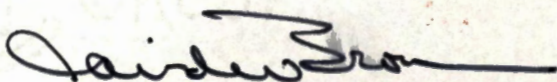


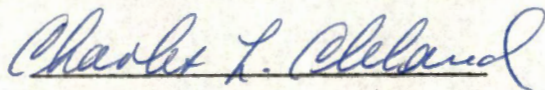
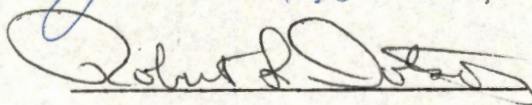
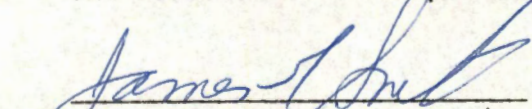
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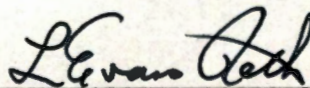


David W. Brown, Major Professor

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AGRICULTURAL DEVELOPMENT IMPLEMENTATION--
THE KEMUBU RICE PROJECT IN MALAYSIA

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Nik Hassani Mohamed
March 1979

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ABSTRACT

This dissertation looked into agricultural development with emphasis on the project approach. The Kemubu rice project in Northeast Malaysia was used as an illustrative situation to examine success and failure elements in effective project implementation. The Kemubu project is a World Bank sponsored project which is making irrigation, multiple cropping of rice, and improved practices available to 45,000 small farmers. Special attention was drawn to project management environment and its links with other agencies at both the national and local levels. Specific aspects examined included: the management organizational structure and operating style, use of Farmers Associations (FAs) as a vehicle for involving farmers and making new services available to them, effects of national rice policies on project performance, and resulting changes in rice production, farmers' income, and rural employment.

The data for the study were obtained from published reports produced by the Project Authority (KADA), other studies related to Kemubu and personal experience of the author, who served as Agricultural Division head of the project from 1970 to 1975. Studies on agricultural project development and implementation by others in the Less Developing Countries (LDCs) form the basic framework to conceptualize the setting of the Kemubu experience. "Before" and "after" situation budgets were developed to monitor and evaluate what lessons can be learned from the project from three viewpoints: (1) the farmer, (2) the management and (3) the national development perspective.

The study revealed that by 1976 Kemubu had contributed output gains in rice production in Malaysia. However, the broader impacts generated from the project were far from satisfactory. Farm incomes have not increased relative to the national average. This stems in part from the large number of project farmers who are tenants; they have to pay for all the crop inputs but retain only half the rice production. Small farm size is another significant limiting factor to higher farm income. However, as an outgrowth of the spread of rice double cropping practices, the seasonal pattern of labor utilization on project farms has undergone changes and farm employment opportunities have improved. In terms of project organization and management, the Kemubu experience has shown that linkages with supporting agencies were not the best. A major reason was that some administrators were accustomed to rather rigid, top-down administrative styles.

The conclusions of this study were:

1. Failure to use rice varieties and fertilizer recommendations adapted to local conditions have limited paddy yield increase to about 82 percent of estimated potentials.
2. Future farm expansion in Kemubu is limited unless substantial numbers of farmers now working on uneconomic farm holdings can be resettled onto new land.
3. Working with farmers in small groups within communities (the Small Agricultural Units) and using the Farmers Association model has been more successful than the traditional approach of working through village headmen.

On a broader basis, two additional inferences can be drawn:

1. National policy goals of making cheaper rice available through price controls and imports have been inconsistent with project aims of generating more rice production and higher farm income.

2. Lack of data make it difficult to observe the performance of the Kemubu programs thus far. This implies need for a monitoring system to facilitate data collection on a continuing basis when a project is first implemented.

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GLOSSARY

ABM	Agricultural Bank Malaysia
DID	Drainage and Irrigation Department
DOA	Department of Agriculture
FA	Farmers Association
FDC	Farm Development Centre
FOA	Farmers Organization Authority
Gantang	One gantang of paddy is equal to 6 pounds
GMP	Guaranteed Minimum Price
IBRD	International Bank for Reconstruction and Development
IRRI	International Rice Research Institute
KADA	Kemubu Agricultural Development Authority
Kampung	A Malaysian word for village
Kemubu	The Kemubu project includes the entire area of the following irrigation schemes: Kemubu, Pasir Mas, Lemal and Salor. An Authority was formed in 1973, The Kemubu Agricultural Development Authority (KADA), to manage and implement multiple cropping in KADA. Unless otherwise specified, "Kemubu" refers to the whole KADA area.
LDC	Less Developed Country
MADA	Muda Agricultural Development Authority, an earlier World Bank financed rice project in Malaysia
MARDI	Malaysian Agricultural Research and Development Institute

NPRB	National Paddy and Rice Board
Penghulu	A Malaysian word for village headmen
Pikol	One pikol is equal to one-sixteenth of a ton
PIM	Programming and Implementation Management System
SAU	Small Agricultural Unit

CHAPTER I

INTRODUCTION

A. THE IMPORTANCE OF PROJECTS IN DEVELOPMENT

Projects have evolved in the Less Developed Countries (LDCs) as a direct result of one or more socio-economic and political phenomena. They have stemmed from the national political goals of consolidating solidarity--i.e., building legitimacy or fulfilling the needed stability for the incumbent ruling elite. Investment projects by governments have been used as a measure of national progress, economic development and modernization.¹ As part of strategies for social and economic changes, projects have provided the LDCs the means of mobilizing resources and allocating them to the production of goods and services--enhanced food production and creating new jobs. The World Bank and other development agencies involved in the economic development of the LDCs have regarded projects as the "building blocks of development."

Many LDCs have been engaged in project development during the last two decades. However, there have been serious problems related to project management and implementation. A major limitation--perhaps more than financial constraints--has been administrative capacity. The conventional focus of administrative personnel in the LDCs has been mostly confined to regulatory procedures rather than being developmental and change oriented.

¹Dennis A. Rondinelli, "Project Identification in Economic Development," in Dennis A. Rondinelli, *Planning Development Projects* (The Maxwell School, Syracuse University) (Philadelphia: Dowden, Hutchinson and Ross Inc., 1977), pp. 69-94.

In short, we could argue that, once projects were identified, the implementation phase often lacked adequate organization and management for such projects to carry out the activities during the output generation period--output production and distribution.

B. THE PROBLEM OF EFFECTIVE PROJECT IMPLEMENTATION

In theory the development of projects for small farmers has revolved around what Kulp² has referred to as the interplay between innovations and institutions:

Innovations increase a peasant's income and his ability to assimilate further innovations. Yet unless there are institutions to support innovations, farmers cannot adopt them. Reciprocally, institutions require innovations to catalyze their own development.

In a similar manner, Mosher³ has defined 10 essentials and accelerators for agricultural development.

The success or failure of projects during the implementation phase has revolved around the management organizational structure and the stated objectives that projects were put together to accomplish.

Experiences in project development in the LDCs have shown three problems which could determine success or failure during the output generation phase of projects. These problems are:

- 1.. Is the top-down approach to management appropriate?

²Earl M. Kulp, *Designing and Managing Basic Agricultural Programs* (Bloomington, Indiana: PASITAM Publications, 1977), p. 13.

³A. Mosher, *Getting Agriculture Moving* (New York: ADC Publications, 1966). The five essentials are: new technology, markets, supplies, transportation and incentives; the five accelerators are: extension, production credit, group action, land development and project planning.

2. Is the project organization flexible enough to be effective?
3. Is the project having the intended effects on target groups, such as small farmers?

Is the Top-down Approach to Project Management Appropriate?

Experiences in the LDCs have shown that frequent uses of top-down approaches to project development have given rise to serious issues of project management.

Chambers' observations on projects in Kenya illustrate the weakness of the top-down approach to project administration.⁴ The projects reviewed by Chambers used what was called "Programming and Implementation Management System" (PIM). The system basically involved three characteristics:

1. A programming exercise, where work programs would be drawn up.
2. A management meeting, where works that have been implemented would be reviewed.
3. An action report of works accomplished and problems encountered.

According to Chambers, the main defects of the system in the Kenyan experience were in the following areas:⁵

1. The top-down targetary was unrealistic.
2. There were very little feedback on project staff activities.
3. There was no standard reporting procedure.

Above all the Kenyan projects missed the management philosophy within the PIM system--the needs of local farmers--local farmers were never brought into the management organization.

⁴Robert Chambers, *Managing Rural Development*. (Uppsala: The Scandinavian Institute of African Studies, 1974), p. 43.

⁵Ibid., p. 67.

The PIM system was very innovative within the context of the Kenyan project implementation strategy. But it failed because of the relative underdevelopment of management expertise.

Kenyan projects achieved only limited success because the management philosophy embodied in PIM was not fully appreciated by the Kenyan hierarchy at the national level. It was implemented as a pilot project to test its replicability all over Kenya in project management administration.⁶

Is the Project Organization Flexible Enough to be Effective?

Many times management organization at the project level lacks flexibility to make adjustments to changing or unexpected situations. The success and failure of projects has often reflected inadequate project management organization and the lack of linkages with its environment. Project environmental linkages are the links between the project management authority and other institutions (such as agricultural banks, farmers associations and marketing boards) that have programs which fit into the activities of the project. These linkages have been referred to by one management consultant as:⁷

. . . a common feature in the execution of development projects is the lack of a project management organization to integrate and coordinate project management process . . . development projects are often administered through the transfer

⁶Uma Lele, *The Design of Rural Development--Lessons From Africa* (Baltimore: The Johns Hopkins University Press, 1975), pp. 187-188.

⁷Raymond Radosevich, "Management of the Project Environment," Graduate School of Management, Vanderbilt University, for U. S. Agency for International Development (Washington D. C.: U.S.D.A., 1974, distributed by Development Project Management Centre).

of responsibilities and functions between individuals and organizations . . . there is a lack of commitment to the process as a whole, individual and institutions are concerned only with specialized fragments of the project, resulting in loss of direction, confusion, and dilution of efforts in achievement of project management objectives.

According to Esman,⁸ recognition by project managers of external environmental links could be vital:

They must focus on their external relations. Their relevant environment is not an undifferentiated mass, but rather a set of structures and sometimes individuals which control certain values have certain interests of their own and with which the change oriented institution must attempt to establish and maintain compatible relations.

A project manager should consider the complexity and importance of managing the interactions between the project management and its external linkages. Within any country the project management organization should fit into the implementation framework for the whole network or programs for meeting key economic and national objectives. In short, no project management organization should function in isolation.

A successful project management entity at the operational level should function with the following components and the organizational framework should have:⁹

1. Legal sanctions.
2. Delegation of responsibilities at operational levels.
3. Innovativeness and ability to accommodate needed changes to meet new circumstances.

⁸Milton J. Esman, *Administration and Development in Malaysia* (Ithaca: Cornell University Press, 1972), p. 178.

⁹David W. Brown, *Planning Agricultural Projects for Successful Implementation*, USDA/AID Training Manual (March 1977).

4. Ready access to a variety of inputs and services from both the public sector agencies and the private sector, such as input supply firms.

5. A project management structure which has evolved from the existing line agencies, or created as a specialized project agency, that is adaptable to development needs.

Above all, the project management organization should be guided largely by the program ideology and the intent of the project. It should be organized around activities and services that have relatively well-defined technologies and objectives. For example, the implementation of an irrigation project so as to facilitate multiple cropping.

The lack of attention to project management organization has seemed to be a basic weakness in almost all the LDC development projects. Most governments in the LDCs have been biased toward a highly centralized structure of authority and administration.¹⁰

Therefore, several structural arrangements of project management entity could be considered:

1. The creation of an autonomous project entity.
2. The creation of a new division within an existing agency to spearhead the project.
3. The creation of a new rural institution that would directly benefit from the implementation of the project.

¹⁰ Norman T. Uphoff and Milton J. Esman, "Local Organization for Rural Development in Asia," in *Development Digest*, Vol. XIII, #3 (July 1975), pp. 31-46.

In addition, there are several other issues on project organization that need to be considered:

1. The extent to decentralize authority.
2. Ways to obtain services not available within the project organization.
3. Relationships with other ongoing programs that have a bearing on the project.
4. Farmers' participation in vital project functions that affects them directly.

Is the Project Having the Intended Effects on Target Groups?

Agricultural projects in the LDCs sometimes have not reached or have intended effects on project clientele. Most projects have been conceived as components of the national economic development plans. The national governments have used projects as a vehicle to broaden political participation, to build political patronage and to realize ideological objectives. But effects on incentives and wellbeing of small farmers or other target groups have not always been taken into account.

Lele¹¹ in her intensive study of project organization and management in Africa observed that project administrators have the difficult task of reconciling the need for growth, the need to broaden participation and the need for a project management strategy which is administratively feasible.

¹¹Uma Lele, op. cit., p. 142.

This typology of project implementation has stemmed from the shortage of qualified personnel, as well as over-concentration of expertise at the centre and hence weakening administrative capacities at the project level. One upshot has been lack of identity of the national government with the large segments of farmers in the project. The growth of this kind of project management administration has come about as a result of the lack of concern for the kinds of help that farmers need most.

Koteen¹² has identified the weakness of project organization at the local level as "the problem of local capacity for local action." He mentioned several weaknesses that cause the lack of local participation in project management:

1. Lack of planning capacity at regional levels.
2. Lack of Managerial capacity at local level.
3. Absence of partnership between central and local authorities.

Government services from different ministries in the same project area might be consolidated and coordinated at project level closer to farmers to provide a stronger nucleus for local action and participation. Local participation could provide a vehicle and means for client influence on management of projects. An empirical study reported by Morss of 36 projects in Africa and Latin American countries has provided further insight in the significance of local participation in enhancing project

¹²J. Koteen, "Key Development in Development Administration," in Kenneth J. Rothwell, *Administrative Issues in Developing Economies* (Lexington, Mass.: Lexington Books, 1972), pp. 47-67.

impacts on small farmers.¹³ In the analysis the local participation variable was divided into two:

1. Small farmer involvement in idea evolution and project design.
2. Small farmer involvement in project decision making during project implementation phase.

The regression results showed that local participation accounted for 49 percent of the variation in the overall project success scores among projects examined in Morss' study. The variable most closely associated with project success was: involvement of small farmers in the decision making during project implementation stage.

C. THE KEMUBU PROJECT--AN ILLUSTRATIVE CASE

Kemubu, a World Bank sponsored project in Northeast Malaysia, provides an opportunity to examine success and failure elements related to the above problems. This project is one of the three major irrigation projects in Malaysia designed to increase rice production in Malaysia. The other two projects are the Muda project in the State of Kedah and the Besut project in the State of Trengganu.

Malaysia, like her neighbors, is attempting to attain self-sufficiency in food production through adoption of modern agricultural inputs and infrastructure. The experience of Malaysia during the 1974-1975 world grain shortage reinforced her policy decision to rely less on

¹³ Elliot R. Morss, *Strategies for Small Farmer Development: An Empirical Study of Rural Development Projects* (Washington, D. C.: Development Alt. Inc. for AID, May 1976).

imported rice. The Kemubu project is geared towards meeting the objectives of increasing domestic rice production as well as farmers' incomes.

The project involved the construction of irrigation and drainage systems in an established paddy farming area. Construction works began in 1969 and were finished at the end of 1971. During the construction phase of the project, a project coordinator was appointed to head the management team. Operationally, the project was implemented by the coordinator largely through the existing agencies and departments within the Ministry of Agriculture.

In 1973 the Kemubu Agricultural Development Authority (KADA) was created to replace the initial project management organization.¹⁴ The project Authority's strategy was to work through the network of Farmers Associations established in Kemubu. The project programs included special assistance to farmers--provision of subsidized inputs (fertilizers and seeds), low interest rate production credit, rice marketing and seed exchange programs.

During the first five years (1972-1976) of the introduction of multiple cropping in Kemubu, some useful lessons were learned from the Kemubu experiences. Mistakes were made, but some ideas worked out quite well too.

¹⁴The Kemubu project includes the entire areas of the following irrigation schemes: Kemubu, Pasir Mas, Lemal and Salor. An Authority was formed in 1973, The Kemubu Agricultural Development Authority (KADA), to manage and implement multiple cropping in KADA. Unless otherwise specified, "Kemubu" refers to the whole KADA area.

The time span of this study extended to the time rice double cropping began in Kelantan. The Pasir Mas scheme was completed in 1958, double cropping on a limited scale began in this scheme as early as 1962. The Lemal irrigation scheme was completed in 1968 and farmers in the area have been double cropping from 1970.

Production constraints to higher productivity of rice appeared. Linkages between supporting agencies were not the best and often did not fulfill the target goals of the Kemubu project. However, the project authority approach and the implementation of its programs did seem to be effective in many ways.

D. THE OBJECTIVES OF THIS STUDY

Many projects provide opportunities for learning experience in agricultural development. The Kemubu project offered the writer exposure to such experiences. He was responsible for the agricultural programs in the project from 1970 to 1975.

Hence, with the above observations in mind, the study represented in this dissertation has had the following objectives:

1. To describe and document the activities of the Kemubu project from 1970 to 1977.
2. To assess the effectiveness of the project management organization and the adequacy of its linkages with farmers, other agencies and national development activities.
3. To ascertain the extent to which the overall project thus far has had impacts on rice production, farmers' incomes, farm employment

and certain less tangible objectives of Malaysian agricultural development.

E. APPROACH TO THE PROBLEM

This study has been approached as follows: First, the evolution of Kemubu was described. (See Chapter II.) This drew on the writer's experiences as Agricultural Division Head for the project, as well as on documents, reports and other available information on Kemubu.

Then the Kemubu experience so far was examined from three viewpoints:

1. *The impacts the project has had on individual farmers*--how the project has affected the typical farmer in terms of extension help, water delivery system, production credit, paddy production, paddy marketing, employment and income. (See Chapter III.)

2. *The project itself as a management entity*--the effectiveness of its organization, linkages with national agencies that have programs relevant to Kemubu's activities and linkages with local farmers through formal and informal interactions. (See Chapter IV.)

3. *The national development perspective*--how Kemubu has fitted into the national strategy of increasing rice production, increased farm employment opportunities, increased farm incomes and reduced poverty among paddy farmers. (See Chapter V.)

In examining the project, appropriate data from past studies on Kemubu and KADA statistical reports were used to prepare budgets for the representative owner and tenant farms for "before" and "after" situations. (See Chapter III.)

National aggregate data on paddy production, employment, distribution of income and poverty among paddy farmers were obtained from the Third Malaysia Plan, 1976-1980. Observations based on the writer's personal experience were used to supply additional facts and explanations.

At the same time, this study took into consideration other relevant works on agricultural project implementation, in the LDCs especially.

This literature was used as a point of departure in:

1. Conceptualizing the Kemubu experience.
2. Setting it in broader perspective.
3. Identifying improvements that might have been made in the Kemubu approach.

F. SUMMARY

This chapter has dealt with the project approach to agricultural development--how projects have evolved and the management organization of projects. Current literature on agricultural project implementation in the LDCs has been used to conceptualize the setting of the Kemubu experience.

The usefulness of examining the Kemubu project in Malaysia as a case example of project implementation has been emphasized.

The approach adopted for this study has been outlined. To determine the success and failure elements thus far seen in Kemubu, this study is examining the project from three viewpoints:

1. The farmer.
2. The project as a management entity.

3. Contribution to Malaysian national development.

The three chapters that follow will deal with each of these viewpoints in turn.

CHAPTER II

DESCRIPTION OF KEMUBU AND HOW IT EVOLVED

A. INTRODUCTION

The project is located in the state of Kelantan in Northeast Malaysia (Figures 2.1 and 2.2). The KADA Authority, an agency established in 1973, took over from the Drainage and Irrigation Department of Kelantan the existing irrigation schemes at Salor, Pasir Mas and Lemal. Including the World Bank-sponsored Kemubu project, the KADA Authority's jurisdiction includes four irrigation schemes.

The Salor scheme, located in the bend of the Kelantan River, had been irrigating an area of 4,100 acres since 1951 from a pumping plant located on the right bank of the Kelantan River.¹

Across from the Salor scheme, two more irrigation schemes are located on the left bank of the Kelantan River. Pasir Mas scheme was completed in 1958 and the Lemal scheme in the late 1960's. All these schemes obtained their water supply from the Kelantan River:²

¹IBRD, *Kemubu Irrigation Project Malaysia* (March 1967), p. 2.

²*Ibid.*, p. 3.

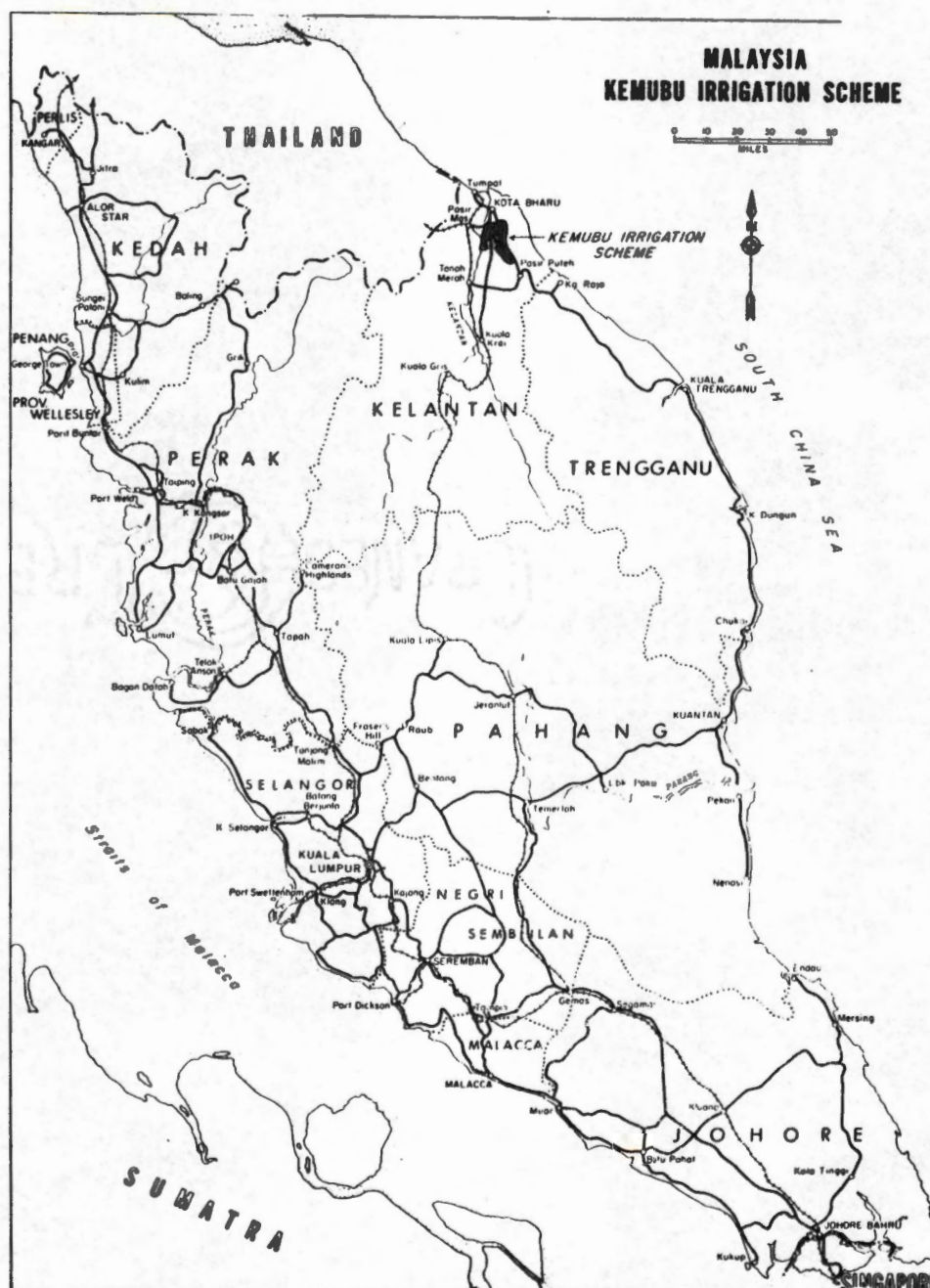


Figure 2.1. Location of The Kemubu Project in Malaysia.

Source: Reproduced from IBRD, *Kemubu Irrigation Project Malaysia* Report No. TO-578a (March 1967).

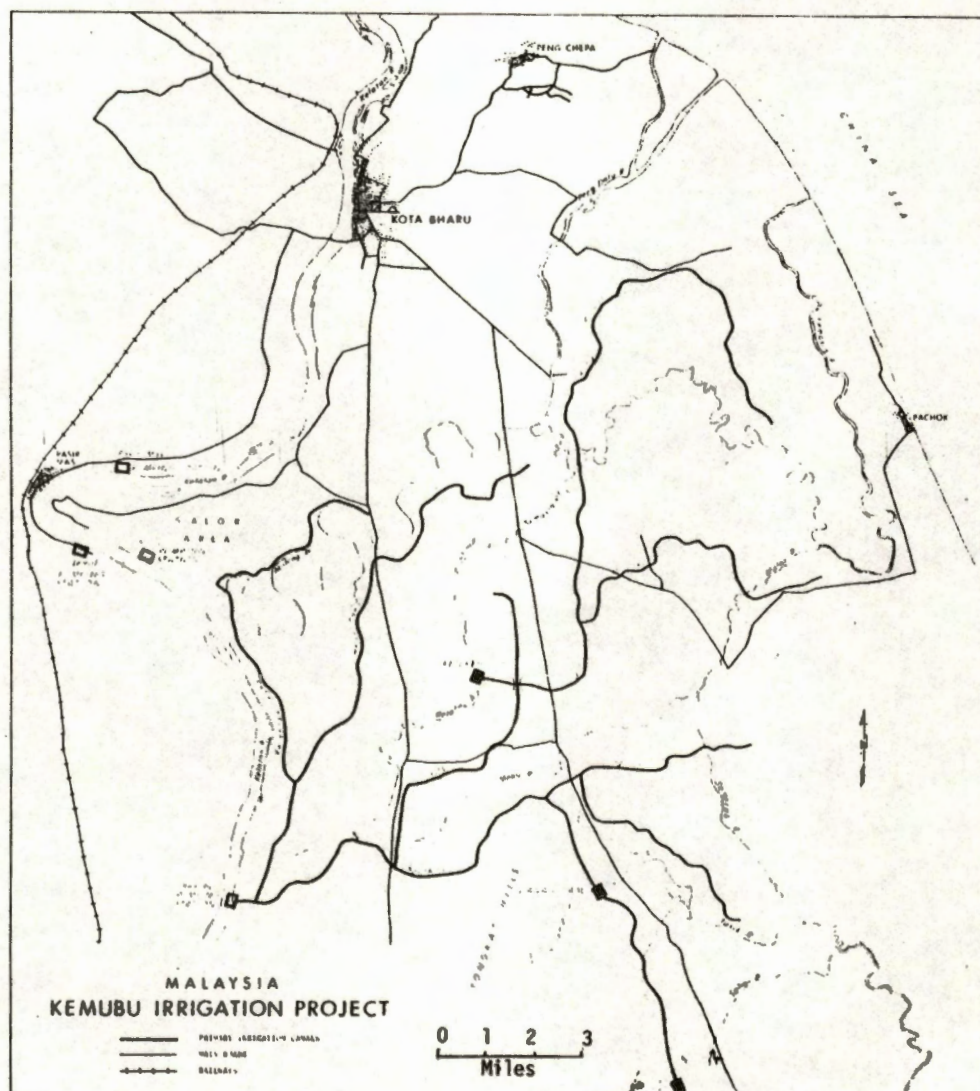


Figure 2.2. The Kemubu Project Area and Its Major Irrigation Canals.

Source: Reproduced from IBRD, *Kemubu Irrigation Project Malaysia* Report No. TO-578a (March 1967).

<u>Scheme</u>	<u>Area (acres)</u>	<u>Number of pumps</u>	<u>Total hydraulic capacity (cusecs)³</u>
Salor	4,100	2	80
Pasir Mas	5,100	3	150
Lemal	24,500	4	800
Kemubu	47,000	5	1,250

The Kemubu project works included the installation of a pumping station, construction of irrigation canals, drainage systems and improvements to river channels to improve drainage. The Kemubu irrigation distribution system consisted of three main canals to feed a series of secondary canals which in turn supply the tertiary system.⁴

The project was designed to form irrigation units of approximately 48 acres each. The water for each unit would be delivered from the tertiary system to an earth ditch, called a "quartenary," which would carry water to the highest point of the irrigation unit.⁵ Hence, water would overflow from the highest plots in the unit to the lowest plots. The water would pass through the land of several farmers. The system was designed with sufficient capacity to deliver one cusec per 60 acres of paddy farms.

³An output of one cusec means the system can irrigate an acre foot of paddy field per second.

⁴Ibid., p. 5

⁵The original preliminary work on the project designs was from documents prepared by the Malaysian government with assistance from two consultants (Sir William Halcrow and Partners and SOGREAH) who did survey work in the project area between 1960-1964.

In 1967 the State of Kelantan had about 80,000 farm families. Of these, about 36,000 lived within KADA area. The estimated population growth rate for Kelantan was 2.2 percent per year. The average family size was 5.2 with 2.6 labor units employed on the farm.⁶ The average farm was 3.0 acres in the Kemubu area and the paddy farm size average was 2.2 acres.⁷ Farm sizes were still smaller in the other irrigation schemes in KADA. In Lemal there were 16,000 farm families on an area of 24,500 acres of paddy farms. The average farm size in Lemal was 2.7 acres with 1.7 acres on the average paddy farm.⁸

Farmers operated 2 or 3 parcels of land. The area each farmer cultivated depends on the status of the operator as can be seen below:

<u>Type of operator</u>	<u>Paddy area (acres)</u>	<u>Percent of farmers</u>	<u>Percent of farm land</u>
Lemal ⁹			
Owner-farmers	0.7	24	10
Tenants	1.7	61	59
Owner-tenants	3.7	15	31
Kemubu ¹⁰			
Owner-farmers	1.9	58	50
Tenants	2.5	20	21
Owner-tenants	3.0	22	29

⁶This was for the KADA area.

⁷A farmer may own paddy land and other cropland. Paddy farm means the area of his farm used for rice cultivation.

⁸World Bank, *Malaysia Appraisal of the North Kelantan Rural Development Project* (Report No. 1137-MA, April 1976), pp. 4-5.

⁹Ibid., Annex 13, p. 2.

¹⁰World Bank, *Kemubu Irrigation Project Completion Report*, Annex 3, p. 2.

The average size of paddy farm in all of West Malaysia was 3.1 acres. Kelantan's average was 2.3 acres.

A substantial portion of the paddy farmers in KADA are tenants. The common renting practiced in the project area is crop sharing where owners received 50 percent of the harvested crop. Land taxes are paid by the owners. Tenants provide the seeds and fertilizers.

Acreage of rice, the staple food in Malaysia, has grown considerably in Malaysia since the rapid expansion of multiple cropping towards the end of 1960's. During the 1970-1975 period, rice output in Malaysia grew 3.7 percent annually, higher than the growth rate obtained from rubber production (Table 2.1). Malaysia has had to import 10 to 15 percent of its rice consumption requirements annually from the rice exporting countries of Asia.

In 1968 Kelantan's rice double cropping area was only 6,600 acres. At full development of the KADA area, this would be about 80,000 acres in the state. Paddy output from the project area would be able to reduce the country's net annual rice imports.

It was anticipated that implementation of the project would improve the employment situation on paddy farms. The unemployment rate was high under mono-cropping. In the 1968 survey of the Kemubu area, it was found that labor utilization on Kemubu farms was about 316 man-hours per acre.¹¹ It was estimated that with double cropping labor utilization per acre

¹¹S. Selvadurai, *Socio-Economic Study of Paddy Farms in the Kemubu Area of Kelantan* (Kuala Lumpur: Ministry of Agriculture, 1968).

Table 2.1. Growth of Agricultural Output in Malaysia 1971-1975
(1970=100)

Crops and Livestock	1971	1972	1973	1974	1975	Percent Annual Growth Rate 1971-1975
1. Rubber	104	104	123	122	166	3.1
2. Palm oil	137	168	187	237	297	24.3
3. Timber	103	118	132	133	108	1.6
4. Rice	109	110	118	126	120	3.7
5. Coconuts	100	102	103	105	107	1.3
6. Pineapple	95	95	91	86	88	-0.4
7. Fish	108	104	132	152	156	9.8
8. Livestock	104	112	109	117	125	14.6

Source: *Third Malaysia Plan 1976-1980* (Kuala Lumpur: Government Printer, 1976), p. 286.

would be about 800 man-hours cropping two paddy crops per year.¹² Multiple cropping would generate employment on paddy farms for most of the seasonally underemployed labor under single cropping, especially during planting and harvesting periods. These new peaks in demand for hired labor resulted not only from the *added operations* of two crops a season; multiple cropping imposed timeliness in paddy cultivation and farmers would have to keep pace with the irrigation water distribution.

Initial construction costs of the Kemubu project were M\$66 million. Of this total investment, M\$30 million was from the World Bank loan. The loan was signed in June 1967 and became effective in October 1967. The construction work began in September 1968.¹³ The Bank loan covered the foreign exchange component of the investment consisting of imported equipment, consulting services and interest charges.

The final project cost was M\$66 million--27 percent more than the estimated investment of M\$52 million made at appraisal. The cost overruns were largely because the construction of additional quaternary canals, bridges and Farm Development Centres (Farmers Association Offices) which were not planned during the appraisal negotiations. The project cost components were as shown in Table A-1. The World Bank loan of M\$30 million would be repaid over 25 years, with an initial five years' grace period. The Malaysian government began to repay the loan in August 1975.

¹²World Bank, *Kemubu Irrigation Project Completion Report*, Annex 5, Table 3.

¹³World Bank, *Kemubu Irrigation Project Completion Report*, Annex 2, pp. 3-4.

B. HOW WAS THE PROJECT IMPLEMENTED?

Implementation of Kemubu can be divided into three areas or phases of development:

1. The construction phase.
2. The agricultural phase.
3. The management organization phase.

The Construction Phase

The main works included the installation of five diesel pumps; a network of primary, secondary and tertiary canals; a drainage system, including realignment of rivers; and a flood protection levee along the Kelantan River. A consultant, SOGREAH¹⁴ was appointed in 1968 to supervise construction. Construction work began in September 1969 and it was planned to be completed by July 1971. The project construction was planned to take about 2 to 3 years. The first dry season crop was planted in 1972 rather than 1971 as originally targeted at the appraisal stage of loan negotiations.

The physical construction of the irrigation structures did not incur many problems. The consultant, SOGREAH, was also the designer of the engineering layout. The engineers from the Drainage and Irrigation Department assigned to the project had considerable expertise in the supervision of on site works, as the Pasir Mas and Lemal schemes within the KADA Authority had been designed and built by them.

¹⁴Societe Grenobloise d'Etudes et d'Applications Hydrauliques (SOGREAH), a French consulting company.

The Agricultural Phase

In Kelantan rice double cropping began in 1962 on a limited scale. When the Lemal Irrigation Scheme was completed, rice double cropping in the state increased to 25,700 acres by 1970. The total area under multiple cropping in 1970 made up 30 percent of the KADA paddy acreage. In 1972 the first double cropping in Kemubu was carried out. This increased the total area under multiple cropping to 44,000 acres, 55 percent of the total project area of 80,000 acres.

The completion of the World Bank-sponsored Kemubu project made evident the need for coordinated efforts to regroup all existing irrigation areas in the State under one agency--hence, the establishment of the KADA Authority in 1973.

The project implementation strategy adopted for Kemubu were based on two criteria. First, Malaysia has had considerable expertise in rural development programs and, secondly, the new emphasis on regional development.

Basically project implementation in Malaysia has been based on the concept of integrated rural development administration. The Ministry of Rural Development was responsible for program and project coordination and the monitoring of all development activities. The underlying objective of the rural development programs for small farmers in Malaysia was to provide a catalyst towards attitude and behavioral changes among a large and scattered population of rural farm families.¹⁵

¹⁵Milton J. Esman, *Administration and Development in Malaysia* (Ithaca: Cornell University Press, 1972), p. 221.

Recognizing the fact that improvements in the delivery system are vital to agricultural development programs, the Malaysian government decided to start a system of small farmers participative institutions modeled after the Taiwan Farmers Associations. The purpose was largely to facilitate development administration and to organize farmers into small groups for self-help decision making roles.¹⁶

There were no existing rural institutions that could be adapted for the expansion of the farmers association system. Malaysia's rural communities were operating largely on the traditional administrative system that centres around the Village Headman (Penghulu) as the smallest administrative unit within any district. He represented the government on all matters at the local level, including both economic and social services.

The planning organization for regional development programs and the management of such projects as the Kemubu project can be illustrated as in Figure 2.3. The regional planning strategy gave special attention to the political needs of specific projects. The project management organization drew its policy framework from the national goals and received help from other agencies that have programs which would support project activities. These included extension services from the Department of Agriculture, research support from the Malaysian Agricultural Research and Development Institute (MARDI) and farmers' credit needs from the Agricultural Bank Malaysia. The Kemubu project management itself had

¹⁶Ibid., p. 222.

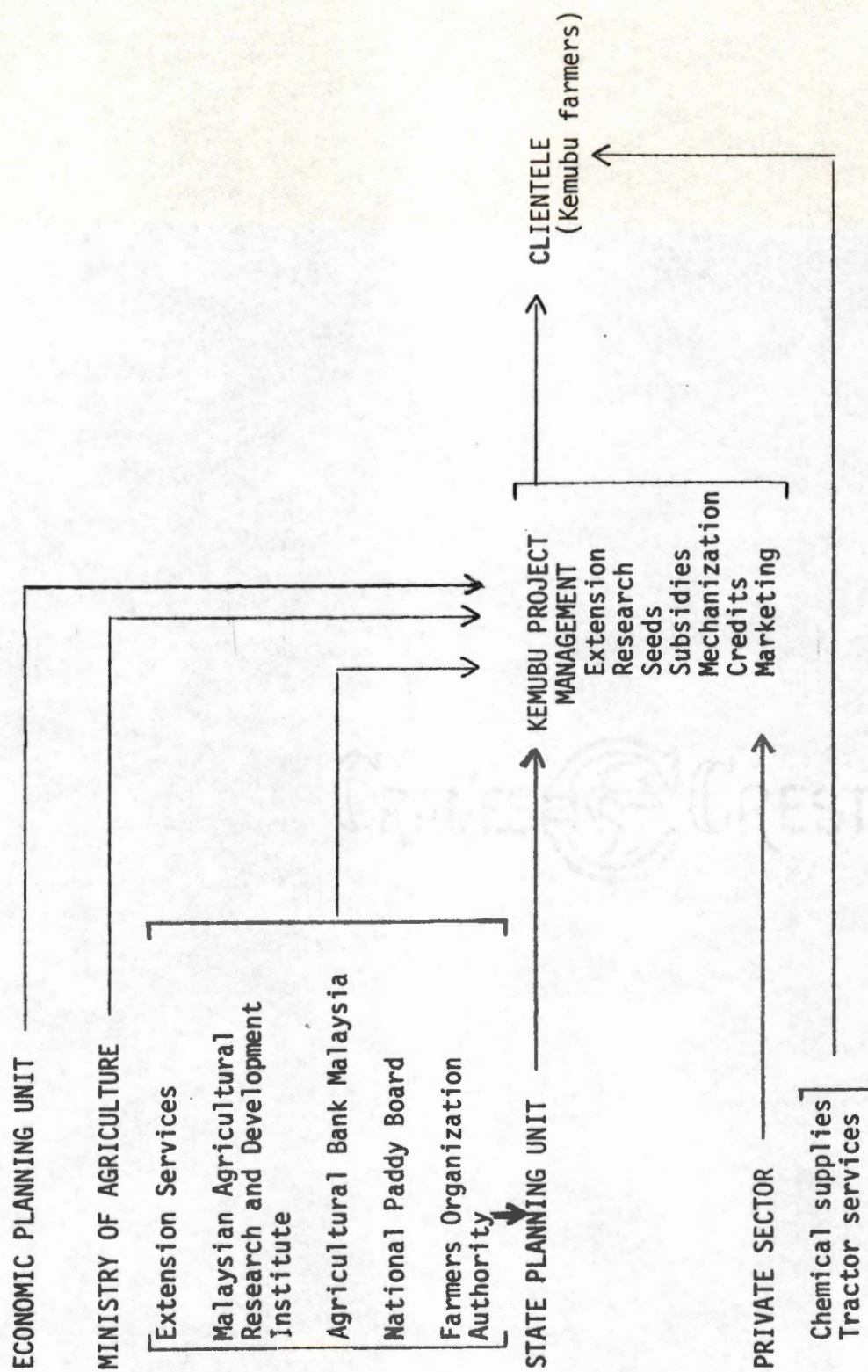


Figure 2.3. The management organization of the Kemubu project as a regional development project in Malaysia.

a built-in system--the farmers associations--for directing its activities to farmers.

Regional development goals within the overall agricultural development of Malaysia were stated as follows in 1976:¹⁷

Regional development during the plan will be aimed at pushing development further to the less developed states. With more aggressive policies to push development further towards the least developed states, Trenggau's per capita GDP will be raised to about the national average while that of Kelantan will reach almost 70% by 1990. These will be brought about by measures to increase agricultural productivity. . . . Kelantan's per capita GDP will increase from M\$589 to M\$1,878 in 1990 compared to the average for Malaysia of M\$1,250 and M\$2,767.

. . . Kelantan's per capita GDP relative to the mean will grow from 47% in 1975 to 68% in 1990.

In Kemubu, the onset of rice double cropping saw the rapid growth in mechanical power for land preparation. This reflected two elements. First, the government policy to facilitate rice double cropping gave rise to the need for additional tractor power beyond the normal level of a single rice crop technology.¹⁸ Secondly, a high percentage of Kemubu farmers had been part-time farmers when the area was a single crop area. Before multiple cropping the percentage of off-farm income earned by farmers was higher than income earned from paddy farming. This was an economic rationale on the part of farmers, since they operated small size

¹⁷ *Third Malaysia Plan*, pp. 205, 214.

¹⁸ This observation was in agreement with Ruttan's analysis on the net effect of the contributions and impacts of the new seed fertilizer technology. See Vernon W. Ruttan, "The Green Revolution: Seven Generalizations," in *International Development Review* 1977/4 (December 1977), pp. 16-23. "It is consistent with available evidence to view the mechanization of land preparation . . . that have been identified with the green revolution as primarily a response to changes in the relative prices of mechanical power, relative to animal power and labor, rather than as technical complements to the new-seed fertilizer technology."

farms. The average paddy farm in Kemubu was only 2.2 acres.¹⁹ Many Kelantan farmers were enterprising in the sense that they traditionally migrated to Muda (another rice area in Malaysia) during paddy harvest there. Muda is about 300 miles north of Kelantan. Kelantan farmers fulfilled the peak labor demands during the harvesting in Muda.

The first irrigated dry season crop in Kemubu was planted in March 1972. The seeds used were all short maturing varieties (requiring only 150-180 days to mature). The varieties were *Bahagia* (IR5-Malaysian selection), *Mahsuri* (another Malaysian hybrid), *Ria* (IR8) and *Jaya* (another Malaysian hybrid, C4-63). The ready availability of these hybrid rice seeds to Kemubu farmers meant they could be expected to change from the traditional native varieties rapidly. The plan was that only short term rice seeds were to be planted in both the dry and wet season.

— However, the rate of adoption of these new varieties was slower than expected. This may indicate the problems involved in technology / transfer--i.e., diffusion of technological innovations. In Kemubu, after four seasons (beginning with 1972 dry season and ending with the wet season crop of 1973) native varieties still comprised 50 percent of the seed planted. The normal practice by farmers in Kemubu prior to rice double cropping was to plant many varieties. This was the result of farmers' practical experience with the varied terrain, soil types and rainfall patterns. They had arrived at the variety most suited to each particular field on their farm. Thus, with little experience as to the performance of the new short term varieties, farmers were still using

¹⁹S. Selvadurai, op. cit.

native varieties in the wet season in order to reduce the risk of short-fall in returns. Another major reason for farmers preferring the traditional varieties was that the market prices of the new rice (short term varieties) were slightly lower than the traditional varieties.

The underlying premise in technology diffusion of a new farming system such as rice double cropping was the new seeds would perform well. However, varieties that were judged to be superior on the basis of experimental station results and under very ideal agro-economic practices sometimes performed differently on farmers' fields. In Kemubu, *Bahagia* was a case in point of the shortfalls in performance under farmers' conditions. This variety demanded high nitrogenous fertilizer levels to attain the yields obtained under experiment station conditions. Traditionally, fertilizer costs in Kemubu were higher than anywhere else in Malaysia. A 15 to 30 percent price differential exists between Kelantan and the Muda area.²⁰ As a result farmers were not motivated to apply more fertilizers to *Bahagia* than to their traditional varieties. Yields were less than expected. In addition, this variety had the undesirable characteristic of being difficult to thresh. Compared with another variety, *Mahsuri*, *Bahagia* costs per acre more to harvest. It requires more labor than *Mahsuri*. This increases total production costs.

As part of the shift to a rice double cropping system, nursery practices had to be on a communal basis to fit into the pattern of water distribution. To ensure that irrigation water did not go to waste, the

²⁰ Moktar Tamin and N. Hashim Mustapha, "Kelantan West Malaysia," in IRRI *Changes in Rice Farming in Selected Areas of Asia* (Los Banos, Philippines, 1975), p. 221.

extension staff of the project and farmers leaders helped to select suitable nursery sites. Normally in this type of gravity flow of irrigation water supply, the main offtakes would be located on higher plot relative to the rest of the field to be supplied from an irrigation unit. The standard practice was to locate the nursery as close to the offtake as possible. Participating farmers in the project were allotted their respective nursery sites.

It was important to teach farmers that the nursery practices for a short-term variety rice technology called for very close supervision to ensure rapid growth of the seedlings. After 20-35 days in the nursery, seedlings were ready for transplanting in the field. This created problems for farmers. Traditionally, farmers would locate their nursery as close to their farmstead as possible to facilitate their constant attention. Under a single rice crop system time was not a severe constraint since they would have considerable leeway in field operations. But it was no longer true under an irrigated two-crop system. The field operation had to fit the rigid schedule of irrigation water distribution. Farmers willingly participated in the communal nursery system as long as the project management provided free nursery fertilizers. But as soon as the fertilizer was no longer made available to farmers, the tendency among farmers was to revert to their traditional practice. Nurseries had the tendency to become more scattered, and some failed to receive proper water supply during the growing stages of seeds in the seed-beds. These unmanaged nursery practices subsequently resulted in uneven field plantings which made the scheduling of water supply more difficult. By the time water was supposed to be cut off, there were still farmers with

unripened crops. To continue supplying water to these unripened fields would necessarily flood fields that were ready for harvesting. Harvesting in flooded fields increased the costs of harvesting and impinged on the time constraint of a two-crop regime.

The above problems have been cited to indicate some of the technical dimensions and issues in the diffusion of new farm practices. This has ramifications for project management and the success of programs to ensure rapid increases in crop output.

In 1970 the coordinator's office, in cooperation with the departments of Agriculture and Irrigation, began "pilot projects"²¹ specifically programmed to facilitate the following: (1) seed multiplication, (2) fertilizer use, (3) production credit and marketing, (4) water management and controls, and (5) farm mechanization. The overall objective was to let farmers become aware of the labor costs, input needs, water requirements and the crop calendar for two rice crops in a year. The programs were extension type programs.

Initially, the results of the pilot project programs in Kemubu may be successful though but, the time-frame over which the activities were carried out, i.e., over four seasons was too short. Indeed, too short to have sufficient impacts on farmers. The inconclusive research on the type of seeds that was suitable for large scale planting compounded the above problem. Farmers absorbed losses from the poor crop performance that resulted from the poorly chosen and unpure progeny seeds that were

²¹The appraisal report envisaged that each agency would play its part independently. However, in 1968 the Government of Malaysia recognized the weakness of this approach and appointed a general coordinator administrator.

distributed. When the first dry season crop was planted in Kemubu in April 1972 seeds, fertilizer levels, credit and tractor services were not adequately evaluated in terms of costs and returns.

C. THE PROJECT MANAGEMENT ORGANIZATION PHASE

The Kemubu Coordinator Multi-agency Task Force

In 1969 when the contract agreement for the construction of the engineering facilities designed for the project was signed, the Ministry of Agriculture appointed a Coordinator to coordinate the agricultural programs and supervise the construction works. (See Figure 2.4 on the structure of this office.) At this point in time one should give credit to the Ministry of Agriculture for clear foresight in determining the proper organization to manage a project of this magnitude.²²

The project organization of the Kemubu Coordinator multi-agency task force was similar to the administrative structure set under the Malaysian Rural Development programs. The Coordinator headed a team of administrators and technocrats from federal and state levels.

During the construction phase of the project, the coordinator's system worked adequately to meet the target dates for completion of the engineering features of the irrigation facilities. This was very much due to the design specifications, the monitoring and the supervision of the construction work by an independent engineering consultant. The

²² World Bank, Malaysia Loan 500-MA: *Kemubu Irrigation Project Completion Report* (June 1975), p. 10.

There was very little consideration given at the project preparation and the appraisal stages of the form that the project management should take or of the need to coordinate closely engineering planning with agricultural extension and credit.

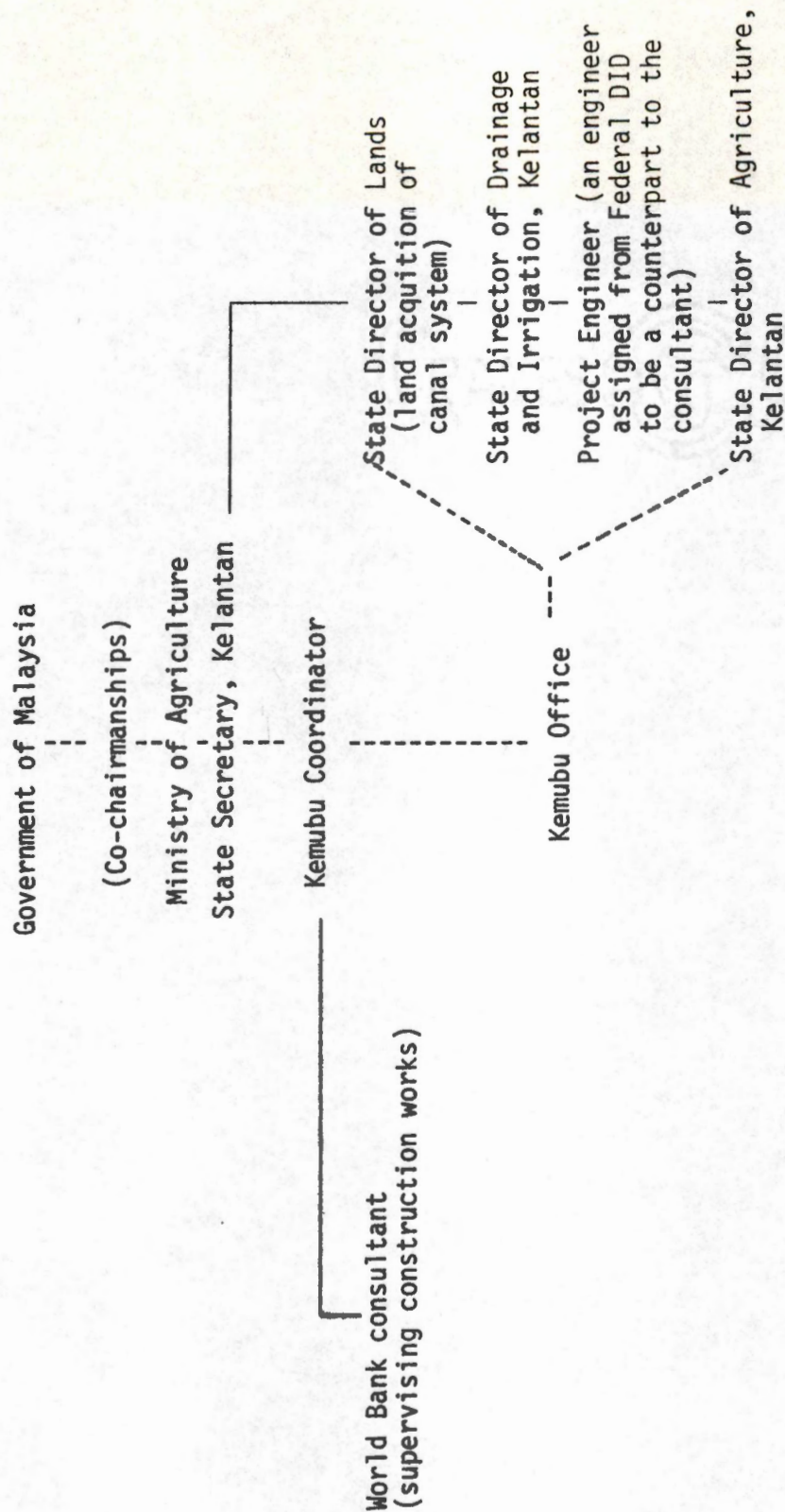


Figure 2.4. The Kemubu coordinator's multi-agency task force.

employment of the consulting service was a component of the loan. At that time, the Government was interested only to see that its original budgeted estimate for the project was met with no undue cost overruns. On this score, the Coordinator's office was successful.

But in terms of programs that would facilitate the introduction of rice double cropping, the coordinator type of management and organization was not effective. The basic reasons were that the technical functions of preparing the needed inputs toward a successful rice double cropping agriculture were not vested with the coordinator's office. The research and extension services were the traditional functions of the state and federal departments of agriculture. In addition, the initial personnel assigned to the coordinator's office were mainly administrative staff.

The Kemubu Authority (KADA)

The multi-agency task force, while effective during the construction phase, did not fit into the subsequent agricultural development phase. In 1973, the project management authority was reorganized to replace this initial Kemubu multi-agency task force.

High degree of risk and insecurity among farmers in the less developing nations call for a project agency and management which can adapt its organization and methods to changing circumstances. Thus in Malaysia the Farmers Association (FA) system²³ was the organization that was expected to revamp the traditional extension system. The traditional extension offices for the most part were seen by farmers as agents of authority. Hence extension was not the appropriate vehicle to spearhead

²³See Figure A-1 on Farm Development Centres.

integrated growth and the development of modern farm communities with new crop enterprises and skills such as called for by the new rice technology.

The FAs therefore became the basis for the project development and growth. The FAs institutional setup meant an entrepreneurial assignment and attitudes. In Kemubu during the early years of the project we saw the multi-tiered government agencies imposing their functions on the grass-root organization--the FAs. The FA staff was enthusiastic in its desire to absorb all the traditional roles of extension so as to become identified with the smallholders. The start of the Kemubu irrigation water supply meant that Kemubu had to be on the move rather rapidly in reaching the farmers. The mechanism to expedite the process was the FA. But it was too much to expect the Farmers Association leaderships to absorb the roles of the water resource department, rice-technology innovator and the credit-agency provider all at the same time.

At this stage of the program in Kemubu, the coordinatorship system of management did not seem to fit the new desired rate of rapid development. In the first place, the Kemubu office under the Coordinator did not have clear-cut policies for hiring personnel. Most of the personnel manning the FAs were seconded from the State Department of Agriculture. It must be said that the coordinatorship system of management was adequate during the construction phase of the project, but was no longer adequate when the actual double cropping phase has to be carried out by the farmers in the project.

Under the Coordinator, the staff at the farm level, extension workers from the State Agricultural Office, technicians from the Drainage

and Irrigation Department (DID) and personnel assigned to the FAs did not have the needed identification with the activities to be carried out in the project.

Therefore in 1974 the Ministry of Agriculture recognized the challenge of the tremendous task ahead of meeting the rice production needs of the nation. The Ministry decided that such capital investment irrigation structures should be managed by a more developmental oriented organization. Hence an Authority--The Kemubu Agricultural Development Authority--was established (Figures 2.5 and 2.6).

D. SUMMARY

The organization of the Kemubu project has been described. The evolution of the project and the formation of KADA has been made clear by reviewing the introduction of rice double cropping in Kelantan. As we have seen, rice double cropping began initially with Pasir Mas Scheme. It was followed by the Lemal Irrigation Scheme in 1970. Kemubu began its multiple cropping program in 1972.

The project costs and the designs of the irrigation infrastructures have been reviewed. Early implementation issues in the area of multiple cropping have been highlighted. The performance of the project implementors and the responses from farmers were reflected on the project organizational set up.

In the beginning the Kemubu project management format was the multi-agency task force. This organization was well suited for the construction phase, but did not meet the needs of integrated agricultural development.

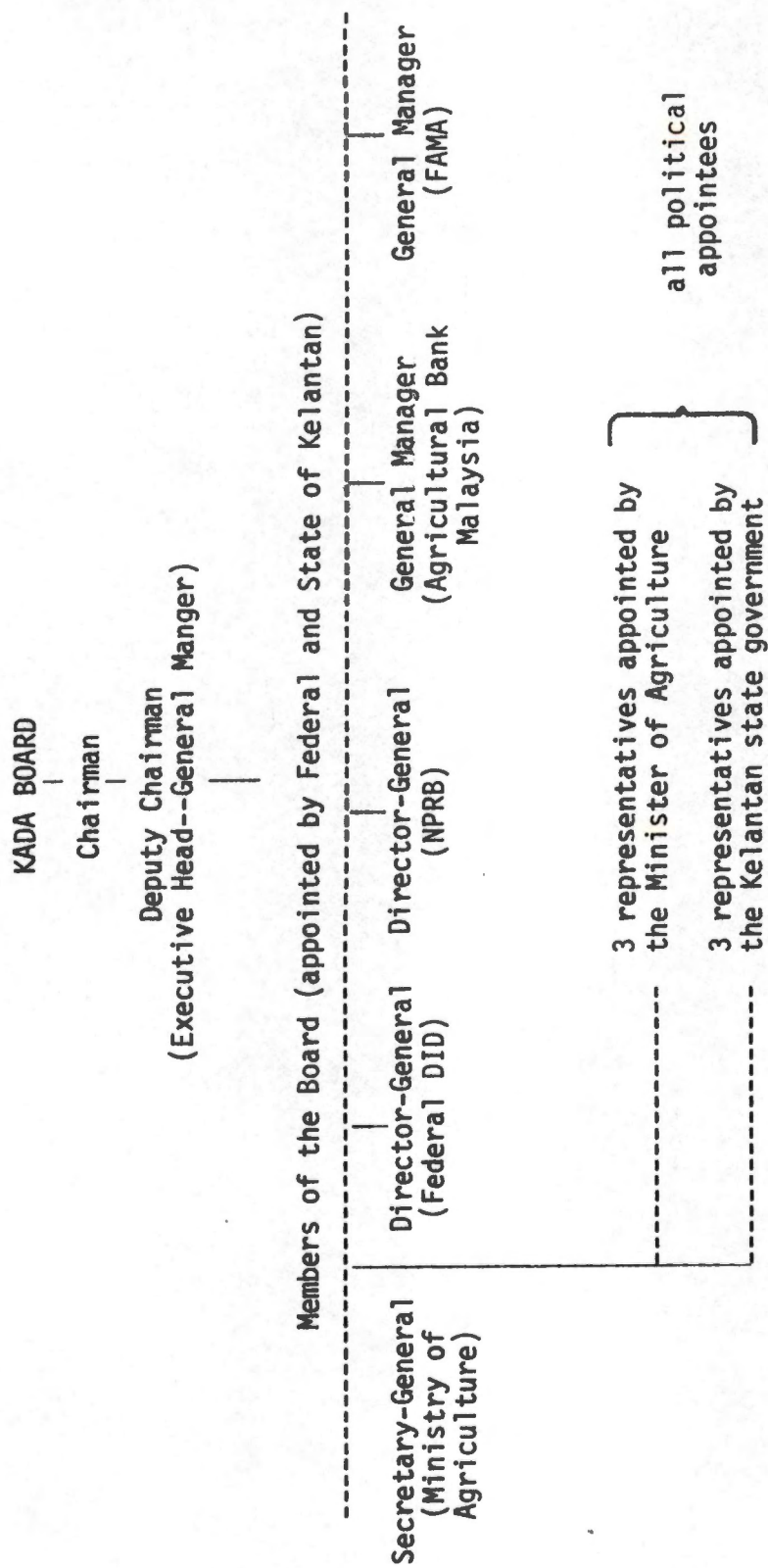


Figure 2.5. The organization of the KADA Authority.

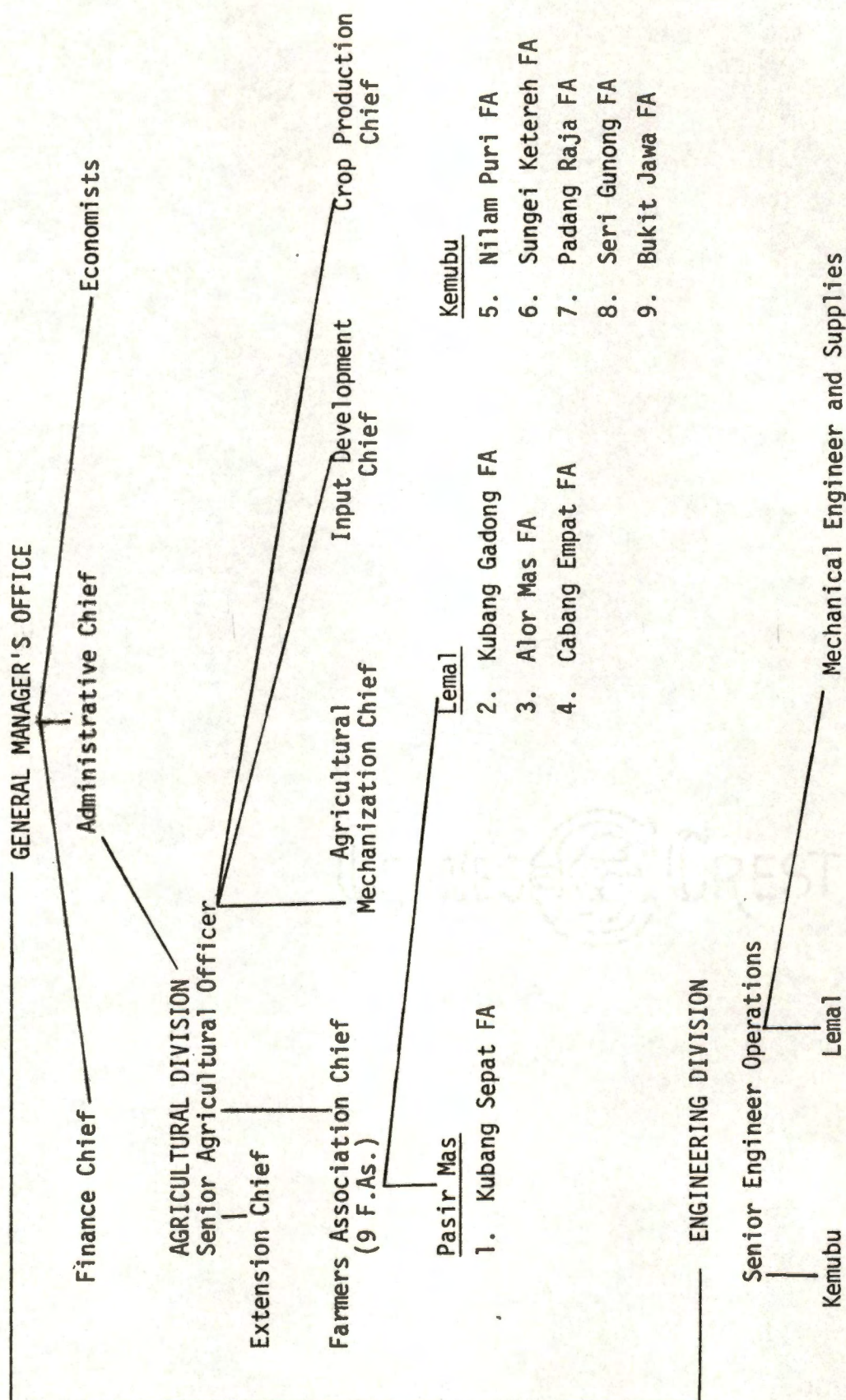


Figure 2.6. The organization of the KADA General Manager's Office, the Agricultural Division and the Engineering Division.

The KADA Authority was formed in 1973 to replace the multi-agency task force. The Authority was created as part of a national strategy aimed at developing the poorer states in Malaysia, including the State of Kelantan.

CHAPTER III

KEMUBU FROM THE TYPICAL FARMER'S VIEWPOINT

A. INTRODUCTION

In this chapter the links between the Kemubu project and farmers will be examined in systems perspective. The situation of a representative farmer at the end of an irrigation distribution system will be simulated to bring to focus the technical and social adjustments that he would be faced with upon switching from the traditional rainfed rice paddy to an irrigated rice crop.

This chapter will raise such questions as: What kinds of extension services or technical help could such a farmer expect to receive? Would he have more access to production inputs, credit and rice marketing services as an outgrowth of Kemubu?

More broadly, how has the project benefitted typical farmers in the Kemubu area, in terms of incomes and employment opportunities? Farm budgets for representative Kemubu farms--both tenant farms and owner farms--will be estimated. These representative budgets for "before" and "after" situations can provide some picture of the farm level gains from the Kemubu project.

B. LINKS BETWEEN KEMUBU AND FARMERS, IN SYSTEMS PERSPECTIVE

We may visualize agricultural development as a systems concept which shows key interrelationships. Kulp¹ has suggested a systems concept which emphasizes "program systems" and "client systems" (Figure 3.1). Applied to Kemubu, this means the need to understand not only the linkages themselves, but also the project's clients (farmers).

Every development program hopes to change the state of a clientele group--small farmers, in this case. How should the client system interact with the program system.

The program system would involve linkages with other institutions that provide support services and inputs for production. In Kemubu, production credit came from the Agricultural Bank, while FAs provided extension help to farmers. Research support for the project came from the Malaysian Agricultural Research and Development Institute (MARDI) and the Crop Production Section of the Federal Department of Agriculture (DOA).

C. HOW THE KEMUBU WATER DELIVERY SYSTEM AFFECTS

A TYPICAL FARMER

Let's take a representative farmer, Dollah, whose rice paddy field is located in an irrigation unit called "Block A." The irrigation water supply to "Block A" and the farmer's field is depicted in Figure 3.2.

¹Earl M. Kulp, *Designing and Managing Basic Agricultural Programs* (Bloomington, Indiana: PASITAM Publications, 1974).

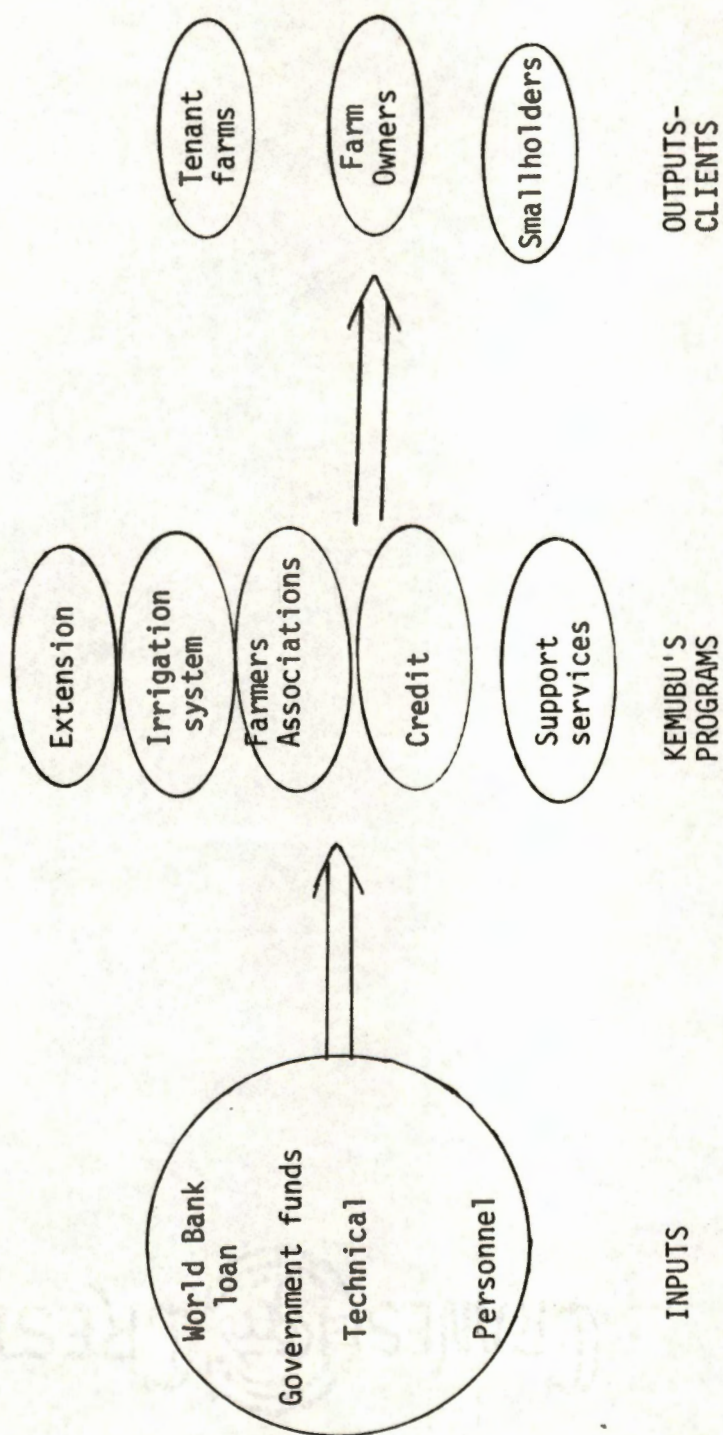


Figure 3.1. Kemubu in systems perspective.

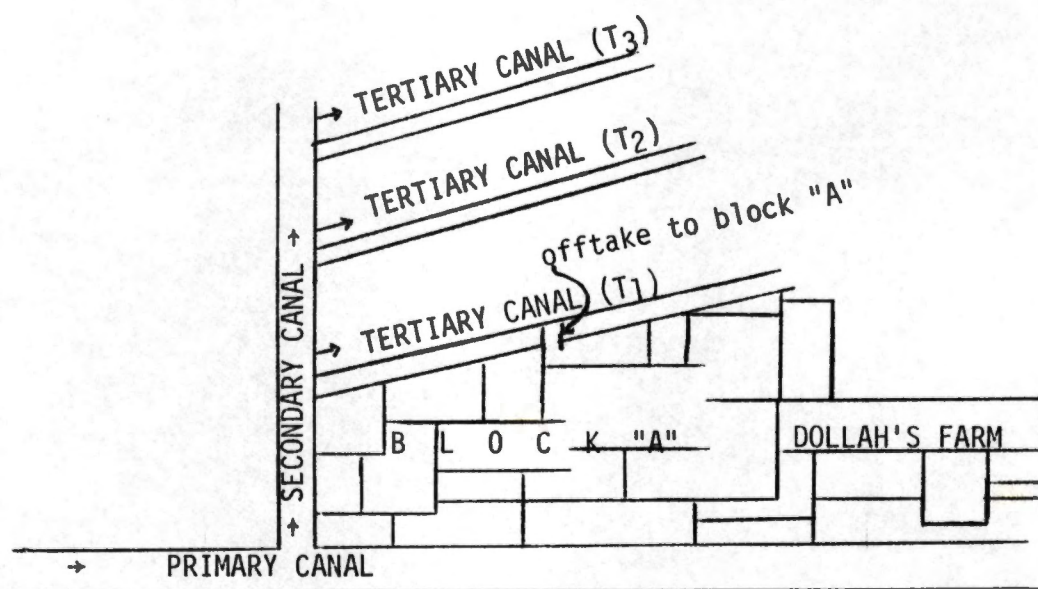


Figure 3.2. A schematic illustration of block "A" and Dollah's field showing the supply of irrigation water.

Dollah's field is located several plots away from the main offtake to "Block A." The tertiary canal (T_1) is the source of irrigation water supply to his farm. Dollah's field is on a slightly elevated plot, a few inches higher than the adjacent fields. This prevents him from receiving water on time and keeping scheduled planting dates.

Under the simulated situation presented here, several problems may work against Dollah. First, he would not get his water on time to prepare seed-beds to sow the nursery and, hence, he would be behind in his field operations. Secondly, he is located at the tail end of the distribution system. He would receive irrigation water only after his neighbor's fields have already had more than enough water, which would mean sowing several days late. Thirdly, it could even happen that, before any water gets to Dollah's field, the main supply from the pumphouse has been cut off.

Irrigation for rice double cropping means that farmers would have to adhere rigidly to the water and crop calendar established by the project management. Late cultivation would mean lower yields or even serious crop losses. From a technical standpoint, the issues are complicated. The planning and implementation of irrigation systems for multiple cropping would best be the responsibility of those persons familiar with the technology. At the local level, the responsibility of the extension agents would be to educate water users the correct and efficient water utilization practices. On the other hand, Dollah may have unique local knowledge and experience that could influence the way the overall irrigation system might be operated. If so, Dollah's local knowledge would be very useful.

In the Kemubu case, the Drainage and Irrigation Department (DID) technicians, up to 1975 at least, were mainly concerned with the system designs of the irrigation infrastructures, water flows and scheduled pumping hours. They have been less sensitive to the constraints that have prevented Dollah from receiving adequately irrigation water. On the other hand, the agricultural extension agents, while familiar with the agronomic and crop husbandry demands of rice paddy crop, have been less sensitive to water wastage. The DID technicians would be very sensitive to the extra cost involved in pumping longer days beyond the set schedule, even though Dollah still was unable to sow his nursery. Hence, we could visualize the extent of conflicts among the project personnel as a result of training, orientation and perspectives. How best could Dollah maximize his water use? Dollah's problems derive mainly from the program system. The engineers and the agronomists should have built-in flexibility to accommodate Dollah's uncontrolled factor of unevenness of his field. The uneven terrain created undue constraint on Dollah to obtain adequate irrigation water on time.

In Kemubu some approaches were tried towards providing the needed flexibility in the program implementation.

1. Irrigation technicians and extension agents, wherever possible, were located within the same office. In most cases, they were located at the FA offices. Farmers visited the FA office to buy fertilizers, to obtain credit and to sell their rice crop. During these visits farmers would seek help or make complaints about the difficulty of getting irrigation water.

2. Staff training sessions on program development were scheduled on a regular basis, at least once every two months. Participants in this training included both DID technicians and FA extension agents.

3. One-day training courses have been tried. Farmers were invited to these short day-long courses where serious discussions of farmers' problems were held. Experts from both the engineering and the agricultural divisions were present during these farmers training sessions. As far as possible the staff tried to be good listeners during these farmer training sessions.

4. Major technical problems on irrigation water delivery systems would be considered at the monthly KADA board meetings. The board meetings were held at the Authority's office. The management of the project would present long term plans towards solving problems arising from faulty irrigation designs or structural failures that prevented a farmer such as Dollah from receiving full benefits of the Kemubu project programs. Elevated flumes across the fields have been constructed at several places so that water may be carried from the tertiary canals to fields like Dollah's. However, these were very expensive. They involved additional budgetary appropriations. Such problems merit consideration by the national government.

D. HOW HAS THE PROJECT AFFECTED THE TYPICAL FARMER IN THE KEMUBU AREA?

Are area farmers getting enough help from extension agents? A typical farmer like Dollah would face problems in getting extension help.

(1) If he were not a member of the local FA and (2) he came from an

isolated community where none or only a few of the farmers were members. In a small village with less than 30 farm families, it could very well be that no farmers were members of the FA. In practice each SAU area would include a village of 200 farm families. Smaller villages would be combined to form one SAU area. Membership in each SAU normally consisted largely of progressive farmers who would be better informed of the advantages of becoming members of the local FA.

Kemubu has adopted the FA system as its core program to accelerate extension related works. But the program has not been provided with enough personnel to service all farmers in the project area effectively. The development of an effective change organization, under the best of conditions, would require a great deal of time. By design, FA programs should facilitate contacts between farmers and project personnel.

In Kemubu only 30 percent of the project farmers are members of the associations as of 1976. In Chapter II, it was emphasized that the small agricultural units (SAUs) within each farmers association were too large. Each unit had as many as 100 members. This was not effective. The extension-agent-farmer ratio was too small. One extension agent was responsible for 3 to 4 SAUs. Hence, the extension agent-farmer ratio was 1:300 or 1:400, depending on the membership size of each SAU.

Conceptually, the farmer-association-system extension method is somewhat associated with what is commonly known as "group technology-transfer" method. This method is designed to serve a maximum number of clients in rural areas of developing countries in a short period of time, and at the least cost. The group technology-transfer approach, although

it has a low cost per client, may be somewhat limiting. It demands high and rigorous standards of training of personnel and highly motivated extension agents.

The low percentage of FA members in Kemubu suggests that the approach has weaknesses. A reason for this low membership ratio was the lack of ready cash for purchasing FA shares.² Fugimoto's study of the Kubang Sepat FA in 1973, showed that the rate of nonmembership in FA was highest among tenant farmers and lowest among owner-farmers.³ Many times, the FA personnel were faced with the issue of low membership ratios or were asked why the association membership growth rate did not increase, the typical reply was "We like to limit memberships within certain farm population percentage points, for fear that the FA personnel cannot adequately serve the credit and other services needed in a rapidly expanding and changing agriculture."

Do farmers have readier access to production credit? Before the implementation of the Kemubu project, the source of credit was from the "middlemen." Dollah would have to pay a high cost for credit from the "middlemen." In addition, there would be few sources of credit from Dollah's village since he came from a small community. Lenders of credit were paddy buyers and the input suppliers in the local area. Credit would be given in the form of inputs such as fertilizers. Under the

²To be a registered member of the farmers association, a farmer is required to buy a share certificate worth M\$5.00.

³Akimi Fugimoto, "Farm Management Case Study of Peasant Rice Farming in Kelantan," M. S. Thesis, University of Malaya (April 1975), p. 50.

traditional credit arrangement, Dollah would promise to repay the loan from his expected rice crop harvest. The amount of paddy would be based on the paddy price, as determined by the lender. Should paddy prices be higher at harvest than what was agreed, the benefit would be accrued to the lender.

Farmers may have had more opportunities to obtain credit as an outgrowth of Kemubu. But they did not use the credit facilities provided by the FA. In a 1971 sample survey of two areas within the project⁴ two questions were asked: (1) the reasons for the difficulty in obtaining credit and (2) the reasons why more farmers did not want to receive credit. The results were:

	<u>Salor</u>	<u>Meranti</u>
Percent farmers reporting difficulty of obtaining credit	42	70
Percent farmers reporting low preference for credit	61	51

The sample farmers responding to the first question gave two reasons for the difficulty of obtaining credit: (1) the complex loan application procedures and (2) their lack of collateral:

	<u>Salor</u>	<u>Meranti</u>
Percent farmers who mentioned complex loan procedure	30	41
Percent farmers who mentioned lack of collateral	25	35

⁴Moktar Tamin and N. Mustapha Hashim, "Kelantan, West Malaysia," in IRRI, *Changes in Rice Farming in Selected Areas of Asia* (Los Banos, Phillipines, 1975), pp. 201-223.

To the second questions, one reason was mentioned by the sample farmers--the low rice output from small farm size made loan repayment difficult:

	<u>Salor</u>	<u>Meranti</u>
Percent farmers giving this reason	35	30

Procedural problems in credit application were a major constraint that prevented farmers from using FA credit. Government-sponsored credit, as handled in Kemubu at least, tended to have a built-in paper work load. To mention a few of the difficulties:

1. Farmers had to apply for the loan with the association they belonged to well ahead of time, before each cropping season began;
2. Farmers had to have sufficient collateral, i.e., the amount of share capital (FA stocks) owned by members. Members who owned several shares would be considered to have better credit risks than members with only one share capital stock;
3. Credit was always given in kind and the inputs allowed were limited to fertilizers and hired tractor services;
4. Farmers were required to buy inputs from the same association from which they obtained credit;
5. Normally, the total inputs provided in the credit program were limited to those needed for one acre only. But very often this amount was used for the whole farm, thus resulting in minimal fertilizer and other input applications per acre. The end result was the poor yields realized by farmers, in spite of the fact that they were planting the new varieties of rice. The low yields obtained by farmers increased the magnitude of their aversion towards using FA credit.

Do farmers have more ease in rice paddy marketing? Let's look at the alternatives available to Dollah when selling his rice crop. The rice marketing channels would be as shown in Figure 3.3.

Before the implementation of Kemubu, farmers received low paddy prices. The FA bought the rice paddy crop at the government minimum guaranteed prices (GMP). The prices were ranging from M\$256 per ton in the 1972 season to a high of M\$416 per ton in 1976 and 1977 crop years. Farmers who received credit from the local FA sold their rice to the FA. By doing so, members would increase their dividends at the end of the year. Dividends to members were based on the volume of transactions members made during the year with the associations.

The farmers association system was intended to provide equal opportunities for all member farmers to benefit from whatever programs the FAs sponsored and managed. However, the elite landed owners still command status and consequently seek to capture special gains from farmers association programs. Once elected to the directorship of the board, these elite landowners were in a privileged position to plan and gain the most benefit from the programs that the associations came up with. In Kemubu there have been several instances where directors who were the traditional rice paddy buyers in the village influenced the association to give them the right to buy rice paddy from members in behalf of the association. Decisions to allow a particular board member to run this operation are made on the assumption that this director has the expertise and owns a pick-up truck to operate the rice paddy marketing. He is guaranteed a certain margin in the price differentials between the

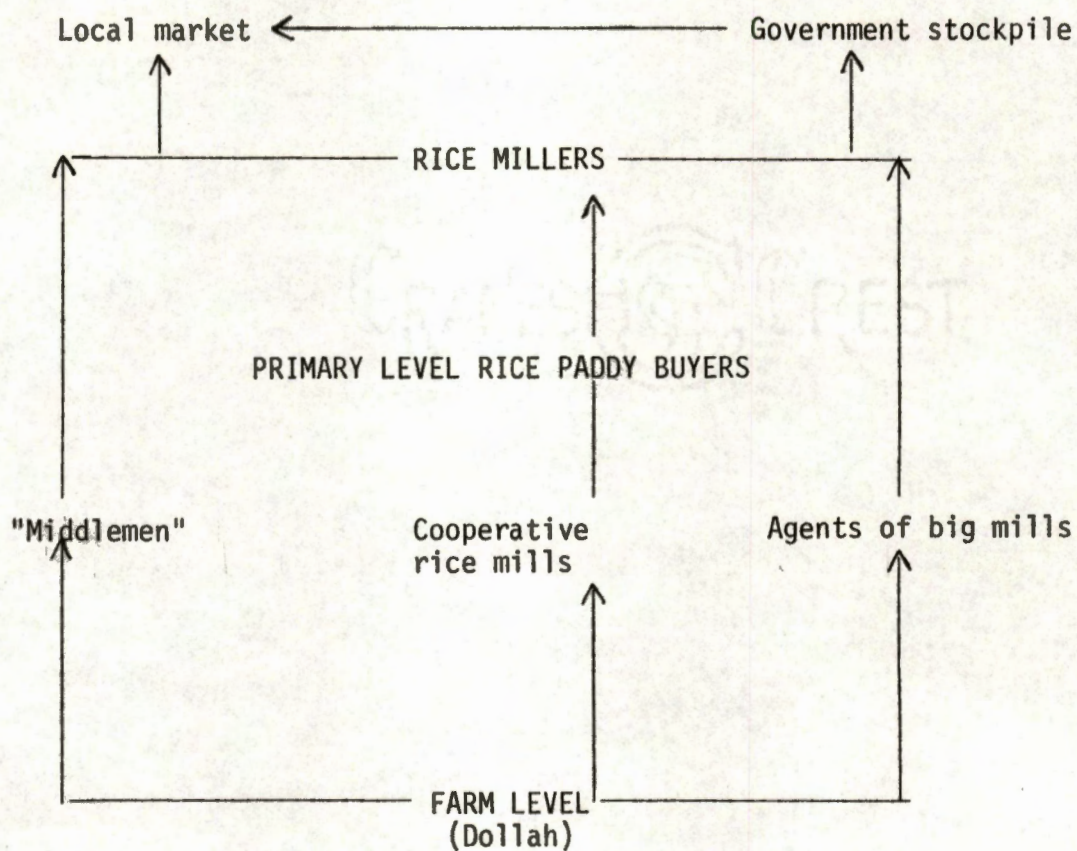


Figure 3.3. Paddy marketing channels without Farmers Association participation.

prices he paid members and the prices paid by the association--sufficient to cover his transport cost and other overhead charges for bringing rice paddy from the farm to the association stores. Farmers can be said to have better access to marketing services, but the association at the same time seems to provide the opportunity for the traditional "middlemen" to further expand their operations.

Dollah's marketing channels were not much different from that before the implementation of the project. The rice marketing channels with FA participation would look like Figure 3.4.

The final buyers for the FA paddy were the government owned rice mills (National Rice and Paddy Board). Dollah would have received higher prices for his rice crop if no agents were appointed by the FA, but he would have to deliver the paddy to the mills himself. The price for a *pikol* (1/16 of a ton) of paddy in 1972 was set by the Paddy Board at M\$17. FAs were expected to buy paddy at this regulated price. FAs bought Dollah's paddy through their agents. Dollah was paid M\$15 per *pikol* rather than M\$17. Dollah could very well sell his paddy direct to the Paddy Board at M\$17.

Do farmers have more employment opportunities on the farm? Our typical farmer, Dollah, raised only one crop of rice per year before the implementation of the project. His family labor was adequate to meet the on-farm labor requirements. Dollah might utilize his excess labor on nonfarm employment if there were jobs available in his village. If there were no alternative employment for his labor, he would be idle for about six months in a year. Kemubu farms were very small and the demand for hired labor was limited.

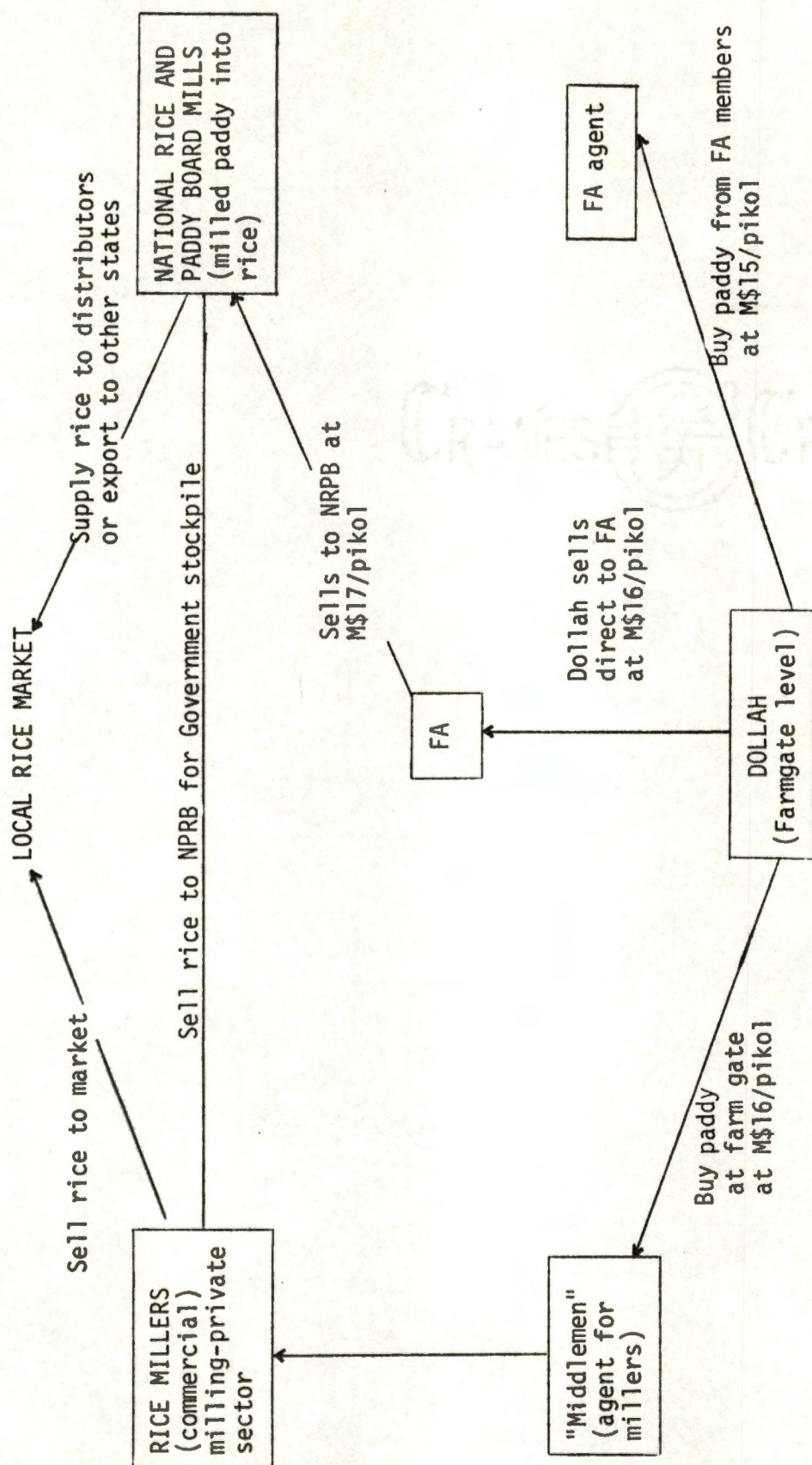


Figure 3.4. Paddy marketing channels in Kemubu.

The introduction of the rice double cropping increased demand for labor for transplanting and harvesting on most farms. In addition, rice double cropping called for the conversion from the traditional dry nursery seedbed to a wet nursery seedbed. Wet nursery seedbeds demanded more intensive labor and care from the time seeds were sown to the time when seedlings were ready to be transferred to the field for transplanting. The new rice varieties called for a short growing period in the seedbed, 20 to 25 day-old seedlings. Good and healthy seedlings would ensure additional yield returns to farmers.

On the whole, farmers were willing to use hired labor, since the potential crops to be harvested would be larger than before the project. Research in the Philippines concluded that 4 percent more labor per ton was employed with high yielding varieties than with traditional native varieties.⁵

An IRRI sample study of two FAs in the Kemubu project on the changes in the use of family and hired labor with the adoption of rice double cropping reported substantial employment gains.⁶ The results of the study showed that 50 percent of the farmers in the Salor and Meranti area reported increased use of both family and hired labor (Table 3.1). There

⁵William H. Bartsch, *Employment and Technology Choice in Asian Agriculture* (New York: Praeger Publishers, 1977), p. 25.

⁶Moktar Tamin and N. Hashim Mustpha, "Kelantan, West Malaysia," in IRRI, *Changes in Rice Farming in Selected Areas of Asia* (Los Banos, Philippines, 1975), pp. 201-223. Further interpretation of this and other aspects of this study are provided in more recent IRRI report. See *IRRI Interpretative Analysis of Selected Papers from Changes in Rice Farming in Selected Areas of Asia* (Los Banos, Philippines, 1978).

Table 3.1. Reported Change Over Five Years in Family and Hired Labor Use in Kemubu, 280 Farmers Interviewed by IRRI, 1971

	Use of Family Labor		Use of Hired Labor	
	Increased	Did Not Change	Increased	Did Not Change
	----- percent of farmers interviewed -----			
<u>Salor area</u>				
Nursery	76	23	39	55
Land preparation	34	37	73	27
Transplanting	70	27	48	50
Harvesting	56	42	40	52
<u>Meranti area</u>				
Nursery	77	21	13	76
Land preparation	8	3	84	15
Transplanting	90	9	10	77
Harvesting	79	18	25	62

Source: Mokhtar Tamin and N. Hashim Mustapha, "Kelantan, West Malaysia," in IRRI, *Changes in Rice Farming in Selected Areas of Asia* (Los Banos, Philippines, 1975), p. 216.

were substantial increases in the use of family labor for nursery, transplanting and harvesting operations (Figure 3.5).

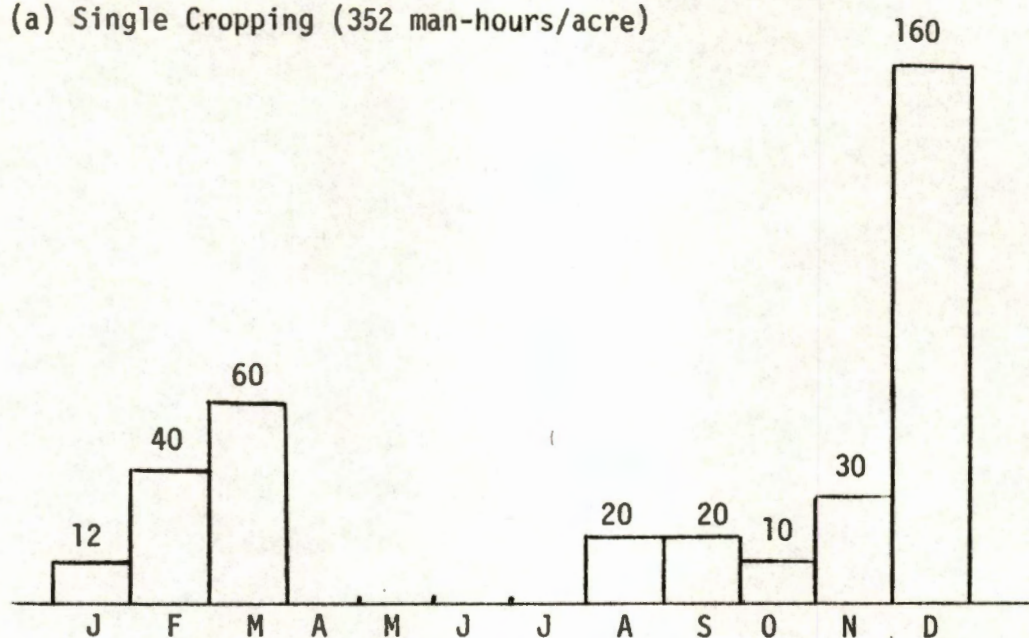
E. WHAT CHANGES IN INCOME HAS THE TYPICAL FARMER
SEEN SINCE THE BEGINNING OF THE PROJECT?

In this study a comparative analysis of the farm income and employment situations for "before" and "after" the project were simulated. Since rice double cropping was introduced in Kelantan several years before the Kemubu project was implemented, the 1967 crop year was chosen as the base year for the purpose of the comparative budget analysis in this study. The "before" situation included two crop years, 1967 crop year (single cropping) and 1970 (the beginning of rice double cropping in KADA). For the "after" situation--the implementation of the Kemubu project--the 1976 crop year was chosen.

Separate budgets for tenant and owner farms were used. This seemed reasonable because of the substantial population of tenant farms in the project and the prevailing crop-share renting system which tended to be unduly favorable for owner farmers.⁷

⁷T. B. Wilson, *The Economics of Paddy Production in Northern Malaya* (Kuala Lumpur: Ministry of Agriculture, 1958). The share cropping-system, which was the prevailing practice among the Kelantan rice paddy cultivators, may be explained as a form of risk sharing under uncertainties. For tenants, there was always the risk of eviction from the landlords. From the viewpoint of the landlord, it was to his advantage not to have written legal contracts, all being verbal. If poor harvest by the tenant during any season reflects poor crop husbandry practices and management, the landlord may exercise his option to deny the present tenant from working his land in the coming season. Therefore, tenants seek to improve the level of management practices so that their tenure on the farms is continuous.

(a) Single Cropping (352 man-hours/acre)



(b) Double Cropping (803 man-hours/acre)

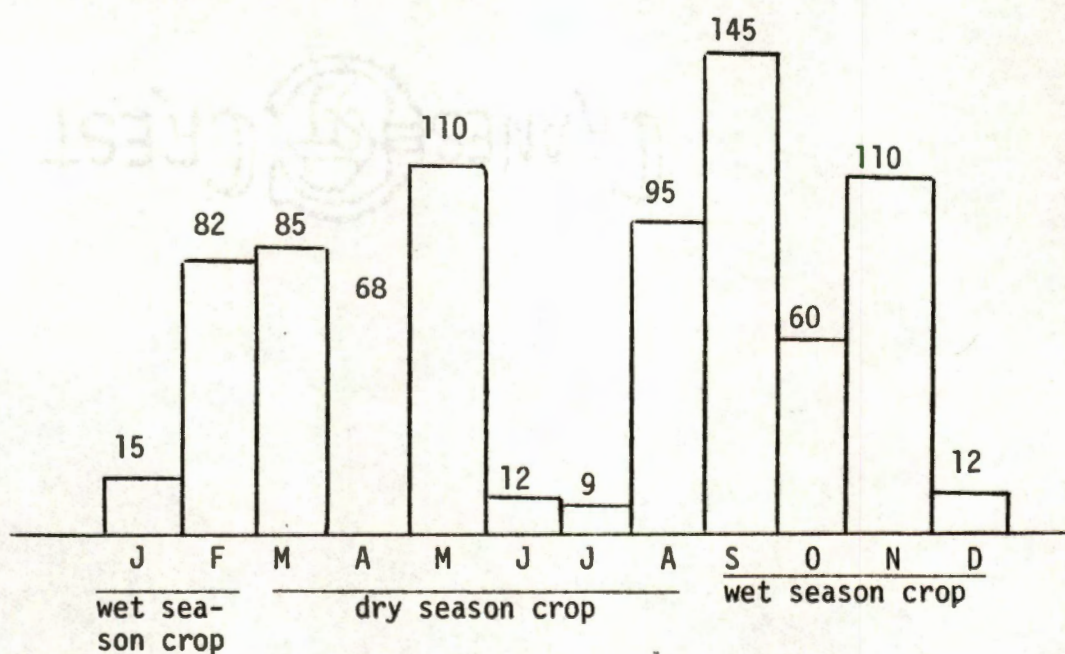


Figure 3.5. Utilization of labor for single cropping paddy (1967) and double cropping (1976) in man-hours per acre.

Budgets for the typical Kemubu tenant and owner farms for the 1967, 1970 and 1976 situations were developed to evaluate and to monitor the project impacts seen by the typical Kemubu farmers thus far. Input prices and rice paddy prices were all assumed to be at the 1976 M\$ level.

According to these budgets, net returns for tenant farms have changed from M\$115 in 1967 (Table 3.2), when the area was under single rice cropping, to M\$202 in 1970 (Table 3.3) at the beginning of the Kemubu project. Similarly, the net returns for a typical owner-farmer in Kemubu in 1967, prior to the rice double cropping in Kelantan, was only M\$437 (Table 3.2) compared with the net returns from owner-farmers operating 2.2 acre farms, of M\$1,112 (Table 3.4) in 1970. However, the implementation of Kemubu rice double cropping programs increased the net returns further to M\$300 (Table 3.5). After the implementation of Kemubu, owner-farmers' net returns increased to M\$1,439 (Table 3.6).

This was a substantial expansion in net income indeed. The income of a typical tenant farm in Kemubu increased by M\$87 when rice double cropping replaced the single traditional one season rice paddy.⁸ The

⁸The traditional rice paddy production or rainfed rice production is geared mainly to the prevailing monsoon rains. Nurseries are prepared in late July through August. Due to the lack of water supply, 80 percent of farmers use dry nurseries. Field cultivation is undertaken in August-September, using buffalo or power tillers. The crop is transplanted in September and October. Native varieties, maturing anywhere from 150 to 180 days are used. Even under the traditional technology and agronomic practices, farmers do use some fertilizers and chemicals on the farm. The difference between the traditional native varieties of rice and the rice hybrid seeds, such as those produced by IRRI at Los Banos, Philippines, is that hybrid seeds are more responsive to nitrogen fertilizer applications. The traditional Malaysian rice seeds are less responsive to nitrogen applications.

Table 3.2. Farm Budget for Typical Tenant and Owner Farms Before the Project (1967), at 1976 Prices

	Tenant Farmer	Owner Farmer
1. Rice paddy area (acres)	2.20	2.20
2. Family size (no. of people)	5.10	5.10
3. Cost of production (M\$)	209.14	212.44
a. Seeds ^a		
b. Land preparation ^b		
c. Fertilizers ^c		
d. Hired labor ^d		
e. Land tax ^e		
4. Gross returns at GMP price of M\$416/ton ^f	324.48	648.96
5. Net returns to the farmer	115.34	436.52

^aSeeds valued at M\$1.04 per gantang. The total cost for 8 gantangs of seeds is M\$16.64.

^bAssumed to use power-tillers at the rate of M\$3.50/hour, and it takes 5 hours to complete ploughing an acre of paddy land. The total cost is M\$38.50.

^cAssumed the rate of 30 kilograms of fertilizer per acre (66 pounds of N) at M\$1.88/kilogram. The total cost is M\$124.00.

^dThe total hours of hired labor used is 90.06 hours, 18 percent of the total labor demand per acre. The hourly wage rate is M\$0.15. The total cost is M\$30.00.

^eLand tax at M\$3.30 per year on 2.2 acre farm is paid by the landowner.

^fThe yield per acre is 0.71 ton.

Table 3.3. Farm Budget for a Typical Tenant Farm in Kemubu at the Beginning of the Project (1970), at 1976 Prices

	Dry Season	Wet Season	Annual
1. Acres cropped	2.20	2.20	4.40
2. Family size (no. of people)	5.10	5.10	5.10
3. Cost of production (M\$)	355.55	355.55	711.10
a. Seeds ^a			
b. Land preparation ^b			
c. Fertilizers ^c			
d. Hired labor ^d			
4. Gross returns with rice paddy price at M\$ 416/ton ^e	484.64	428.48	913.12
5. Net returns to the farmer	129.09	72.93	202.02

^aCost of seeds M\$9.15.

^bCost of land preparation at M\$27/acre is M\$59.40.

^cCost of fertilizer at the rate of 132 pounds of N/acre is M\$248.00.

^dCost of hired labor at 118.24 hours/acre is M\$39.00.

^eRice yield (tons/acre) 1.06 ton for dry season and 0.94 ton for wet season.

Table 3.4. Farm Budget for a Typical Owner Farm in Kemubu at the Beginning of the Project (1970), at 1976 Prices

	Dry Season	Wet Season	Annual
1. Acres cropped	2.20	2.20	4.40
2. Family size (no. of people)	5.10	5.10	5.10
3. Cost of production (M\$)	327.20	357.20	714.40
a. Seeds ^a			
b. Land preparation ^b			
c. Fertilizers ^c			
d. Hired labor ^d			
e. Land tax ^e			
4. Gross returns with rice paddy price at M\$4.6/ton ^f	969.28	856.96	1,826.24
5. Net returns for the farmer	612.08	499.76	1,111.84

^aCost of seeds M\$9.15.

^bCost of land ploughing M\$59.40.

^cCost of fertilizer at N:132 pounds/acre is M\$248.00.

^dCost of hired labor at 118.24 hours/acre is M\$39.00.

^eLand tax on 2.2 acres is M\$3.30 per year.

^fRice yield (tons/acre) 1.06 ton for dry season and 0.94 ton for wet season.

Table 3.5. Farm Budget for a Typical Tenant Farm in Kemubu After the Implementation of the Project (1976), at 1976 Prices

	Dry Season	Wet Season	Annual
1. Acres cropped	2.20	2.20	4.40
2. Family size (no. of people)	5.10	5.10	5.10
3. Cost of production (M\$)	420.77	420.77	841.54
a. Seeds ^a			
b. Land preparation ^b			
c. Fertilizers ^c			
d. Hired labor ^d			
4. Gross returns with rice paddy price at M\$416/ton ^e	580.32	561.60	1,141.92
5. Net returns to the farmer	159.55	140.83	300.38

^aCost of seeds M\$9.15.

^bCost of land ploughing is M\$59.40.

^cCost of fertilizer at N:165 pounds/acre is M\$310.20.

^dCost of hired labor at 127.34 hours/acre is M\$42.02.

^eRice yield (tons/acre) 1.27 ton for dry season and 1.23 ton for wet season.

Table 3.6. Farm Budget for a Typical Owner Farm in Kemubu After the Implementation of the Project (1976), at 1976 Prices

	Dry Season	Wet Season	Annual
1. Acres cropped	2.20	2.20	4.40
2. Family size (No. of people)	5.10	5.10	5.10
3. Cost of production (M\$)	422.42	422.42	844.84
a. Seeds ^a			
b. Land preparation ^b			
c. Fertilizers ^c			
d. Hired labor ^d			
e. Land tax ^e			
4. Gross returns with rice paddy price at M\$416/ton ^f	1,160.64	1,123.20	2,283.84
5. Net returns to the farmer	738.22	700.78	1,439.00

^aCost of seeds M\$9.15.

^bCost of ploughing land is M\$59.40.

^cCost of fertilizers at N:165 pounds/acre is M\$310.20.

^dCost of hired labor at 127.43 hours/acre is M\$42.02.

^eLand tax on 2.2 acres is M\$3.30 per year.

^fRice yield (tons/acre) 1.27 ton for dry season and 1.23 ton for wet season.

implementation of Kemubu rice double cropping in 1972, expanded the net returns by another M\$100. Double cropping, and the associated development into modern irrigated rice paddy farming, produced net income gains of more than M\$180 per tenant farm in Kemubu. The net increase in farm income between 1967 and 1976 was more than 160 percent.

How did this income gain compare with the benefits accrued to owner-farmers in the project? Owner farmers in Kemubu made up 58 percent of the total farm families in the project area in 1976. This group of farmers was cultivating 50 percent of the project rice paddy farms. Table 3.2 showed that the typical owner farmer's net returns were M\$437 in 1967 with the traditional mono-crop agriculture. With the introduction of rice double cropping, the net farm income was M\$1,112. This represented an additional return of M\$675, while tenant farmers earned a net increase of only M\$87. (See Tables 3.2 to 3.4.)

The large differential in net income gains between the tenant and owner farmers in the project was largely due to the rent factor. Tenant farmers have traditionally paid rent at the rate of one-half the total harvested crop yield. They have paid all the costs of seed, land preparation, fertilizer and hired labor, but have kept half of the rice output. Under the traditional technology and farm practices, yields were low. Tenant farmers have paid a small amount in rent relative to the total cost of production per acre. But as we see from Tables 3.2, 3.3 and 3.5, the land owners have gained much more than the tenant as improved practices have been adopted.

	<u>1967</u>	<u>1970</u>	<u>1976</u>
Value of rice kept by tenant on 2.2 acres (M\$)	324	913	1,142
Total operating costs paid by tenant	209	711	841
Net return to tenant	115	202	300
Value of rice paid to landowner	324	913	1,142

The typical owner's net income increased by more than M\$1,000 between the pre-project year, 1967, and after the implementation of Kemubu, in 1976. Net income of owner farmer increased by M\$675 (between 1967 and 1970) an increase of 154 percent. Between 1970 to 1976, the owner farmer's net income increased by M\$328 per farm. This was a 29 percent increase in net incomes for owner farmers.

There are two reasons for low tenant returns--(1) the rental percent and (2) input cost not shared by landowner. Under this arrangement, tenant has no incentive to farm intensively.

An ideal crop-share system should be based on the marginal value product of the resources which the tenant and the landowner contributes. The idea is for the landowner and tenant to share the cost of improved practices in the same proportion as they are sharing returns (sharing the paddy harvest). If the landowner receives 50 percent of the paddy harvest, then he would be paying 50 percent of the total input cost (seed, fertilizer, hired labor).⁹

⁹For more about how such sharing creates incentives for both landowner and tenant to adopt improved practices to the same degree see Earl O. Heady, *Economics of Agricultural Production and Resource Use*, (New York: Prentice-Hall, Inc., 1952), pp. 587-621. A simpler explanation can be found in C. E. Bishop and W. D. Toussaint, *Introduction to Agricultural Economic Analysis* (New York: John Wiley and Sons, Inc., 1958), pp. 153-162.

In Malaysia the Paddy Cultivators--Rent and Security of Tenure Act, 1967, specified the rent for paddy farmland at M\$189 per acre.¹⁰ If one allows for 7 percent inflation per year for the 1970-76 period and the rent ceiling were increased accordingly, the cash rent that the Kemubu farmers would pay would compare with the traditional share rent as follows:

	<u>1967</u>	<u>1970</u>	<u>1976</u>
Acres cropped	2.2	4.4	4.4
Assumed cash rent per acre M\$	189	189	284
Total cash rent that tenant would pay M\$	415	831	1,249
Crop-share (50:50), value of paid by tenant M\$	324	913	1,142
Cash rent as percent of crop-share M\$	128%	91%	109%

We can see that tenants in Kemubu were paying rents to landowners in excess of the amount determined by the government. If the Act is enforced, tenants would be paying less rent and increase returns. But it could also have the effect of discouraging landowners from renting out; they might tend to operate their own farm. By encouraging rental

¹⁰ During the 1960's price levels in Malaysia did not increase much, but there has been considerable price inflation during the 1970's. The 7 percent inflation factor is the rate reported in *World Bank Report, 1978* (The World Bank, Washington, D. C., August 1978), p. 77.

In actual fact, the official cash rent ceiling is still M\$189. Cash renting is very uncommon in Kelantan. Nearly all the renting is on 50-50 crop share basis.

For more about the Rent and Security of Tenure Act, see Eldon Smith and P. R. Goethals, "Tenancy Among Paddy Cultivators in Malaysia" (Kuala Lumpur: Ministry of Agriculture, February 1967). (Mimeographed.)

arrangements, in which both landlord and tenant share in the cost as described above, the government could be more successful in increasing production and tenants incomes than by imposing a cash ceiling.

F. WHAT CHANGES IN EMPLOYMENT HAS THE TYPICAL FARMER SEEN
SINCE THE BEGINNING OF THE PROJECT?

There has been an increase in the labor inputs expended on the typical farm in Kemubu. In 1968, it was reported that the average labor input requirement per acre on Kemubu farms was 316 hours.¹¹ Eighty-four percent of this total labor demand was supplied by the farmer and his family. Fugimoto¹² reported in his study that farmers in Kubang Sepat FA used 504 hours per acre (Table 3.7). This total labor requirement was for the dry season in 1973 and the number of farm family workers on this 1.83 acre farm was 3.0. An 8-hour day was imputed by Fugimoto for the farmer and 6-hour day for the farmer's wife. Labor availability for the season was assumed at 150 days.

As shown in Table 3.7, the main inputs in rice cultivation are for transplanting and harvesting operations. The rice double cropping technology required 504 hours of labor in 1973, 60 percent more than the total of 316 hours required in 1967 with the traditional technology. The yield per acre in 1967 was 0.71 ton, but in 1973 according to

¹¹S. Selvadurai, *Socio-Economic Survey of Paddy Farms in the Kemubu Area of Kelantan* (Kuala Lumpur: Ministry of Agriculture, 1968), p. 84.

¹²Fugimoto, p. 82.

Table 3.7. Estimate of Labor Inputs for Dry Season Crop, Rice Double Cropping in KADA, 1973

Operations	No. of Hours/acre (hours)	Percent of total labor demand
1. Pre-planting ^a	18	3.40
2. Nursery works	8	1.60
3. Field cultivation	22	4.20
4. Transplanting	250	43.60
5. Post planting works ^b	50	9.80
6. Harvesting	187	37.10
7. Total labor inputs per acre	504	100.00

^aIncludes repairs to broken bunds and water intake channels.

^bIncludes fertilizer applications, water delivery related works, pest control works.

Source: Akimi Fugimoto, Farm Management Case Study of Peasant Rice Farming in Kelantan, M. S. Thesis, University of Malaya, 1975, p. 82 (unpublished).

Fugimoto's study it was 0.73 ton (291 gantangs/acre). This was the overall average of 55 farmers in the study. However, the yield per acre among the different size farms varied from a high of 1.04 tons (418 gantangs) to a low of 0.65 ton (258 gantangs) as shown below:

<u>Size farm/tenure</u>	<u>Yield/acre (gtg.)</u>
Less than 1 acre	418
1 to 2 acres	280
2 to 3 acres	258
3 and above	444
Owner farmers	268
Tenant farmers	250
Owner-tenants	318

In terms of the total labor employment on the farms, one can say that the introduction of rice double cropping provided greater opportunities for the family labor to be employed on rice farms. Sixty percent more labor was used on the rice paddy farm per acre in 1973 under the new technology than under the traditional rice farming technology in 1967.

Kubang Sepat farmers were still undergoing a transformation process from traditional technology to modern farming. Farmers have yet to adjust and adapt to the rigorous and demanding crop scheduling of the multiple cropping system. The 1973 yield reflected the early stage in the transition process of growth and development from mono-cropping to that of the modern multiple cropping rice technology. Therefore, there may be a certain amount of labor inefficiency, as a result of being unfamiliar with rigid water delivery schedules and the new hybrid seeds.

In addition, farmers were in 1973 still adjusting to the new demand of the modern technology under multiple cropping.

In 1971 Huang¹³ carried out a study on allocation efficiency of input use among farmers in three rice growing areas of Malaysia. The areas were (1) Tanjong Karang (Selangor) (2) Province Wellesley (Penang) and (3) Kemubu. According to Huang, rice yields in the first two areas covered in his study were much higher than Kemubu. To see whether allocation efficiencies were different among the three areas, Huang used Cobb-Douglas production function:

$$Y = f(A, V, FL, HL)$$

where

Y = Total production of rice paddy per year

A = Total area cultivated per year

V = Total variable inputs used per year

FL = Total family labor used per year

HL = Total hired labor used per year

He derived the ratio of marginal productivity to opportunity cost (market prices) for the inputs: "If the ratio is greater (less) than unity, more (less) of that input should be used." The ratios were:

	<u>Kemubu</u>	<u>Tanjong Karang</u>	<u>Province Wellesley</u>
A	0.60*	2.66*	1.35
V	2.32**	7.33**	1.92
FL	0.96	0.43*	0.68
H	2.17*	1.61***	0.92

*Significantly different from unity at .05 level.

**Significantly different from unity at .10 level.

***Significantly different from unity at .20 level.

¹³Yukon Huang, "Allocation Efficiency in a Developing Economy in Malaya," *American Journal of Agricultural Economics*, Vol. 53, #3 (August 1971), pp. 514-516.

Huang concluded that inefficiencies were most prevalent in Tanjong Karang and nonexistent in Province Wellesley. The allocation inefficiencies in Tanjong Karang were because the farmers were not using enough variable inputs, hired labor or land. Province Wellesley was considered to be a commercial rice growing area, with more abundant resources and less allocation inefficiency. In Kemubu the allocation inefficiencies in input usage were less than Tanjong Karang.

In the same study Huang used the model:

$$\text{Log (input)} = a + b \log (\text{paddy area cultivated})$$

to examine the intensity of input use with respect to farm size. For all three areas, the b-coefficients were highly significant at the 99 percent level. In Kemubu the elasticity coefficients were all below unity (0.887, 0.839, 0.262 for family labor, variable inputs, hired labor respectively). The implication drawn from these coefficients was that Kemubu farmers did not maintain the intensity of input use as farm size became larger. In Province Wellesley the elasticities for variable inputs and hired labor were very close to unity (1.067 and 1.056) Huang concluded that, given enough time (Province Wellesley was the first rice double cropping area in Malaysia), farmers would adjust to the new technology and maintain it as farm size increases.

In Fugimoto's sample of farmers, the total labor employed on rice paddy farms under multiple cropping was low relative to the total labor inputs available from 3.0 farm family members.

This low intensity of employment by the farm family labor gave an indication of the transitional nature of rice double cropping in the

project. When using traditional technology and using native varieties, yields were very low. Farmers had to look for off-farm jobs to offset the low returns from rice cultivation. In Kemubu, before the introduction of rice double cropping, nonpaddy employment contributed more than 50 percent of the typical farmer's gross income.¹⁴ Yields were very low. In 1968, the sale of paddy by Kemubu farmers was only 6 percent of their harvested crop. In Muda, where farms averaged 4.05 acres, the portion sold was 51 percent. In Kemubu farmers retained 69 percent of their crop for domestic use, while in Muda farmers kept only 32 percent for home consumption.

From the foregoing discussion and the limited data on labor inputs generated on the project farms under rice paddy double cropping, we can say that to some extent rice technology in Kemubu is still in the "transitional stage" of growth and development.

Increased demand of labor will to a large extent be concentrated in land preparation and harvesting the crop. With year-round irrigation, shorter maturation period rice varieties, and reduced sensitivity to time of planting of hybrid seeds, the pattern of employment on rice double cropping farms would be smoothed out as new work and employment opportunities are created in the cultivation of the second crop. The World Bank estimates of the expected labor utilization on the project farms were based largely on the expected reversal of the trend for farmers to reduce their nonpaddy employment jobs. The yields shown in our

¹⁴Yukon Huang, "Some Reflections on Paddy Double Cropping in West Malaysia," in *Malayan Economic Review*, Vol. 17, #1 (1972).

representative farm budgets for 1976 are much higher than what the World Bank predicted. The main nonpaddy activity in Kemubu was the cultivation of tobacco. Tobacco was already a developed enterprise when Kemubu was implemented in 1972. Yields of rice in the project were about 1.23 ton/acre in 1976. Project farmers have become less and less dependent on nonpaddy employment because of better production relative to the preproject years. By 1976, the tobacco area in Kemubu had been greatly reduced as a result of shifts of tobacco growing onto nonproject farms.¹⁵

We may argue that, with the tobacco crop no longer forming a major source of nonpaddy income, project farmers may have increased their family labor employment on their paddy farms. This was evidently so if we observed that rice paddy yields on Kemubu farms have increased. Rice paddy prices have also increased in recent years relative to the previous years. We would envisage more returns to family labor. The World Bank projection of the labor utilization and wage rates for Kemubu showed an upward trend in labor demands on Kemubu farms.

G. SUMMARY

In summary, one can say that the "transitional stage" of moving from traditional rice farming to one of modern rice paddy commercialized

¹⁵Relocation occurs basically due to two reasons: (1) It is affected by the irrigation system; i.e., in areas where farmers prefer tobacco instead of rice farming during dry season crop, delivery of irrigation water to nearby areas will be less efficient or even impossible. Tobacco farmers do not want their crop to be inundated with the irrigation water. (2) The rapid expansion of the tobacco crop in Kelantan in the 1970's resulted in the production of low quality tobacco leaves. This was reflected in the prices paid to growers.

farming has almost been completed for Kemubu farmers. Net farm incomes have improved for the typical farmer--especially for owner-farmers. But, for the almost 50 percent of the project farmers who were tenant-farmers, the current net income levels were yet very unsatisfactory because of the high rents paid by them and the fact that added input costs have not been shared by landowners.

Farm employment on the project farms indicated a trend towards more intensive labor use on each farm. This was reflected in the current increases in outputs per acre, compared to outputs before the project. In addition, along with this trend in labor utilization, there was probably a decline in the nonpaddy employment jobs, a reverse pattern of employment norms. Traditionally, before the project, Kemubu farmers were well known for their nonpaddy employment activities. Improved rice paddy production on Kemubu farms have brought about the change in employment patterns.

CHAPTER IV

THE KEMUBU PROJECT AS A MANAGEMENT ENTITY

A. INTRODUCTION

In this chapter the following questions related to the effectiveness of the KADA Authority as an implementation vehicle will be described:

1. What have been the project's experiences in funding its programs? Have the appropriated funds been adequate? Has the organization had adequate staff resources?

2. How effective have KADA's programs been? Has it had trouble meeting the goals and objectives of both the state and federal authorities? Have there been constraints that have prevented the project organization from carrying out its functions successfully? What have been the relationships between KADA and other agencies (such as FOA, MARDI, DOA, DID and the National Rice and Paddy Board) that are supposed to provide technical and program support in the KADA area.

3. Finally, how effective have the linkages with the local farmers been?

As we have seen in Chapter II, the KADA Authority's activities are based on priorities determined by both the state and federal governments. The project management organization has obtained technical and program support from other agencies. The policy view underlying this arrangement was the belief in coordinated effort by all agencies working toward the goal of making multiple cropping and rice production in KADA a success.

This chapter would give some insights into the constraints and the operational effectiveness of the Project Authority's organization and management. In doing so it is not possible to provide concrete documentation. The observations that follow are based in large part on the author's personal experiences and observations as Agricultural Division head with the Kemubu project during the 1970-1975 period.

B. HAS KEMUBU RECEIVED ADEQUATE FUNDING?

The KADA Authority receives budgetary appropriations from the Federal Treasury. The total operating budget--mainly (1) staff salaries for the three divisions of the Authority, Administration, Agriculture and Engineering, and (2) fuel costs--was M\$1.42 million in 1973. In 1976 the allocation was M\$5.16 million.

The staff strength was at the level of 628 persons in 1974, with a large number in the Engineering Division. Between 1974 and 1976 the increase in the total staff was very small. There were fewer than 10 professionals staff and 40 sub-professionals among the 628 in 1974. The rest were clerical and supervisory staff.

	<u>1974</u>	<u>1976</u>
	----staff number----	
Administration	22	26
Agriculture	78	93
Engineering	528	534
Total	628	653

KADA's organizational structure has not had research and technical backup. The staff in the Agriculture Division was mainly to supply the extension coverage in the project. The FA system was the grass-roots

organization adopted to assist extension work and other programs (credit, marketing, tractor service and input supply) in the project.

The funding to support the basic extension needs for implementing the delivery and use of the irrigation water, as well as providing the normal level of extension help, seemed adequate.

In Malaysia, the provision of agricultural extension service is vested with the state governments. The formation of the Authority meant that the legal responsibility would be transferred from the state to the federal government. It facilitates the funding of the project, since the Kelantan government is poor financially.

Have the funds been adequate to support Kemubu's programs? The situation has been satisfactory so far as funds that were directly funded to operate Kemubu facilities, such as the irrigation systems. However, KADA has depended on other agencies to finance and operate such programs as credit, paddy marketing, etc. Credit programs have been funded from resources available at the Agricultural Bank and paddy marketing operations from the Farmers Organization Authority (FOA) via the FAs. Technical support came from the Crop Production Division of DOA and from MARDI. Since these agencies have nationwide responsibilities, the intensity of their activities within Kemubu very much depends on the total appropriations these support agencies receive from the federal treasury.

In practice, the Muda project has overshadowed Kemubu and, hence, to some extent limit these agencies' capacities to service KADA. The World Bank completion report on Kemubu in 1975 has indicated thus:¹

¹World Bank, op cit. Annex 4, p. 3.

KADA has been deliberately modelled on The Muda Agricultural Development Authority (MADA) but it has not yet achieved the interdisciplinary integration characteristic of MADA or the thrust of the latter in bringing about technological change.

Similarly, the tractor service program has not until recently been budgeted under KADA's funds. It was only in 1976 that the KADA FAs received appropriations for tractor and transport services. An amount of M\$125,000 was provided that year to help the FA buy tractors and trucks.

We might argue that there was no proper planning by the project Authority to determine farmers' needs for credit, marketing and input supply services. No budget was requested from the government for such programs when the project was implemented. The basic assumption was that, once the FAs were instituted, the FA business activities (input supplies and rice paddy marketing) would generate sufficient funds to operate the credit program.

Another reason for lack of special funding for credit services is the existence of the Agricultural Bank Malaysia (ABM). The ABM was organized with the objective of providing short term loans to rice paddy farmers in Malaysia. When the program was implemented in 1970, there were no long range plans as to what portion of farmers could benefit from the credit program each year. The credit program has been described in Chapter III, where we found that local results were far from satisfactory.

C. HAVE KEMUBU'S PROGRAMS BEEN CONSISTENT WITH OBJECTIVES IN BOTH STATE AND FEDERAL AUTHORITIES?

To some extent, KADA has been able to function within the framework and goals set for the project. We have to consider the constraints with

which the management personnel of the Kemubu project have to cope with in the process of transforming the agricultural patterns within the project area. First, as we have seen in Chapter III, the rate of adoption of multiple cropping during the implementation years has been slow. We have attributed this slow pace to the "transitional stage" Kemubu farmers were still in during the early 1970's. However, concerning the basic policy objective of introducing multiple cropping system and creating new farm employment potentials for farmers, the project management personnel can be said to have accomplished some target goals.

Why were the target goals of *rapid increases* in productivity not achieved? Many reasons may be put forward to account for the shortfall in production:

1. Inadequate research efforts on seed production.
2. High factor cost of production.
3. Low rice paddy prices.
4. Unregulated illegal rice mills (small mills produce low quality milled rice) and the tendency of the National Rice and Paddy Marketing Board to over regulate the export of rice from Kelantan.
5. Mediocre expertise in rice marketing by FA staff.
6. Credit policy of the Agricultural Bank Malaysia--overly strict lending requirements.

These factors have not necessarily originated from the Kemubu management office. But these problems have had ramifications for programs carried out in the project area. Table 4.1 identifies sources of the interagency conflict and the dimensions of such conflicts as they evolved

Table 4.1. Observed Conflicts Between Kemubu and Other Supporting Agencies About Issues That Have Contributed to Low Performance of Multiple Cropping

Problems	Agency	Reasons	Underlying conflicts that have impeded progress
A. Technical Issues			
1. Inadequate research efforts and seed production	State DOA Crop production/MARDI	Seed testing not adequately tested (Bahagia)	Seed production not managed by KADA Staff lack developmental attitude Staff has no identity with KADA in terms of goals and developmental perspectives
2. High factor cost	State DOA/MARDI	Uneconomic to use fertilizer Fertilizer recommendations have no correlation with soil types Outdated recommendation	Incompetency in research approach Lack the economics of production High yielding seed is what matters
B. Administrative/Policy Issues			
1. Low paddy prices in the project	National Paddy Board ^a	Lack of big rice mills ^b Many small mills that are inefficient in converting paddy to rice ^c Restricted rice export from Kelantan FA staff lack expertise in marketing	Paddy Board very rigid on moisture content paddy sold No technical assistance available to small rice millers Strict policing of rice export by Paddy Board; quantity of export limited. FAs suffer because of wide market margins set by Paddy Board.
2. Inadequate production credit	Agricultural Bank/ Farmers Associations	Cumbersome loan procedure Staff overworked Credit tied to marketing (farmers who receive credit sell paddy to FA)	Loan application have to be made well in advance of the season FA staff feel they carry too much risk FAs have to absorb losses on market margins made by buyers FOA too concerned with FA involvement in rice marketing

^aNational Rice and Paddy Board owns 3 rice mills in Kelantan.

^bNational Cooperatives Union, Kelantan owns 2 smaller mills.

^cThere are approximately more than 500 illegal small rice mills in Kelantan.

within the project. This tabulation is based on personal observations of the writer during the 1970-1975 period.

Research efforts on seed production. Successful multiple cropping depends on availability of tested seeds and the adaptability of such seeds to the local environment such as the soil types. Kemubu obtained its main supply of seeds for distribution to project farmers from the State Crop Production Service. Administratively, this section should work closely with the Malaysian Agricultural and Development Institute (MARDI), whose functions are to carry out all basic research programs in the country.

The development of a suitable and adaptable rice variety is a case in point of the kind of basic research that would be the main role of MARDI. The research facilities in Kelantan were small compared to the experimental and testing units at MADA. The tendency has been to transfer what was best for MADA to Kemubu. A clear case was the local hybrid seed, *Bahagia*. Since this seed performed well under MADA conditions, the contention of MARDI officials was that it should perform about the same in Kemubu.

But Kemubu soils are lighter and inherently nutrient-deficient. *Bahagia* does not grow well in Kemubu without adequate fertilizer application. The higher fertilizer cost in Kelantan has made it irrational for farmers to use as much fertilizer with *Bahagia* seeds as recommended by MARDI.

This raises the next problem of uneconomic levels of fertilizer recommended by the research agency for use by the project farmers. In

Kemubu, a general recommendation of fertilizer for rice was adopted in the days of single cropping (in the early 1960's). At the start of the project, this recommendation was not changed. The fertilizer recommendation was suitable for the traditional native rice seeds. Hence, the same fertilizer use with the "Green Revolution" seeds would fail to yield the potential output growth expected from multiple cropping programs.

Lack of identity of research agency with KADA's developmental roles. These above problems were technical in nature. They imposed considerable constraint on the Kemubu management in terms of its capacity to increase the rate of development in the project. They developed into inter-agency conflicts when the poor performance of *Bahagia* seeds on farmers' fields became the subject of discussion at the KADA Board meetings and among farmers.

According to one development administration expert, Saul Katz,² an organization designed to carry out specific development programs cannot function if some essential elements are absent. (For example, a transportation facility may be missing from the marketing activity, or the experiment station might have no relation with the extension service.) In Kemubu, the research station has not had an accommodating relationship with the project functions and KADA's developmental aspirations. If such

²Saul M. Katz, "Striving for the Heavenly Society: The Tactics of Development" (CEDA Lectures, Kathmandu, Nepal, 1974, Pittsburg, Pa.: University of Pittsburg, Graduate School of Public and International Affairs), pp. 54-57.

conflicts between the Kemubu management personnel and the research staff continue, future progress is likely to be very slow.

In terms of early administrative and policy issues that have affected the success of multiple cropping in KADA, the sources of conflicts were more distinct. These conflicts occurred both within and outside the project management entity. They stemmed in large part from pressures by project farmers' for production credit and for higher product prices at the farm level. In Chapter II, we have seen that the grass-roots organization upon which the project was built is the FA system. The FAs are part of the KADA Authority, but they were legally constituted under the Farmers Organization Authority Act, 1974 (FOA). Hence, the FAs in Kemubu also received their administrative guidance from the FOA. FOA wants FAs to increase the volume of business operations.

The credit program. Project farmers who were members could apply for production credit from their respective FAs. The source of credit fund was the Agricultural Bank Malaysia, whose functions are nationwide. The rate of growth of credit distributed by FAs between 1970 through 1975 was:³

<u>Year</u>	<u>Value of Credit (M\$)</u>
1970	69,000
1971	160,000
1972	227,000
1973	355,000
1974	620,000
1975	947,000

³KADA *Statistical Digest 1970-1975* (Kemubu Agricultural and Development Authority, October 1976), p. 10.

This represented a substantial annual increase in credit given out. However, only a small number of eligible farm families in each year were fortunate enough to get credit. The budget for the typical farmer in Kemubu (Chapter III) indicated that the input cost for fertilizer alone would have amounted to M\$496 in 1970 and M\$620 per farm for a typical farmer. If the total amount of credit disbursed in 1970 were divided in this manner, only 138 farm families who needed credit would get it. Similarly, assuming that the fertilizer input cost for our typical farm was about the same in 1975 as in the 1976 budget, this would mean only 1,526 farm families would have received ABM credit. The total number of farm families in Kemubu was 45,000.

During 1971-1975 the actual amount of credit disbursed by the Agricultural Bank to the FA system was:⁴

<u>Year</u>	<u>No. of farmers in the program</u>	<u>Percent of all farmers in the project</u>	<u>Amount of credit per farmer (M\$)</u>
1971	1,045	2	69.00
1972	3,026	6	65.00
1973	2,608	5	74.00
1974	6,525	14	90.00
1975	7,844	17	110.00

The Kemubu management, the Agricultural Bank and FOA all recognized the importance of credit in the project. However, procedural problems associated with the application of credit as specified by the Agricultural Bank tended to overwork the skeleton staff at the association offices.

⁴Ibid.

Unrecovered credit repayments by the end of each crop season imposed constraints on the FAs. The local associations have to absorb the bad loans. This created a drain on the limited capital assets of the association. To the Kemubu management and the staff of the associations, the risk in giving credit was very high. On top of that, the FOA management recommended that the FAs' credit activities should include marketing services too.

Farmers association staff were new to the area of marketing. They lacked the technical know-how to compete with the traditional paddy buyers, who act as agents for the local rice millers. There were also several farmers associations who buy paddy from farmers through appointed agents. The appointed buying agents with accumulated experience in marketing have the tendency to exploit the situation by paying farmers lower prices.

We have mentioned the fact that farmers also have their reasons for not wanting to use credit (Chapter III). There is still a certain amount of conservatism in their attitudes toward risk. The risk was high for small farmers who operate tenant farms. They would be risking the loss of their crop if they borrow funds. Since incomes were low, farmers were reluctant to take such risks.

Procedural specifications in credit applications were also a problem. The World Bank completion report on Kemubu made the following observation on the agricultural bank lending procedure:⁵

⁵World Bank, op. cit. Annex 3, p. 14.

There was a two or three month waiting period from application to receipt of coupons, . . . the farmer would exchange coupons for goods or services with registered stockists [farmers associations are stockists] but it appears that there were appreciable delays before [the bank] provided cash in exchange for the coupons. This was a particular embarrassment to the FA's since they have limited operating capital and must pay for bulk supplies of fertilizers and chemicals under normal trading terms. . . . There is a time limit for applications and operations of the system for each season, so that farmers cropping out of phase with the system face difficulties.

The report indicated also that by 1975 only 12 percent of the project farmers took credit. The mission report cited two possible reasons for the low utilization rate of credit. One reason was that input supplies available at the associations were often inadequate, because of lack of operating capital. Secondly,⁶

. . . the system of processing loan applications and issues is still too complex and, given the rather restrictive credit worthiness criteria, does not adequately accommodate the needs of the small farmers who need help most.

We can therefore conclude that since KADA does not have the resources to support a credit program of its own, small farmers who need credit fail to receive ABM loan because of the strict loan procedures. Many farmers associations carry out separate nonbank financed credit programs out of their own capital. This was done to service members, who otherwise would not be able to obtain production credit because they did not meet the criteria demanded by the lending agency.

Supporting agencies serving Kemubu were too concerned with their respective functions and roles. The Agricultural Bank wanted to make sure that the credit given out was recovered. The FOA was preoccupied

⁶Ibid.

with creating a viable marketing network of its associations throughout the country. Here we would observe that whenever ideas differ about what the project mission was and how they (supporting agencies) should participate in the project, we could expect difficulties in implementation of some aspects of the development programs in the project.⁷

Rice milling and paddy marketing. The next problem area the Kemubu management entity faced were the low product prices. Paddy prices in Kelantan and everywhere else in Malaysia have been low because of the policy of the government to provide cheap rice to consumers through market price controls. In addition, the low paddy prices in Kelantan have been the result of rice smuggling into Kelantan from Thailand. Prices of rice from Thailand have traditionally been lower than Malaysian prices. Paddy prices received by farmers serve as an inducement to increase investment in factors of production by the project farmers.

The low paddy prices have implications for the low credit utilization rate observed in the project. Initially, the basic management premise in the implementation of the credit program was to make farmers familiar with the need to use production credit as a viable farm management practice toward increasing production. As we have seen, these have not been successfully realized. The FA staff, because of the narrow market margins and sometimes because the associations have to absorb bad loans, feel that the returns from the credit program have been low relative to the risk involved.

⁷AID, *Elements of Project Management* (Development Project Management Centre, USDA/AID, June 1976), p. 86.

Paddy buying in the project area has been regulated by the National Paddy and Rice Board (NPRB). Prices are set by the Board at the guaranteed minimum price (GMP).⁸ The prices set may have been reasonable--paddy prices have increased steadily to about M\$416 per ton by 1976, compared to M\$256 per ton in the 1970 crop year. The Paddy Board up to 1975 had only one big rice mill in the project area. There were two more big mills, both owned and operated by the Kelantan Cooperative Rice Mill Union. In addition, there were more than 500 illegal small rice mills.

The Paddy Board has seemed to practice the system of buying farmers' paddy on discount prices; i.e., deductions on moisture content, grain cleanliness, etc. are made. Hence, the effective price that farmers receive have not been the GMP prices announced by the Board.✓ The NPRB also carried out rigid enforcement on the export of rice from Kelantan to other parts of Malaysia. Strict licensing procedures were imposed by the Board on the export of rice. The net result has been the inherently low paddy prices within the project area.⁹ Kelantan is a rice surplus

⁸ The objective of the Board has been to stabilize rice prices to the majority of the poor consumers (nonrice paddy population). Low farm gate paddy prices would result in lower rice prices in the market for everybody. This has been the practice and the policy of the Malaysian government.

⁹ IBRD, *Kemubu Irrigation Project Malaysia* (March 1967), p. 11. The original project document by the World Bank has made a similar observation way back in 1967:

The farmer does not always receive the full guaranteed price because of deductions made by rice millers for transportation, bagging, moisture content, quality etc., which often reduces the price paid the farmer. . . . The marketing situation is complicated in Kemubu area by the profits possible from smuggling rice across the Thai border into Malaysia and the presence of several hundred small inefficient and illegal rice mills.

state. If there were free flow of rice from Kelantan, it is very likely that project farmers would have been paid higher paddy prices than in the past. Much of the rice produced in the Kemubu project is sold in the local market. Hence, we find the low paddy prices relative to prices farmers pay for inputs and other consumer goods. This is not to say that the basic cause of the low paddy prices was solely a result of the public sector involvement in the rice milling industry. These small mills have a poor recovery rate, the milled rice-paddy grain ratio. As a result, low grade milled rice was produced. The large quantities of low quality milled rice forced the paddy prices in the project area to be very low relative to prices paid for similar grain type to farmers in Muda.

The technical aspect of rice milling is that larger rice mills produce higher paddy-rice ratios (above 65 percent) and less than 5 percent broken grains. Small rice mills obtain 55 to 60 percent paddy-rice ratios and a high percentage of broken grains. The production of good quality milled rice means the possibility of farmers receiving higher paddy prices.

One way that the KADA Authority and the National Paddy Board could raise quality is to work toward improved efficiency of the small rice mills in Kemubu. Through technical help, operators of small mills can be educated to learn what additional returns they can make with efficient milling practices. With some credit assistance, small millers could be encouraged to buy new milling machines to improve the paddy-rice ratios. To eliminate the functioning of these small mills would

mean fewer marketing outlets and lower incomes for some farmers. This could also lower costs and/or better quality rice.

Thus is the dilemma the Keumbu management has had to cope with since the implementation of the project. We can argue that Kemubu in no small way has been successful in increasing the national paddy output but, as we have seen, the small farmers in Kemubu were still not getting the full benefit of their hard work. What was the vision of the World Bank planners in 1967 about Kemubu?¹⁰

The Kemubu farmer, in general, is intelligent and hard working and it can be assumed that he will try to develop the full benefit of irrigation in this area.

We observe that the Kemubu management has had to face several odds--an "incomplete structure," the credit program of the Agricultural Bank and the marketing program of the Paddy Board. Other problems have stemmed from KADA's being dependent on another agency (MARDI) for research support, seeds and recommendations on fertilizer use.

The Kemubu management has experienced problems of adequate linkages, both within and externally. A major problem of linkage relationships among divisions and agencies has been that administrators have not been trained in such skills as interpersonal communication and management techniques. Specifically, they need to have a clear understanding of the kinds of organizational arrangements and administrative styles that would facilitate an effective integrated development program.¹¹

¹⁰ IBRD op. cit., p. 16.

¹¹ Allen D. Jedlicka, *Organization for Rural Development* (New York: Praeger Publishers, 1977), pp. 108-109.

What went wrong with the Kemubu management organization? In the original appraisal report of 1967, there was no reference to any need to coordinate engineering planning with agricultural extension and credit activities.¹² Management in the LDCs is a scarce asset. However, agricultural development involves the dynamic interplay of institutions and innovations. We need institutions to support innovations; farmers cannot adopt the new rice technology within the traditional institutional setup. There was a clear case in Kemubu of the traditional bureaucracy that exists in some institutions or agencies that are patterned on executive powers, rather than development oriented and accommodating.¹³ The Paddy Board to my mind has clearly emphasized the enforcement function of its legislative framework at the expense of not reinforcing projects like Kemubu as much as it might.¹⁴

Administrative issues on KADA personnel. Internally, the KADA management organization has been faced with problems of high turnover of senior staff and calibre of personnel assigned to the project. Many of the staff were young and lack experience. The persistently high

¹²IBRD, op. cit., p. 16.

¹³This may have been the outgrowth of earlier years (British Colonial days) when the main role of civil servants and agriculture was to help the *status quo* and to continue in an orderly manner--not change oriented.

¹⁴The National Rice and Paddy Board functions both to provide the public sector rice milling services and also to regulate paddy and rice prices in Malaysia. Its regulatory power includes the prevention of rice smuggling from Thailand into the country. Since Kelantan is a border state, smuggling activities for some become lucrative. The Paddy Board contention is that the regulated and controlled flow of rice exports from Kelantan will help to stem smuggling from Thailand.

vacancy rate among all staff positions and the large number of personnel holding joint appointments have weakened the administrative capacity:

(1) For example, the General Manager was at one time holding three appointments. Besides being the executive head of KADA, he also has been the State Director of Agriculture, Kelantan and the State Director FOA.

(2) At the offices of the FA, the situation was no better. When the KADA Authority was formed, FOA was also inaugurated. At the start, all the nine FAs in the project were already operational. However, most of the staff were on assignment from the state agriculture office or from the federal office. With the establishment of two new agencies--i.e., KADA and FOA--personnel at the FA offices were given the option to continue their service with the agencies or to return to their parent departments.

(3) Staff remuneration and programs became the crux of the matter for most of the staff. The KADA Authority was directed to recruit from among the existing personnel at the FA office as direct staff of the project. Administrative delays took their course and it was not until early 1976 that the issue of personnel at the FA office was resolved--a new salary structure for KADA staff was implemented.

D. HOW EFFECTIVE HAVE THE LINKAGES WITH THE LOCAL FARMERS BEEN?

We can in general say that operational linkages and lines of communication with farmers have been established. Nevertheless, there were problems which present a certain measure of confusion among local farmers.

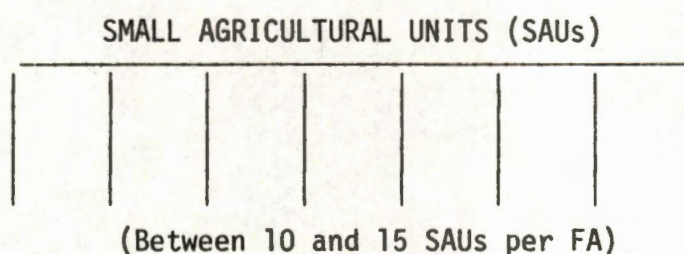
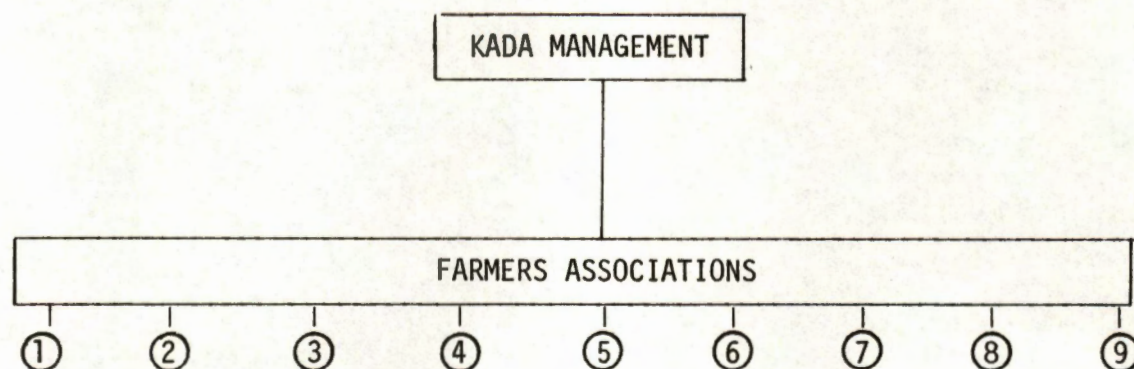
First, the Project Authority has attempted to replace the existing producer organizations, the rural cooperatives, with the more modern developmental institution of FAs. Second, the extension methods and logistics have undergone changes. Traditionally, before the construction of the irrigation systems in the project, the main lines of communication between farmers and change agents were through the village headman. The irrigation ditches divide the traditional villages into smaller sub-villages. Administratively, the village headman finds that the old clustered community has been broken into scattered *kampongs*.

The FA organization consists of the small agricultural units (SAUs) which correspond to the new sub-villages (Figure 4.1). This constitutes a break from the traditional administrative hierarchy of the village authority and point of reference away from the headman. In other words, the FA system attempted to identify and develop leadership from the farmers themselves, to stimulate local group action and to promote the transfusion of modern farming ideas and practices through these farm level groups.

The past mismanagement in the rural cooperatives movement in Malaysia was a reflection of the failure of government to create a viable grass-roots rural organization that can carry the burden of the development process.

Studies of local organizations for rural development in 18 countries by Cornell University¹⁵ showed that, in countries where there were "more

¹⁵ Norman T. Uphoff and M. J. Esman, *Local Organization for Rural Development: Analysis of Asian Experience* (Cornell University, Rural Development Committee Bulletin No. 19, November 1974).



Number of members in FAs, 1976

1. Alor Mas	1,180
2. Cabang Empat	1,590
3. Kubang Bunut	1,000
4. Kubang Sepat	1,400
5. Bukit Jawa	1,300
6. Nilam Puri	1,400
7. Padang Raja	1,200
8. Sir Gunong	1,500
9. Sungei Ketereh	1,300

Figure 4.1. KADA's Farmers Associations (FAs) System and the Small Agricultural Units (SAUs).

organized" farmers organizations, agricultural productivity was on the increase. Malaysia was categorized as having "less organized" local level farmers organizations. The FAs and cooperatives still exist side by side in the same village communities. They do not necessarily overlap in functions but they overlap in spatial activities, causing a profusion of institutional change agencies which confuses farmers. This organizational duplication has given rise to problems of competition for limited budgets, leadership conflicts and confusion in the geographical area of operations. If the FAs and cooperatives were to compete for the limited resources of government, neither would be likely to have enough funds to effectively bring about needed changes for the target clientele.

In the Kemubu experience, the meeting of the minds between the project manager and the farmer can best be seen in the area of tractor use. Mechanization of land preparation operations has increased rapidly in the project area. During some seasons, shortages of tractor services for ploughing rice fields became acute in some areas of the project, as a result of the inadequate number of available tractors on the farm. The Department of Agriculture (DOA) began conducting training programs for farmers in farm mechanization. Among the trainees many were FA members. With the knowledge acquired, these members discussed the possibility of their FA to venture into the provision of tractor custom services for the members. Soon their elected leaders were able to give the idea a thorough investment evaluation at the levels of both the SAU and the FA board of directors. The FA staff and KADA management provided the necessary technical guidance and economic analysis for a successful farm mechanization service.

To start with, Kubang Sepat FA agreed to invest in three tractors in 1974. Members of the FA who had the necessary skill were selected and employed by the association as tractor drivers. The FA staff provided assistance in the work scheduling and the financial aspects of the tractor custom service. The response and the demand from the members were very encouraging. Members were delighted at the capacity of their FA to provide them with tractor service, an essential input in the multiple cropping program. This successful undertaking suggests what can be accomplished through interaction between farmer--members and FA managements, and involvement of both groups in decision-making processes.

This is a clear example also of how the FA structure has provided clientele with improved ability to respond to new opportunities. Farmers have become aware of the benefits of tractor service. This is the out-growth of the training program organized jointly by the FA/DOA on farm mechanization. Farmers who attended the training program arrived at a consensus that it would be desirable to invest in tractors.

There were nine tractors, owned by the Kemubu FA's in 1974. By 1975 the number increased to 25 units.¹⁶ Kubang Sepat owned five tractors in 1975, and the net return from its tractor operation was almost M\$11,000 for the year. For the whole of KADA, with 25 tractors, the net return was M\$45,774 in the same year. It was very encouraging to realize that this successful program was the result of participatory group dynamics between farmers at the local level and the project management personnel.

¹⁶ KADA *Statistical Digest 1970-1975* (Kemubu Agricultural and Development Authority, October 1976).

In 1976, this tractor service program earned a net return of M\$62,844, almost a 40 percent increase compared to 1975 earnings.¹⁷

An important salient characteristic of the FA system lies in the provision for separation of management from policy making. Policies are in the hands of members, through their elected representatives, while management is the job of the staff assigned to the FAs. The practical experience of the tractor investments by the FAs demonstrates how the "grass-root" character of the association has been reinforced by the FA management.

The introduction of the FAs often came with pampering in an effort to increase allegiance to the FAs. In Kemubu, as well as in other parts of Malaysia, to facilitate rapid identification of farmers with the newly established FAs, an office was built in each FA area--the Farm Development Centre. This was different from the traditional cooperative set-up for which no local office or staff had been provided by the implementing agency.

The small agricultural units (SAUs) which form the FA administrative constituents still do not include all farmers in the locality. The SAUs through their elected leaders are in constant communication with the staff at the local FA office. The elected SAU leaders are in one sense para-statal change agents. Therefore, the SAUs form the basis for group articulation of problems of special interest to farmers in the area. The SAU leaders are closely identified with the local farmers.

¹⁷KADA *Statistical Digest* 1976 (Kemubu Agricultural and Development Authority, August 1977).

They are often no better off in terms of wealth and status than their neighbors.

In Kulp's program system framework we can say that FA management has provided the essential linkages in the total development strategy. The farmers associations have facilitated the "client systems" participation in the "program systems."¹⁸

What have been the relationships between management and nonmembers of Farmers Associations? One might get the impression that nonmembers were being ignored by the management. By design, nonmembers do not receive the benefits of such programs as credit or tractor services. However, to minimize the burden on nonmembers, FAs do not necessarily ignore them entirely. Nonmembers still can buy inputs from the FA stores, and still receive extension help. But the shortage of personnel at the FA offices reduces the capacity of change agents to service nonmembers effectively. The management has taken this fact into careful consideration. The number and intensity of extension agents will be increased with the current implementation of the Extension Component of the North Kelantan Rural Development Project.¹⁹

¹⁸Kulp, op. cit.

¹⁹World Bank, *Malaysia Appraisal of the North Kelantan Rural Development Project* (Report No. 1137-MA, April 1976).

The extension component would develop a state "grass roots" extension service to service all farmers in the state, whether they be in areas currently served by KADA, or outside. In the first phase, effort would be largely concentrated on paddy and groundnut. [The main component emphasis include] the formation of farmer groups 25-40 based on Small Agricultural Units or irrigation outlets, with one farmer leader per ten farmers. Each group would receive visits from the [extension agent] once every two weeks on a systematic basis.

This program was begun in Kemubu in 1976. The problem of the extension system was not only the large number of farmers to be served, but also what Whyte termed as the "social distance gap."²⁰ Whyte's point is that, in the United States, the county agent would be dealing with farmers not much different from the agent in education and social status. However, in most LDC's, the status gap between the farmer and the agent would be far greater. Attempts to bridge this gap with more intensive extension coverage or the use of para-statal leaders (such as elected SAU leaders) would be among the kinds of strategies that can bring about more effective implementation of planned development programs.

Derauh's²¹ social study of the Kemubu farmers associations supports Whyte's contention that the "social distance gap" occurs as a result of low educational levels of farmers in LDC's:

. . . that the level of education is positively associated with participation. . . . the higher the education of a farmer the greater the likelihood that he will also have a higher level of participation. For example, among farmers with a higher level of formal education (4 years or more) 54.9 percent scored high on participation compared to only 23.1 per cent of those with low formal education (less than 1 year).

²⁰William F. Whyte, *Organizing for Agricultural Development* (New Brunswick, N. J.: Transaction Inc., 1975), p. 43.

²¹Harun Derauh, "Membership Participation, Organizational Performance and Developmental Change: A Comparative Study of Selected Farmers Associations in West Malaysia" (a Ph.D. dissertation presented to the University of Kentucky, Lexington, Kentucky, 1976), pp. 96-97.

E. SOME ADDITIONAL OBSERVATIONS

KADA, which was established to implement the Kemubu project, has embodied several innovations. One of these innovations was to break away from the traditional administrative elite pattern and, instead, to emphasize close links with, and involvement of, farmers. The traditional reliance on village headmen to reach farmers was discontinued and, through farmers associations, the focus was on smaller groups--the Smaller Agricultural Units. The SAU leadership, with the constant support from the trained FA staff have provided a new vehicle for the spread of modern agricultural practices among project farmers. A collective responsibility was created to facilitate interactions between the program and the client systems, and to lend support to project management.

A fact which has to be recognized is that, in spite of the constraints and the high turnover of staff vacancies during the first five years of project implementation, a break with the traditional institutions has been made (the rural cooperatives and the village headmen). Also clear support of the separation of policy and management functions was seen in the farmers' decision to invest in tractors for land ploughing.

As far as interagency linkages are concerned, the KADA authority has been less successful. The reasons are varied, but the main factor has been the lack of identity with the planned programs of the project by the supporting agencies. This has been attributed to the weakness in interpersonnel interactions between staff of the various agencies.

One word of reminder: the accomplishment and potential of the KADA management as an agency responsible for development should be examined

on the basis of its own task setting, rather than being compared with the bigger organization at MADA.

CHAPTER V

KEMUBU IN THE CONTEXT OF NATIONAL DEVELOPMENT

A. INTRODUCTION

The Kemubu project is a program aimed towards the economic growth and development of the poorer states of Malaysia. In this chapter, the relationship of the project to national development will be examined as it bears upon:

1. Food production policies.
2. Rice production structure.
3. Rice import substitution.
4. Patterns of rural on-farm employment.
5. The means to reduce rural poverty (especially among the poorer paddy farmers).

Such questions as the following come to mind: In terms of output goals, has the project helped to meet the national demand for more rice production? What has Kemubu meant in the overall context of Malaysia's rice production policies?

What kind of aggregate impacts has the Kemubu project produced thus far?

1. Have the gains in rice production in KADA been sufficient to offset the country's annual rice imports?

2. What has been the aggregate contribution of KADA toward the creation of rural on-farm employment? What changes in on-farm employment have been seen in the project area: Has the on-farm employment creation helped to reduce the rural-urban population shifts?

3. What have been the aggregate income effects?

4. Has the project been able to reduce the poverty problem among the project farmers?

B. HAS THE PROJECT HELPED TO INCREASE FOOD PRODUCTION?

Paddy production in Kemubu grew from 92,000 tons in 1970 to 124,560 tons in 1975 (Table 5.1). The increased output resulted from both acreage expansion and increases in the average yield per acre. In 1970 the total area harvested was 95,459 acres, the cumulative total for both the dry and wet seasons' acreages. By 1975 the cumulative acreage was 120,300 acres, a 26 percent increase over the 1970 harvested acreage.

The growth rate of paddy output in the project between 1970 and 1975 was comparable to the trends in the national growth rates. The productivity index for KADA was more impressive in 1976. During that year the cumulative harvested acreage was 105,000 acres. The total paddy output was 131,435 tons and the productivity index of 141 was much higher than during the previous five years. The 1976 productivity index was 40 percent above the base year of 1970.

The yield per harvested acre was 1.06 ton at the beginning of rice double-cropping, 1970, but by 1975 paddy output per acre increased by 5 percent to 1.12 tons (Table 5.2). The average yield for the 1972 dry season crop was the highest during the 6 year period, 1970-1976. It was 465 gantangs per acre, almost 1.16 tons.

In Table 5.3. KADA's rice production in terms of milled-rice equivalent is compared with the national output for 1970-1976.

Table 5.1. Kemubu Paddy Production, Milled Rice Equivalent, and Productivity Index, 1970-1976

Year	Area harvested (acres)	Paddy production (tons)	Milled rice (tons)	Productivity index ^a KADA Malaysia (1970=100)
1971	92,949	81,933	52,437	88
1972	120,244	120,034	76,821	129
1973	117,035	111,751	71,520	120
1974	130,635	125,835	80,534	135
1975	120,313	124,561	79,719	134
1976	105,018	131,585	84,214	141

^aThe productivity index refers to the paddy production. The base year is 1970=100.

Source: "KADA Statistical Digest 1970-1975 (Kemubu Agricultural Development Authority, Mimeographed); *Third Malaysia Plan 1976-1980* (Kuala Lumpur: The Government Printer, 1975).

Table 5.2. Yields of Paddy in KADA and Comparisons with Yields in MADA, 1970-1976

Year	Paddy Yield in Kemubu			Paddy yield in MADA annual total ^a
	Dry season	Wet season	Annual total	
	----- (tons/acre) -----			
1970	1.06	0.95	0.97	1.51
1971	1.14	0.83	0.88	1.53
1972	1.16	0.91	0.99	1.57
1973	0.99	0.93	0.95	1.60
1974	1.09	0.87	0.96	1.64
1975	1.12	0.97	1.04	1.67
1976	1.27	1.23	1.25	1.88

^aAffifudin Haji Omar, "Peasants, Institutions, And Development in Malaysia: The Political Economy of Development In The Muda Region" (a Ph.D. dissertation presented to Cornell University, May 1978), p. 253 (Unpublished).

Source: "KADA Statistical Digest, 1970-1975 and 1976" (Kemubu Agricultural Development Authority, Mimeographed).

Table 5.3. KADA's Milled-Rice Equivalent as Percent of Malaysia's Output, 1970-1976

Year	Milled rice output (thousands of tons)		Output in KADA as percent of Malaysian total
	In Malaysia	In KADA	
1970	1,088	59	5.4
1971	1,164	53	4.5
1972	1,193	77	6.4
1973	1,281	72	5.6
1974	1,333	81	6.0
1975	1,264	80	6.3
1976	1,333	84	6.3

Source: *Financial Report 1976/1977* (Kuala Lumpur: Ministry of Finance, 1976, Appendix (Table 8.1)).

Based on the per capita rice consumption of 0.13 ton per person,¹ Kemubu's 1976 production could support approximately 647,000 consumers. Kelantan had a population of 792,000 in 1975.²

The total rice production in Kelantan was:

¹Calculated from *Paddy Statistics, Peninsular Malaysia, 1971 and 1973* (Kuala Lumpur: Ministry of Agriculture).

²*Third Malaysia Plan*, op. cit. p. 208.

	108
Output from KADA area (105,000) acres	84,118
Output from Non-KADA area (80,000 acres of single cropping)	48,880
Total Kelantan output	132,998
Total consumption	102,960
Total surplus rice	29,958

There was a surplus of 30,000 tons of milled-rice in Kelantan. This surplus could be made available to the deficient rice consuming areas in Malaysia. The surplus was larger than 30,000 tons if the smuggled rice from Thailand was added to this volume.

How important is this surplus rice in Kelantan? Malaysia's average annual net imports of rice have been about 150,000 tons. The surplus rice in Kelantan came mainly from the increases in output from the KADA area. The surplus was equal to about 20 percent of the annual net imports of rice.

The achievements of the Kemubu project have been the result of rapid adoption of multiple cropping. Goldman's study of the Malaysian rice policy and programs in 1975 showed:³

In virtually every area where the new varieties and the provision of dry-season water present an opportunity to increase net returns to farm enterprise, the double-cropping has been adopted with minimum delay. Significant resistance has occurred only in areas where the second paddy crop displaced a higher valued activity. These instances are rare and include tobacco production in parts of the Kemubu Scheme. The production of rice is undoubtedly price responsive in Malaysia. Malaysia's successful development of infrastructure and the adoption of "Green Revolution" technology are impressive. Gains in production however, have been the result of a broad strategy of import substitution aimed at both self-sufficiency and more equitable income distribution.

³Richard H. Goldman, "Staple Food Self-Sufficiency and The Distributive Impact of Malaysian Rice Policy," *Food Research Institute Studies*, XIV, No. 3 (1975), pp. 267-269.

C. HOW HAS THE PROJECT HELPED TO CREATE RURAL EMPLOYMENT AND
REDUCE FARM-URBAN POPULATION SHIFTS?

In Kemubu the trend has been for labor to be bid away from the tobacco enterprise. We have mentioned in Chapter III that the tobacco enterprise no longer forms the major source of nonpaddy employment. Employment opportunities for the landless and tenant farmers in the project have greatly expanded with the introduction of multiple cropping programs. Although there is no evidence as to the proportion of landless farmers in KADA it could be large. We may assume that tenant farmers in the project are landless. There are more than 20 percent tenant farmers in the project. In Muda, landless farmers made up only 8 percent of all farm families in the project.⁴ Landless farmers have acquired considerable incomes from wage earnings from other farms. This kind of project spin-off--i.e., the demands for hired labor--have been on the increase in the project.

A comparative analysis of the changes in on-farm employment in the project was developed (Table 5.4). Under single cropping (1967) the total family labor required per acre was 316 man-hours. The estimated level of farm unemployment was a high of 73 percent. The introduction of rice double cropping (1970) increased the labor input requirements to 650 man-hours. The estimated level of unemployment was reduced to 36 percent. In 1976 the level of unemployment was at 10 percent.

⁴Affifudin Haji Omar, "Peasants, Institutions, and Development In Malaysia: The Political Economy of Development In the Muda Region," (a Ph.D. dissertation presented to Cornell University, May 1978), p. 253 (unpublished).

Table 5.4. Aggregate Labor Utilization on Kemubu Farms

	1967	1970	1976
Total family labor supply on the typical farm (man-hours per year)	4,200	4,200	4,200
Total labor supply in Kemubu, assuming 45,000 families and 22,500 Labor units ('000 man-hours)	94,500	94,500	94,500
Labor requirements per acre (man-hours)	316	650	804
Total harvested areas (acres)	80,000 (single)	92,400 (multiple)	105,000 (multiple)
Total labor utilization in Kemubu ('000 man-hours)	25,280	60,060	84,420
Total labor unemployed ('000 man-hours)	69,220	34,449	10,080
Total equivalent unemployment in labor units	16,480	8,200	2,400
Percent farm families unemployed	73	36	10

Without multiple cropping, farm family labor would for the most part be seasonally unemployed.⁵ To a considerable extent, the Kemubu project has been successful in reducing rural-urban migration. We could infer this change from the substantial reduction in the unemployment level in the project. During 1971-1974, unemployment in the rural areas of Malaysia declined from 17.7 percent in 1971 to 11.6 percent in 1974.⁶ The largest reduction in unemployment was reported within the agricultural sector where the proportion of labor force working less than 25 hours a week declined from 20 percent to 15 percent. The trend in the improvement of employment opportunities in the agricultural sector would support our estimated improvements in the unemployment situation on the project farms as the aggregate impact of the project programs.

Purcal's⁷ study of unemployment and income in rice double cropping villages in Province Wellesley during the 1960's tended to support the estimated reduction in the level of on-farm unemployment developed in present study as a result of the implementation of multiple cropping.

⁵Before the introduction of rice double cropping in Kelantan, several thousand farmers from Kelantan would travel 300 miles to Muda during the paddy harvest. (Harvesting of the wet season crop in Muda is during the months of January and February and harvesting of the wet season crop in Kemubu begins in late March and goes through until the end of April.) This seasonal migration of Kelantan farmers was reduced substantially after the early 1970's when rice double cropping in Kemubu was expanded rapidly.

⁶An underemployed person person was defined as one working less than 25 hours per week. *Third Malaysia Plan*, p. 141.

⁷John T. Purcal, *Rice Economy Employment and Income in Malaysia* (Honolulu: The University Press of Hawaii, 1972), p. 132.

His conclusion was:

In the paddy sector, the impressive increase in double cropping has reduced underemployment in the areas which have been newly introduced to double cropping. Given the pattern of labor utilization in the areas, as revealed by this study, . . . there would be considerable reduction in underemployment in those areas which would be brought into double cropping.

D. HAS THE PROJECT ENHANCED FARMERS' INCOME AND REDUCED RURAL POVERTY?

We have seen in Chapter III the comparative net returns attained by the typical owner-farmer in Kemubu as a result of multiple cropping. His estimated net returns were M\$1,112 per farm. This was equivalent to M\$93 per month. His gross return was M\$2,284 in 1976. This means that his monthly household income was M\$190. How would this income level compare with the mean monthly household income in the nation?

In Malaysia the discrepancy between the income levels of rural and urban families has been wide:⁸

The problem of poverty being concentrated in the rural areas among the Malays . . . its redressal will progressively narrow current income imbalances between them. One measure of the difference in income levels between the racial groups in the country in 1970 is afforded by a comparison of mean household incomes in Peninsula Malaysia. Taking all poor households together, the Malay accounted for 74% of the total followed by Chinese 17%, Indian 8% and other about 1%.

The mean monthly household incomes in 1970 for the various sectors were:⁹

⁸*Third Malaysia Plan*, op. cit., pp. 178-179.

⁹*Ibid.*

Rural sector	M\$200 per month
Urban sector	M\$428 per month
Malaysia	M\$264 per month
Kemubu	M\$190 per month

After utilizing irrigation and multiple cropping our typical farmer in Kemubu was earning 5 percent less than the mean monthly income of the rural families and 28 percent below the national level of M\$264.

In 1970, farmers in the project earned a gross income of M\$1,826. The mean monthly household income was M\$152. This income level of the typical Kemubu family was equivalent to about 76 percent of Malaysian rural sector's mean monthly income in 1970. In terms of the national average of M\$264, Kemubu farm family income of M\$152 was only 57 percent of the national average.

Between 1970-1975 the proportion of the paddy households in the "poverty group" in Malaysia decreased by 11 percent; it was 77 percent in 1975 and 88 percent in 1970.¹⁰ This improvement was, in part, a result of higher paddy prices received by farmers during that period. Paddy prices rose by almost 75 percent between 1970 and 1975.¹¹

The Malaysian rice policies have been dominated by emphasis on increasing rice production in order:

1. To increase the overall food supply.
2. To achieve self-sufficiency in rice production.
3. To improve the returns to rice paddy farmers.

¹⁰Ibid., p. 172.

¹¹Ibid.

Item 3 in the rice policy program became more pronounced in 1970's because of the problem of poverty among the rural population. The Malaysian poverty irradiation programs hoped to reduce the incidence of poverty among paddy farmers:¹²

To reduce the incidence of poverty in the rural areas throughout the country among paddy cultivators, rubber small holders. . . by (i) expanding employment opportunities through new land development, establishment of new growth centres and the absorption of excess labor in other sectors of the economy; (ii) enhancing the productive role of the rural poor by increasing their access to land, supplies, credit, markets, extension advice.

In Kemubu the first two objectives within the rice policy may have been met with some measure of success. The output from Kemubu was about 40 percent higher in 1976 than in 1970.

Farm incomes per household during the 1970-1976 period showed a positive improvement. Farmers growing the new hybrid seeds have made some income gains associated with the new technology, but not as much as would be possible. We may suggest two important variables that can help to improve the present income level:

1. Seeds that are better adapted to the Kemubu soils. ✓
2. Larger farm size.

Yields in Kemubu could be much higher than now if there were intensive research toward producing reasonably improved seeds as those available in the Muda project. (Development of new varieties or the local testing of new varieties are already available from MARDI and IRRI.)

Given the fact that the Kemubu soils and available technologies are not the best, we might be justified if we assumed only an 18 percent

¹²Ibid., p. 49.

increase in yield for Kemubu within the next five years.

What Would the Gross Income for Kemubu Farmers be at a Higher Production Level?

Estimates based on the following assumptions are shown in Table 5.5:

1. The production cost and the labor input requirements were assumed to remain the same as the farmers' budget for 1976.
2. The yield per acre was increased by 18 percent (to 1.5 tons/acre) from the 1976 level (1.27 tons/acre).
3. The paddy price of M\$416/ton was considered to continue into the future.
4. Farm size adjustment was considered a feasible way to reduce the existing number of uneconomic holdings (i.e., some farmers could be encouraged to move to new settlement areas).

Income per farmer would increase by 115 percent with farm adjustment program. In the absence of any farm adjustment and at the higher output level the farmer would earn an 18 percent increase in gross income.

What Has Been the Aggregate Impact on Income of Kemubu Farmers?

The aggregate changes in the gross income earned by the KADA farmers were:

	<u>1967</u>	<u>1970</u>	<u>1976</u>
Gross income per farm (M\$)	650	1,830	2,325
Total income of all project farmers (000M\$)	29,250	82,350	102,825

Table 5.5. Estimated Income for Kemubu Farmers at the Production Level of 1.5 Tons per Acre, 1976 Price Levels

Yield level (tons)	Cropping area (acres)	Total paddy production (tons)	Gross income with paddy at M\$416/ton (M\$)	Net income (M\$)
<u>Without farm size increase</u>				
1.27	4.4	5.59	2,325	1,439
1.50	4.4	6.60	2,745	1,901
<u>With farm size increase</u>				
1.27	8.0	9.6	3,994	2,458
1.50	8.0	12.0	4,992	3,456

The impact of the introduction of rice double cropping in the project has been reflected in the substantial gains in the aggregate farm incomes. Between 1967 and 1970, the total gross farm income gain was about 173 percent. From 1970 to 1976 the income gain was 25 percent.

The aggregate farm income would be higher with the farm adjustment program:

	Gross income per farm family (M\$)	Net income per farm family (M\$)	Aggregate farm income (000M\$)
Without farm size increase	2,325	1,900	105,000
With farm size increase	5,000	3,460	150,000

Farm size expansion in Kemubu would have to be implemented in the near future to increase farm income of Kemubu farmers. An intensive survey of the Kemubu farm was started in 1975 with the view toward considering some farm size adjustments in the future.¹³ A comprehensive land development program would support the relocation of displaced farmers from the Kemubu project as a result of farm size adjustments. There are 217,000 acres of agricultural lands, yet uncultivated, in the southern part of the State of Kelantan. Between 1976 and 1990 the Malaysian government has proposed to develop almost 190,000 acres for land settlement programs in Kelantan:¹⁴

¹³Ibid., p. 303.

¹⁴Ibid., pp. 209-210.

<u>Crops</u>	<u>Acres</u>
Oil palm	32,300
Rubber	116,500
Other crops	39,600
Total	188,400

At 15 acres per settler, these new land development schemes would be able to absorb approximately 12,000 farm families.

A consolidation of paddy holdings to facilitate larger farms and equity in resource ownerships among the rural poor will have substantial impact on income distribution and producer returns. The Kemubu Authority is aware of this economic feasibility and potential, as we have assumed in this analysis. There will be many economic and social adjustments when such relocation programs for the displaced Kemubu farmers will have to take place, if current farm size is to be increased from 2.2 acres to 4 acres. The constraints are undoubtedly immense but, if the objective is to ease poverty among the project farmers, the most desirable option may be to encourage farmers on uneconomic land holdings to relocate. The success of the Kemubu project and how well it can contribute to welfare and income goals in the future will be judged on how well the planners resolve this constraint of uneconomic size farms.

What Would the Mean Monthly Household Income be with Farm Adjustment Program?

Using budget figures for 1976 price levels, the mean monthly income of a project farmer can be estimated to be:

	Mean monthly household income (M\$)	
	<u>Gross income</u>	<u>Net income</u>
Kemubu		
(8 acres 1.27 tons/acre, 1976)	333	205
(8 acres 1.50 tons/acre, 1976)	416	288
Malaysia (1976) ¹⁵	396	
Rural	300	
Urban	642	

With an increase of farm size from 2.2 acres to 4 acres, the mean monthly household income of farmers in the project was estimated to increase by 118 percent. The gross income per month for 1976 in the project was M\$190. Even at the 1.2 ton/acre yield, the estimated income was M\$333. This would be 75 percent above the 1976 income.

The estimated income of M\$416 was above the national average and was almost at par with the mean monthly household income for the urban sector.

E. SUMMARY

Growth rate of paddy output has increased at par with the national trends. In fact, in 1972 Kemubu's productivity index was 129 compared to Malaysia's 110 for the same year. By 1976, the output growth was 40 percent above the base year, 1970.

¹⁵ Calculated on the basis of the mean monthly household income for 1970 (as in *Third Malaysia Plan*) multiplied on annual inflation factor of 7.0 percent. (This inflation factor is reported by the *World Bank Report*, 1978 (The World Bank, Washington, D. C., August 1978), p. 77.)

The total production from Kemubu of 84,000 tons milled rice equivalent in 1976 was approximately 46 percent of Malaysia's net imports of rice annually.

Gains in rural employment have been good. The changes in on-farm employment since 1967 have been substantial. In 1967, 73 percent of the total labor supply available on the project farms were unemployed. With the implementation of multiple cropping program unemployment was reduced to 10 percent in 1976. Kemubu farmers made up 13 percent of all paddy farmers in the country. The intensity of multiple cropping in KADA and the increased utilization of labor on project farms have helped to reduce unemployment substantially in the project area.

At the 1976 income levels obtained by project farmers, the mean monthly household income was M\$190. This income level was low relative to the national average of M\$264 in 1970. In this study we have proposed a farm adjustment program to provide for larger farm size. We have assumed a higher output level (1.5 tons/acre) and cropping area of 8 acres per farm family. The larger farm and higher production level could increase the mean monthly income of project farmers to M\$416. This estimated income level would narrow the income gap between farmers and urban wage earners.

The KADA Authority has recognized that paddy holding consolidation program would have considerable impact on income distributions and producer returns.

CHAPTER VI

SUMMARY AND IMPLICATIONS

A. A RECAPITULATION

The basic framework of this study was in the area of agricultural program development and its implementation. The Kemubu project, a World Bank sponsored irrigation project to increase rice production in Malaysia, was used as an illustrative example.

The author's involvement in the implementation of the project during the 1970-1975 period provided the basis for detailed examination of Kemubu from three standpoints:

1. The effects of the project on individual farmers.
2. The project itself as a management entity with needs to link to other organizations at national, state and local levels.
3. The aggregate effects of the project, in terms of rice production, farmers' incomes, employment and other national development concerns.

Concepts and empirical analyses from the field of development administration served as a point of departure for examining Kemubu. Lessons learned from agricultural projects in other LDCs were drawn upon to help delineate possible success and failure elements.

By 1976 Kemubu had provided some payoffs in terms of expanding rice output in Malaysia. But the initial economic impacts of the Kemubu project were far from satisfactory. There was no radical redistribution of income as a result of the project and the introduction of multiple cropping. As seen in Chapter III, the seasonal pattern of labor utilization

on rice farms was undergoing changes and farm employment opportunities were improving to a limited extent as an outgrowth of the spread of double cropping practices. It was observed that the absolute income differentials between tenants and owner farmers had become larger as a result of rice double cropping.

The last situation reflected the prevailing crop share system of land renting among rice farmers in the project. Land owners seemed to be the main local beneficiaries of the project. The larger area in multiple cropping provided landlords with increased rental returns. The project therefore created windfall gains for landlords and accentuated further the income differentials between tenant and owner farmers. The benefits from the project in the form of higher rental cost were captured mainly by the landed class.

A positive solution to the above problem has been included in the Third Malaysia plan 1976-1980. A large land settlement program has been planned in Kelantan. It was envisaged that substantial relocation of paddy farmers in KADA would have to be carried out to ease the disadvantaged tenant farmers from their plight. In this study (Chapter V) we have attempted to show that larger farms (cropping area of 8 acres) would provide income returns to farmers well above the poverty income level.

The KADA experience in the context of the national development perspectives and its policy environment has given rise to some basic dilemmas of decision making. Irrigation development and the rice programs in Malaysia have had two objectives. First, the implementation project

like KADA was aimed at meeting the goal of increasing rice production and producing cheap rice for consumers. Second, the policy was aimed at giving rice farmers the opportunity to obtain higher incomes from paddy farming. The Kemubu experience suggests that the rice policy benefited a large portion of nonpoverty group at the expense of the paddy farmers (tenant farmers). The continued practice of this policy could result in direct conflict between the production and income redistribution goals of the policy. We have observed in this study that producers have been faced with low paddy prices relative to the rising input costs. We have seen in the project that higher input levels were necessary to go along with the modern technology of multiple cropping.

We have pointed out that rice farmers were responsive to higher paddy prices. The grain shortage in the world during 1973/1974 years demonstrated this responsiveness. The Guaranteed Minimum Price (GMP) price for paddy in Malaysia was set at M\$416 per ton. The Paddy Board was purchasing paddy from farmers at M\$416 during the 1976 and 1977 seasons. The higher rice price had a substantial impact on the spread of double cropping and the use of fertilizer by Kemubu farmers. Yields per acre during the 1977 dry season crop averaged 520 gantangs (1.3 tons)--the highest up to that time seen in Kemubu. The average yield could have been higher if the factor-product price relationships that prevailed in the project were not imposing serious production constraints. We have referred to the higher fertilizer prices in Kemubu relative to prices of fertilizer in other paddy areas of Malaysia. The credit program was far from satisfactory from the standpoint of meeting farmers' production credit requirements. Similarly, the paddy marketing program implemented

by the Paddy Board seemed too concerned with meeting the agency's overhead cost. Farmers were paid a few percentage points below the GMP price.

The implementation of the Kemubu project sought to provide farmers with higher returns from paddy farming. However, the rice policy adopted by the Government of Malaysia was at the same time aimed at supplying cheaper rice to urban consumers. This was in direct conflict with the production and income goals. The failure of this policy to satisfy the probable demands for higher rural incomes has been demonstrated.

The means to achieve the income goal was beyond the rice policy and the administrative capacity of the KADA Authority. The author would be inclined to argue that the income issue would have to be resolved within the nonpaddy farm sector. We have recommended in this study the need for farm size adjustments within KADA to allow for larger farms. The KADA management can plan and carry out farm consolidation programs when off-farm employment opportunities and the relocation of farmers owning uneconomic holdings in the project are made available. ✓

The project has established a vital linkage between the program system and the client system--the FAs. The project management cannot be held responsible for the failure to attain goals where the inputs for success should have been provided from other sources. Future programs relating to rural farm income policy should take due cognition of lessons learned from the Kemubu experiences.

It would be irrational if a political judgement were made that the Kemubu project was unsuccessful because it did not meet the goal of increasing the incomes of the poor farmers. Within the Malaysian

political milieu there always has been political pressure to produce instant solutions to problems involving not only the provision of infrastructures (irrigation systems) but also human development. There are temptations to abort programs that do not yield results within the short time span allowed by political expediency. The Kemubu management should resist such attempts if the project is to complete the slow incremental process of fulfilling the planned goals.

In the area of project organization and management, the KADA experience showed the linkages with supporting agencies were not the best. Part of the weakness grew out of the conviction that what was good for Muda (a widely known earlier scheme in Malaysia) bears duplication in Kemubu. The situation stemmed from the organization model that KADA adopted--the Muda model. In Muda the leadership calibre of the management staff was very commendable. The national planners had their vision of how a large rice development program should function to serve the nation's best interest. Every effort towards making Muda the show piece of government programs was provided.

Kemubu had to start with "second rate" conditions. A clear case in point was the less than pure seeds distributed to Kemubu farmers. The result was that yield which farmers obtained were below the potential experimental yield. We have explored the reasons for this situation in Kemubu (Chapter V).

A major flaw in management was the prevailing top-down approach. The agencies supporting KADA--among others, the Crop Production Section of the Federal Department of Agriculture and the Malaysian Agricultural

Research and Development Institute--were concentrating their efforts on Muda both in terms of staff strength and facilities. These agencies would just transfer whatever research findings they had from the Muda area to Kemubu. But the Kemubu soils and farmers would not necessarily be the same as in Muda. Seeds that are suitable on Muda soils perform differently in Kemubu. The agro-techno-economic factors are different. The constraints faced by the Kemubu project were not similar to what the situations in Muda were.

At the farm level the KADA management has successfully established the FAs. The programs carried by the FAs received considerable support from local farmers. The FA Management has identified with and been accepted by local farmers.

The credit program was less satisfactory. The FAs and KADA management cannot be held responsible for the limited utilization of credit by farmers in the project. The staff at the FAs were overworked, and their work loads were made even heavier by the procedural problems in loan applications imposed by the Agricultural Bank.

Membership of FAs was reported to be low. This was to be expected, given the fact that the FA system was a new local institution among the project farmers. In addition, the FA system was supposed to serve as the new local outlet for extension services. The traditional extension services were centered around the village headman. The FA staff had to overcome tremendous odds during the initial phases of forming the FA system and revamping extension.

The question of local acceptance or integration into the community was important to FAs because their future development depended on support

from local farmers. Understanding of the basic elements of the FA system could very well be a function of the educational level among project farmers. We have cited Derauh's study of the Kemubu FAs which concluded that the level of formal education was a positive influence on farmers' participation rates in the FA organization.

Another factor that could have serious implications for the future growth of the FA system in KADA's agricultural development was the displaced focus on what the FA services should be. The Farmers Organization Authority was inclined to measure and evaluate the success of each FA by the volume of credit, paddy marketing and sales of fertilizers the association was able to undertake during the year. Because of the acute shortage of personnel at each FA, the extension work was very much neglected. The FA staff were tied down to the backlogs of office work--the recording of sales and accounting entries to keep pace with the daily business transactions. The work was made even more difficult because some of the staff were inadequately trained to handle record keeping and accounting needs of FA financing procedures. Hence, little time was left for FA staff to get involved with farmers' problems in the field. Farmers too were kept busy. They had to stay on their farms during the crop season and tended to make infrequent trips to the FA office for extension assistance.

We have seen that the overall effectiveness of the FA system depended upon effective organization at the SAU level--the village level. At this level the needs and interests of farmers would be adequately articulated and communicated to local FA personnel. In the Kemubu project the success of the SAU leadership in playing an effective role has been

demonstrated. A case in point was the tractor service (Chapter IV).

The SAU leadership provided what Kulp meant by the "interaction between institutions and innovations" to bring about agricultural development. We would regard the *FA model* as a *new innovation* in the rural setting of the Kemubu farmers which enhanced their capacities to participate in multiple cropping. The transition in rice technology from the traditional subsistence agriculture to the modern multiple cropping was supported and reinforced by the *new institution*--the *FA system*. We have established the fact that within a short span of time KADA management was able to become identified with the project farmers through the establishment of FAs in the project area. KADA had a good start at the grass roots level with the SAU leaders functioning well serving as para-statal agents between management and farmers.

We have established in this study that the organization and management of the KADA project has had a certain measure of success in terms of rice output. Yields have increased but as of 1976 were still very much below potential levels and growth rates. The project farmers have made very good use of the irrigation water made available by the project.

Introduction of the FA system in the project has brought added incentive to farmers. Farmers realized that the FA structure provided them with improved ability to respond to new opportunities. Through the FAs, the farmers were becoming more aware of available services and what the Kemubu project meant for them. This provided the basis for project farmers to develop new skills and translate development aids into productive uses.

In the future, there will be an urgent need for KADA management to examine the programs carried out by FAs with a view toward effectively reaching the remaining 60 percent of the farmers who are still nonmembers. The future growth of the project very much depends on how soon nonmembers can be brought into the FA system.

The Kemubu Authority should in the future play a pivotal role in bringing about closer linkages between the project aims and the functions of other agencies serving the project. This would mean that efforts by research agencies supporting KADA's programs should be reasonably adequate (in terms of staff assignments and facilities located in the project area) to deal with the ongoing research problems/issues that were raised in Chapter III.

The usefulness of the Kemubu project in terms of rice production should continue to be very good in future. Rice output should steadily expand under the stimulus of further improvements in bringing about more efficient use of the irrigation water resource. The prospect for obtaining higher output per unit area should be within reach and greater effort should be exploited to facilitate the eradication of poverty among rice farmers in the project. This seemed to be the only alternative in the effort to narrow the income gap between the urban rich and the rural poor.

B. BROADER IMPLICATIONS OF THE KEMUBU EXPERIENCE

A very important factor in determining success or failure of projects is the extent of political commitment to projects, along with

existence of a viable and strong grass-roots involvement in project programs to assist management.¹

In the Kemubu experience, grass-roots participation or local involvement by farmers at the SAU level has become identified with KADA's programs of multiple cropping. The introduction of the FA model entails a revamping of the extension services to reach small farmers. We can distinguish between two extension approaches that are embodied in the FA model: (1) technical extension and (2) problem-solving extension.

The FA model provides small farmers with a new institution where local problems on farming are acted on and solved by farmers themselves. The tractor service in KADA is a clear example of problem-solving extension method. The FA staff provide technical support to facilitate local level farmers to solve the shortage of farm power in the project.

FAs provide technical extension to project farmers with new inputs (hybrid seeds and chemicals) to enhance the adoption of rice double cropping. Production credit and marketing services ensure the proper facilities for the transition from the traditional system of farming to one of a modern "Green Revolution" agriculture.

In Kemubu the establishment of FA system is costly. Until 1976, 30 percent of project farmers are members of FAs. But farmers cannot interact effectively with management in the establishment of priorities

¹This was found to be the case in Ethiopia and Ghana for AID-related projects. See Michael A. Fuchs-Carsch, "Planning Donor-Supported Small Farmer Projects in Less Developed Countries: Lessons from Ethiopia and Ghana" (a Ph.D. dissertation presented to the University of Tennessee, Knoxville, August 1976).

if the FA institution is absent. Small farmers must be sufficiently organized to develop their skills and to absorb development changes.

The FA model in Malaysia is an introduced institution and foreign to Malaysian farmers and administrators. As we have seen in this study, mistakes have been made in the implementation of the FA programs in the FAs' misplaced attempts to depend on local capital. From the improved production levels and farm returns, FAs have hoped to syphon whatever surplus capital is generated as an outgrowth of the project for investment in future FA activities.

There are implementation problems in the Kemubu experience. Some of these are "management" issues, problems that arise from the lack of managerial capacity in (1) the central administrative structure of Ministries and government agencies and (2) the project organization itself.

The first management issue is related to the multiple-objectives of development programs. Often the objective of maximizing the development impact of project include several aspects of development priorities--rice production, employment opportunities, marketing services, production credit and farmers' involvement in project decision-making. These development objectives are often vested with different agencies of government. Therefore it requires an integrated action and investment in several scattered agencies. The bureaucracy in the administrative system of government agencies and weakness in managerial capacity prevent the proper coordination (inter-agency links) from taking place.

This leads to the second issue--weakness of management at the project level. The Project Authority is burdened with additional goals

and development objectives. In Kemubu the project is intended to increase food production through the adoption of rice multiple cropping. We have seen that rice productivity in Kemubu increased during the six-year period, 1972-1977. But farmers' incomes in the project have not increased enough to sustain and accelerate development efforts. This has of late become more pronounced because poverty among small farmers is still prevalent.

Within ongoing projects like Kemubu, results of concerted efforts to reach particular target groups to irradiate poverty become the new criterion and measure of project success.

Two observations that emerge from the Kemubu experience are: (1) Management is faced with the difficult task of balancing existing considerations (which arise from political and social needs to redress regional disparities in infrastructure due to resource endowment as well as historical and other factors) against the desire to accelerate food production to attain self-sufficiency. (2) Broad-based projects which are geared to food production problems need also to be concerned with the development of local institutions that involve small farmers, the distribution of income and other benefits of development, employment and institutional problems of small farmers--poverty and uneconomic farm holding (small farm size).

Some problems that stem from the Kemubu experience can be summarized thus:

1. Lack of adequate appreciation of the technical problems involved in multiple cropping, i.e., the nature of the agro-climatic factors and the

quality of the engineering structures developed to tap water resource for the development.

2. Inconsistency between the food policy declarations and the actual programs carried in the project.

3. Weakness in management coordination among government agencies involved in the implementation of the project programs.

4. Lack of data on social and economic factors--the key determinants for management decision making to arrive at priorities and strategies for program implementation.

The last management weakness as observed in Kemubu is essential--getting relevant and timely information to the right people. Methods of control, documentation and evaluation that can be built into the ongoing project management structure are also necessary. This implies the need for a monitoring system to facilitate data collection on a permanent basis.

The main characteristic of monitoring is that it should be regularly carried out so that it provides timely information and problems in project implementation and operation. But there should not be too much preoccupation with data collection, at the expense of project flexibility and project program implementation. Ongoing evaluation should be a routine aspect of project management primarily geared to seek solutions to the problems of implementation.

Evaluation and monitoring are necessary also to adapt the project to changing objectives with perceptions of social needs and constraints

faced by small farmers within a developmental and change-oriented project such as the Kemubu project studied here.²

²See S. K. DeDatta, K. A. Gomez, R. W. Herdt and R. Banker, *A Handbook on the Methodology for an Integrated Experiment-Survey on Rice Yield Constraints* (IRRI, Los Banos, Philippines, 1978).

The methodology suggested in the IRRI study includes the following objectives:

1. To measure the on-farm gap between the yield with production techniques or input levels for maximum yields and the yield of representative farmers in their physical environments.
2. To determine the extent to which use of each tested technical factor can be profitably increased.
3. To determine what social and institutional factors prevent farmers from using technology that gives higher, more profitable yields.
4. To determine whether it is possible to change the physical and socio-economic factors constraining yields, and the difficulty, if any, of making such a change.

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APPENDIX

APPENDIX

FARM DEVELOPMENT CENTRES (FDCs)

The Farmers Association Act of 1973¹ marked the establishment

¹See Ahmad Sarji bin Abdul Namid, "Farmers' Organization Authority Malaysia--it's structure, functions and policies (August 1974, unpublished).

The promulgation of the Farmers' Organization Authority Act, 1973, therefore, represents a restructuring of rural institutions and a major reorganization of the administrative machinery pertaining to rural development by integrating the functions of the Department of Agriculture in respect of farmers' associations and the Department of Cooperatives Development in respect of agro-based cooperatives, into the Farmers' Organization Authority. The Farmers' Organization Authority was established on February 14, 1973 through the passage of the Farmers' Organization Authority Act, 1973. Its functions are enumerated under Section 4 of the Act, as follows:

- a. To carry on all activities particularly of commercial and industrial enterprises, the carrying on whereof appears to it to be requisite, advantages or convenient for or in connection with the discharge of its said function, including the primary production, manufacturing, assembling, processing, packing, grading and marketing of agricultural products, research and training.
- b. To initiate preliminary studies of possible agricultural development and redevelopment and make preliminary plans outlining agricultural development or redevelopment and preliminary surveys to determine if the undertaking and carrying out of such agricultural development or redevelopment projects are as a Farmers' Organization enterprise feasible.
- c. To request departments, government or non-governmental agencies engaged in carrying out or intending to carry out agro-based development for the benefit of farmers to submit report regarding their activities or proposed activities containing such particulars and information as may be specified by the Authority and to cooperate with the Authority in its efforts to develop Farmers' Organizations.

of a new concept in rural institutions among Malaysian farmers. As an outgrowth, nine FAs were established in Kemubu. Each area FA was designed to include an area of 10,000 acres of paddy farms. Farmers in the project area were expected to be members of the area FA in the area where they were farming.

The designation of each area FA according to irrigation supply area was a way to get farmers together and to facilitate the rapid expansion of multiple cropping in the project. The memberships in the KADA FAs reached 30 percent of all project farmers by 1976. They attracted largely the more progressive farmers; many small farmers were still not in the program. A reason for the low percentage of farmers becoming members was the KADA policy of wanting to limit membership of each FA to a size that could be served effectively by the local FA management. Another reason was the high rate of turnover in staff; by 1976 only 60 percent of the FA positions were filled.

Initially the FAs in the project area were manned by the extension staff on assignment from the State Department of Agriculture. The remaining number of staff within the State Department of Agriculture was inadequate to provide enough help to farmers. The problem was compounded further by the heavy work load of the staff assigned to the newly formed FAs.

The Farmers Organization Authority (FOA) was responsible for the establishment of Farm Development Centres in Malaysia.²

²For the concept of Farm Development Centres see Ahmad Sarji bin Abdul Hamid, "Farmers' Organization Authority Malaysia--Its structure,

Each FA area would cover between 5,000 to 10,000 acres of farms and involved between 1,000 to 2,500 farm families. The FDC concept meant the establishment of a centrally located office within each FA area. The FDC would provide farmers with extension help, credit, inputs and marketing services. It was planned that such a centre would operate in a coordinated effort with related agencies that have programs for the benefit of farmers and the local community. The coordination of activities can be seen in Figure A.1. The cost of the Kemubu project can be seen in Table A.1.

functions and policies" (August 1974, unpublished).

- a. A well defined area of operation to be called "Farmers Development Area" where concentrated economic and social development can be implemented
- b. Concentrated and coordinated efforts of all agencies-- Government and private, and the people, to accelerate economic and social development in such priority areas.
- c. An efficient and multi-functional Farmers Development Centre in each area which can provide all the essential services for accelerated economic and social development.

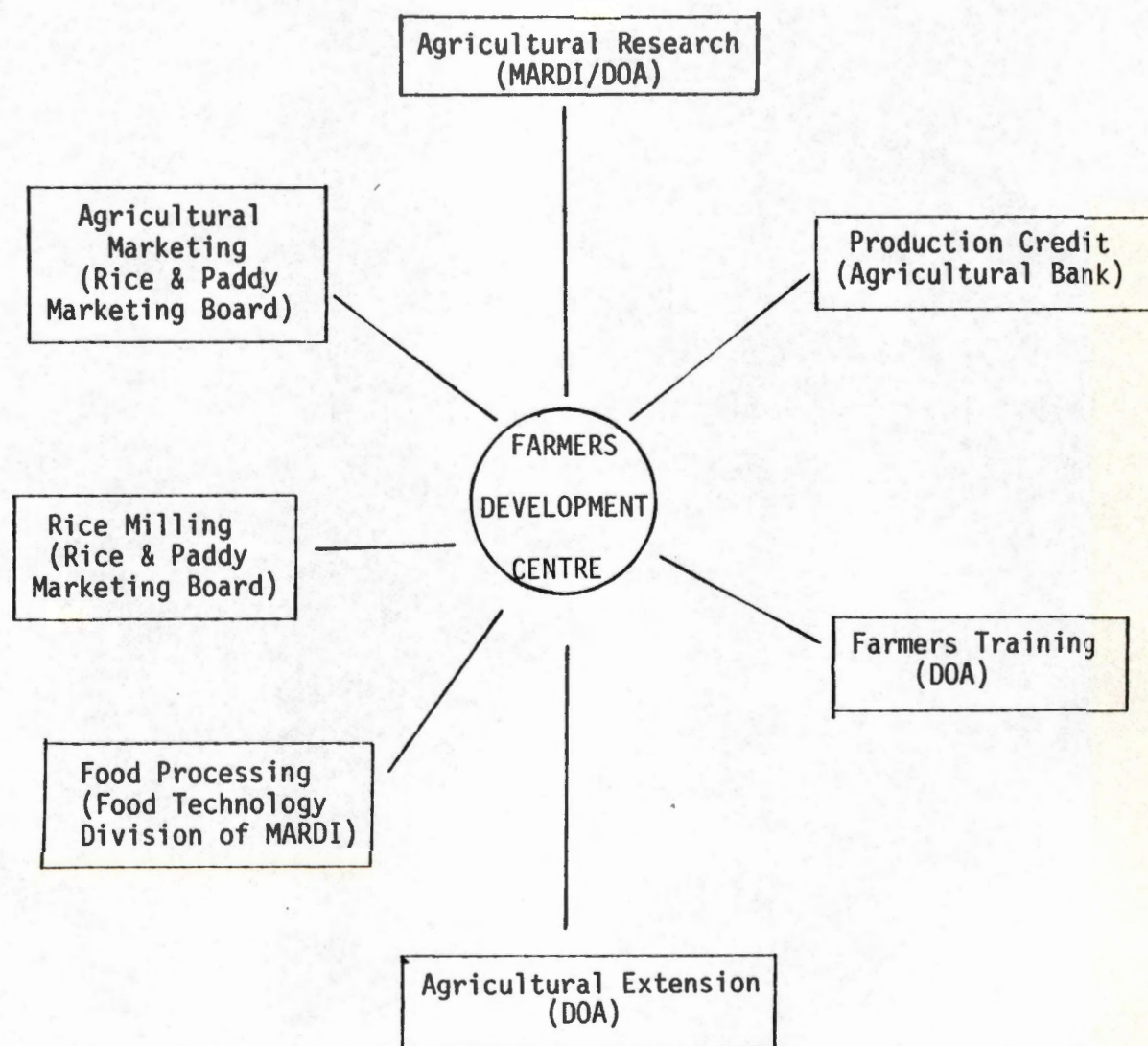


Figure A.1. The Farm Development Centre and its relationship with research, extension, credit institution and marketing services.

Table A.1. The Kemubu Project Cost

Item	Cost (M\$ millions)
A. Land	
1. Land acquisition	11.600
B. Civil Works	
1. Pumping Station	1.800
2. Flood Protection Dikes	.496
3. Irrigation	19.000
4. Structures	10.383
5. Quaternary Canals	3.367
6. Drainage	9.414
7. Diversion Dams	.390
8. Buildings	.900
9. Farm Development Centres	1.300
C. Equipments	
1. Pumps (5 Diesel pumps)	2.700
2. Booster pumps (2 pumps)	.225
3. Operation and Maintenance Equipment	.480
D. Consultancy Services	
1. Supervision of construction	2.889
Total project cost	66.244

Source: World Bank. *Kemubu Irrigation Project Completion Report*, Report No. 796-MA (June 1975, Annex 2, Table 1).

VITA

Nik Hassani Mohamed was born on April 6, 1939, in Kota Bharu, Kelantan, Malaysia. He completed his high school at Maktab Sultan Ismial in Kota Bharu in 1957. He entered Universiti Pertanian Malaysia (Agricultural University Malaysia in Kuala Lumpur) in 1958 and graduated with a Diploma in Agricultural Science in 1961. He was appointed a county agent with the Department of Agriculture Kelantan in June 1961. In 1965, he received the Ford Foundation Scholarship to study at the University of Tennessee. He graduated with a B.S. in Agricultural Economics in December 1967. In June 1978 he obtained the degree of Master of Science in Agricultural Economics. From 1968 to 1969, he was appointed as an Agricultural Officer with the Department of Agriculture Kelantan. In 1970 he became the Agricultural Division head of Kemubu. He took leave from his job in September 1975 to start on a Ph.D. program at the University of Tennessee.