staff residence, guest house, supply store, seed store, etc. Total expenditures were disbursed by the provincial government and foreign aid fund was not received.

6) Activities at ADC

Field trial: On varieties, fertilizers, multiple cropping, cultivation, pests and deseases, weather and mechanization.

Education and training; for technical personnel under jurisdiction and for middle level technical personnel under the nation-wide recruitment plan.

Extension: After transferred to ADC, extension activities were limited to information, training and supply of seed.

Seed production and distribution: Seed production activities were enlarged to cover various crops, and 8 seed farms were established in each of 5 regional divisions.

Machine hiring service: Hiring services were continuously performed for useful machines and implements.

Note: 1. The Middle Level Agricultural Technician Training

Project was formulated to promote BIMAS/INMAS program. There were 19 recruitment centers in all Indonesia. Out of them 2 centers started under the cooperation of Japan in 1979.

West Java Food Development Project

1) New name

Seed Center Chihea

2) Phases in transition

Before the cooperation period it was called Seed Prodiction Center. After the termination it was renamed as above. Project activities, however, continued up to 1977. Activities other than those practised on the Government Farm(250 ha) were transfered to institutions concerned.

3) Progress after the transference

Activities were limited to management of Government farm, seed production and training. Owe to this curtailment staff officers were transfered and activities in the Center toned down.

4) Character, target and objective:

It was a seed production farm with training-type.

Objectives were:

Identification of rice production technique through production and distribution of improved seed; Providing young generations and to-be-leaders in villages practical knowledge of agriculture.

5) Project body:

It consisted of a farm manager and other staff and

three sections. Facilities of 250 ha farm and for processing and testing were same as seen at the termination. Staff which numbered 157 in 1974 (university graduates 12 and others 145) decreased to 120(university graduates 4 and others 116), higher-rank staff having been decreased.

6) Activities

Field trial:

Activities continued till 1977 in a smaller scale, but suspended since 1978.

Education and Training:

Training was performed till 1977 for farmers (1700) on 1068 ha. Since then a practical training has been performed for students of agricultural high school and agricultural college and also for research assistants.

Extension activities:

Activities covered farmers in the Government farm only.

Seed production and distribution:

Production of paddy seeds continued in two crops in a year. Inspected seeds were distrubuted attached with certificate.

Machine hiring service:

Owing to frequent disorder service was suspended in 1976.

Fostering of farmers' associations:

It was promoted only in Government farm 250 ha.

Central Java Irrigation Pilot Project

1) New name

Agricultural Development Center(ADC) or Center of Agricultural Technology(CAT).(likely to be changed in 1980 or 1981)

2) Phases in transition

As of February 1980, the old project was still functioning. Under the approval of the Minister, a concrete transference plan to ADC or CAT was being drafted at the Central Government and at Central Agriculture Reaearch Institute.

3) Progress after the transference

Staff, facilities and activities were left and continued as before. The target of yield by 2 crops in a year was fulfilled in 3-4 years after transfer, and the objective of the pilot Project was seemed to be performed.

4) Character, target and/or objective

The present irrigated paddy Pilot Farm was expected to be transfered to a project of ADC-type in East Java but in a smaller scale. Target for Pilot area at the termination was to attain 10t/ha of paddy in an earlier date, but it was accelerated to attain the same level of yield on the same irrigation area of 3,200 ha.

5) Project body

The body of the project was same with that at the termination of the project. In a future plan, it will be transfered to ADC with expanded facilities, i.e. four business sections under the Director, 10 ha trial field and added construction of assembly hall, lecture room, experiment laboratory, library, trainee hostel and staff residence.

6) Activities

Field trials: on variety, fertilizer, crop protection and cultivation techniques.

Training: for key farmers was suspended in 1977, but group guidance was performed in emergent occasions. Training facility was used for various training puroses.

Extension: continued at Pilot area for 220 ha.

Seed production and distribution: Activities were excluded from the assignment. In future, however, field shall be enlarged to 7 ha.

Machine hiring service: was continuing, but training for operators for the purpose of preventing mishaps was emphasized.

Fostering of farmers' organizations: performed for farmers in Pilot area, 220ha.

II-3 Evaluation at the time of the termination and that at the survey—their comparison

Aanlysis was made by comparing findings: one from the evaluation report written at the time of the termination of the project, and the other from results of the survey.

Results were summerized under the following headings: overall appraisal, rates of attainment to target and appraisal by phases (project level and grass-root level) for each 3 projects.

East Java Maize Developmnt Project/ADC

	At the Termination	At the Survey
Overall Appraisal	Project objective was modified in-between, so the Project failed to meet the initial objective. But, for the later period attainment for the revised objectives esp. that for the sub-objective, deserved a high estimation. Lessons learned from this specialized project were significant. The way in which project objective was formulated and sub-objectives introduced was rigorously criticized.	Revised objective was pursued till 1977. Since 1978, under ADC program, facilities, organization and staff were enlarged and activities replenished. Facilities at the cooperation period were utilized as the core for the new Center to be formulated as an agricultural technique development center, thus showing an example of objective-transfered-but-developing-type of project.
Rate of Attainment to Target	1. Exports: In teums of desa involved 60%. In terms of volume delivered 37%. 2. Area covered by Project Max. per annum 61.1 %, Min. per annum 39,8%. 3. Production and extension of improved variety to planned area, around 50%. 4. Participation to BIMAS Palawidja minimal.	1. Even after removal of ban exports were minimal. 2. Provincial rate of attainment of BIMAS/ INMAS target 1977/78 114%. 3. Improved variety was circulated to entire area of Province 1,110, 000 ha:420,000ha. 4. Transit from BIMAS to INMAS advanced in the last 2 years.
Apprisal by Phases		
Project level	1. Kretek was bred. 2. Seed production system was established. 3. Production and post-harvest techniques were introduced. 4. Effective use of machines was introduced. 5. Machines were utilized effectively.	1. Result of Kretek breeding extended to a wider area. 2. Progress of seed production system and extensive use of Kretek were assumed as en effect of the cooperation and were highly appraised. 3. Seeds produced under the program amounted to 1,200 t in 1979/80.

Grass-root level	1. Farmers' awareness was improved. 2. Yields increased distinctively 0.94-2.8t/ha. 3. By using donated machienes and supplies productivity was improved. 4. Benefits by farmers' organization were increasingly acknowledged.	1. Farmers' preference to higher yield was improved epochally by Kretek. 2. Yield and production increased further Yield 1974 78 Index (kg/ha) 748 1038 138 Production 8930 12960 148 (1000t) 3. Machines were used still effectively. 4. Participation transferred from BIMAS to INMAS and increased.

West Java Food Development Project/Seed Center, Chihea

	At the Termination	At the Survey
Overall Appraisal	The course of development was reoriented from the initial one, which aimed at a leap forward on the basis of weak infrastructure, to that which adjusted to the local condition. In accordance with this change, emphasis in the sub-objective was also shifted. Such a type of adjustment by reorientation of course and by shift of emphasis deserved a high estimation. This was a model of "objective reoriented-type" technical extension cooperation project.	Out of 4 sub-projects 3 were transferred to the general administration channel as Chihea Seed Center, whose emphasis was laid on seed production and training. Its jurisdiction was also transferred from State to Province and budget, personnel and activities decreased. This was a model of "development shifted-type" project. Activities in Chihea Center itself after the transference was not so highly evaluated.
Rate of Attainment to Target	1. Targets were attained in production, inspection and distrubution of improved seed. 2. Increased yield in object area: 24% in 5 years. 3. Diffusion rate of new varieties 60-70%. 4. Fertilizer application 100%.	1. In seed production target was attained every year, but crop was unstable, non-inspection seeds amount to nearly 50%. 2. By 1979 yield increased further by 16% (in ten year total, 40 % increase) 3. Diffusion rate of new varieties 70-90% (1979)

	5. Crop protection practice 50%.	4. Fertilizer application 100%. 5. Crop protection practice 45%.
Appraisal by Phases		
Project level	1. Training for key farmers and technical personnel was effective. 2. Strengthened BIMAS by improving cultivation standard. 3. By initiating and developing Chihea System, provide technical administration with impetus.	1. Training for high-school students and univ. research assistant was effective. 2. Confirmed effects of K application and introduced it in extension activity. 3. Machine hire-out for farmers was suspended. Maintenance and up-keep were not deemed agreeable.
Grass-root level	1. Group farming by farmer was promoted. 2. Increase of yield 24 % in Chihea area. 3. New varieties, fertilizer application and crop protection techniques were propagated. 4. Weeder and sickle harvesting were increasingly used.	1. Changes in farmers' organization after the termination were not clear. 2. Increase of yield after the termination, 16 %(1979), but crop was unstable. 3. Planting density was improved from 30x30cm to 25x25cm. 4. Farmers' living standard was improved mainly by non-agricultural income.

Central Java Irrigation Pilot Project

	At the Termination	At the Survey
Overall Appraisal	As a model of pilot project high estimations were given to expert's several partial activities. Significance of the project lay in its unsolved questions out of which many lessons might be quoted. So the overall appraisal was not good.	After the termination, the same staff, budget and scale of activities were maintained. But by the efforts of manager and staff, pilot objectives were almost fully performed(in 8 years since its start). It is scheduled ADC/CAT be set up by modifying and enlarging its objectives to cope with func-

		tions of a regional center. This is an example of projects where hand-over activities were continued as it were and won a high estimation.
Rate of Attainment to Target	1. Rate of attainment to yield target in irrigated 2 crops of rice (10 t/ha) by unit area sample : 100% in anquete survey on farm : 70% 2. Termianl distribution of irrigation water:90% 3. Inter crop soybean : 0% owe to miss-culculation at the planning stage and to the plan in which drainage was neglected.	1. Target 10t/ha was surpassed in Pilot area in 1978, and crops were comparatively stabilized. 2. Terminal distribution of irri. water : 95%. 3. Inter-crop soybean was abandoned.
Appraisal by Phases		
Project level	1. Intensive training for key farmers. 2. Completion of irri. works(several faults in design). 3. Standard cultivation techniques were improved through application trials. 4. Efficient use of machines	1. Key farmers increased, need to intensify training further. 2. Paddy field not fully supplied with water decreased from 10% to 5% by inventions of farmers themselves. 3. Application trials continued to contribute. 4. Repair and maintenance of machines were excellent. Efficient use continued.
Grass-root level	1. Group guidance led by key farmer attained success. 2. Epochal increase of production and income were reached by 2 crops in a year. 3. It was recognized that an improved living standard of farmers was attributed to the irri. project.	1. Group cultivation units increased. Group farming was promoted and attained further success. 2. Yield exceeded 10t/ha in Pilot area, and 8.8t /ha was reached in neighboring area. Crops stabilized. 3. A higher living standard was attained.

III COURSE OF DEVELOPMENT AND PROBLEMS ENCOUNTERED

III Course of Development and Problems encountered

What course of development these 3 projects preferred and with what kind of problems they faced ?

These are summarized by each project.

East Java Maize Development Project

1. Course of Development

In the 7th year after the termination of the cooperation (and in the 5th year after the termination of the follow-up), the project was absorbed in ADC project. Thus, the objective was shifted toward development, under a new regional agriculture development center(ADC).

2. Problems encountered (Overall Problems)

1) Integrated dry land agriculture development

Promotion of integrated development in Pedjon Area, Malang District. Soil conservation being the Key measure, animal husbandry in slope forest, fruit and vegetable cultivation are to be integrated.

2) Maintain varietal characteristics of Kretek

Prevention of deterioration and rennovation are neccesary.

3) Rennovation of machines and replenish of spare-parts

4) Stabilized yield-increasing techniques for dry land crops, i.e. varieties, seed production, fertilizer application, etc.

5) Multiple cropping techniques and improvement of farming system.

6) Droughts, pests and diseases counter-measures.

7) Prompt ploughing immediately after the onset of the rainy season

West Java Food Development Project

1. Course of Development

In 1977, three years after the termination of the cooperation, and the next year when the follow-up cooperation terminated, 4 sub-projects started: i.e. area development program, Provincial Farm, private farm and extension farm. Provincial Farm (250ha) was handed over to the Chihea Center, and the other 3 sub-projects were transferred to the provincial organizations. The recruitment and training activities for extension manpower, which were initiated by Chihea Center, were employed in the nation-wide training plan. In 1979, Chihea Middle Level Technician Training Center was established in the adjacent area as a "center cooperation" project by JICA.

In view of these progress, the course of development in this project was directed to training of technical person and leader-farmers and to seed production farm.

2. Problems encountered

(Overall Problems)

1) Paddy drying in the rainy season: more economical and practical dryers are needed.

2) Costs by electric power-driven dryers are 8 times of those by heavy oil.

3) So many mishaps in machines. Life of tillers is short.

4) Maintenance of machines should be improved.

(Technical Problems)

1) Operation cost of paddy dryer should be decreased.

2) Prevention of red-rot damage in wet paddyfield. Count-

er-measures for damages by rain, pests and diseases in the later growth stage.

3) Prevention of rodent damage in the terraced paddy-fields.

4) Improvement of machine repairing techniques.

Central Java Irrigation Pilot Project

1. Course of Development

The activities of the project were succeeded without change even after the termination of the project. Initial objective and target were fulfilled and the objective, activities and facilities are to be changed and enlarged for a new ADC regional center in 1980/81. The course of development is thus directed toward ADC project.

2. Problems encountered

(Overall Problems)

1) In the present project activities, shortcomings are felt in supplies of spare-parts and sundry goods for recording meteorological observation.

2) In future, in an anticipation transfer to ADC being materialized, improving of quality of staff and replenishing of teaching materials, test and trial supplies and extension aids are necessary.

(Technical Problems)

1) Scarce water and fertilizer counter-measure techniques.

2) Opportune time prevention techniques for insect and rodent damages.

3) Prevention of fertilizer loss in overflow irrigation fields.

4) Paddy field multiple cropping techniques

5) Appropriate techniques for water management.

JICA