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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

PROJECT PAPER

THAILAND

KHON KAEN UNIVERSITY RESEARCH DEVELOPMENT PROJECT

493-0332

MAY 1983

USAID/THAILAND

UNCLASSIFIED

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PROJECT DATA SHEET

1. TRANSACTION CODE

A = Add
 C = Change
 D = Delete

Amendment Number _____

DOCUMENT CODE
3

2. COUNTRY/ENTITY

Thailand

3. PROJECT NUMBER

493-0332

4. BUREAU/OFFICE

Asia

04

5. PROJECT TITLE (maximum 40 characters)

KKU Research Development Project

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
06 30 89

7. ESTIMATED DATE OF OBLIGATION
(Under "B:" below, enter 1, 2, 3, or 4)

A. Initial FY 83 B. Quarter 3 C. Final FY 89

8. COSTS (\$000 OR EQUIVALENT \$1 =)

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
Aid Appropriated Total						
(Grant)	(284)	(1,716)	(2,000)	(284)	(1,716)	(2,000)
(Loan)	()	()	()	()	()	()
Other U.S. 1.						
Other U.S. 2.						
Host Country					1,447	1,447
Other Donor(s)						
TOTALS				284	3,163	3,447

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) 103	241B	030				2,000		2,000	
(2)									
(3)									
(4)									
TOTALS						2,000		2,000	

10. SECONDARY TECHNICAL CODES (maximum 5 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code BR RGEN 978
 B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To strengthen the institutional capacity of Khon Kaen University to conduct research appropriate to Northeast rural communities.

14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final MM YY
 01 85 03 89

15. SOURCE/ORIGIN OF GOODS AND SERVICES

000 941 Local Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment)

17. APPROVED BY

Signature: Robert Halligan
 Title: Robert Halligan, Director, USAID/Thailand

Date Signed MM DD YY

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

ACRONYMS AND ABBREVIATIONS

ADRC	Agricultural Development Research Center, Khon Kaen
AID	Agency for International Development
AVRDC	Asian Vegetable Research Development Center
CDSS	Country Development Strategy Statement
CGIAR	Consultative Group for International Agricultural Research
CIDA	Canadian International Development Agency
CIMMYT	International Center for Maize and Wheat Improvement
CP	Conditions Precedent
DLD	Department of Land Development
DOA	Department of Agriculture
DTEC	Department of Technical and Economic Cooperation
EEC	European Economic Community
FSR	Farming Systems Research
ICRISAT	International Crops Research Institute for Semi-Arid Tropics
IDRC	International Development Research Center
IRRI	International Rice Research Institute
KKU	Khon Kaen University
LDC	Less Developed Country
MOAC	Ministry of Agriculture and Cooperatives
MUA	Ministry of University Affairs
NERAD	Northeast Rainfed Agricultural Development Project
NESDB	National Economic and Social Development Board
NRC	National Research Council
PACD	Project Assistance Completion Date
PP	Project Paper
RDI	Reserch and Development Institute
RTG	Royal Thai Government
TA	Technical Assistance
UNDP	United Nations Development Program

THAILAND
KHON KAEN UNIVERSITY RESEARCH DEVELOPMENT PROJECT
PROJECT PAPER

I. SUMMARY AND RECOMMENDATIONS

A. Costs

Total Project costs are as follows:

<u>AID:</u>	- Grant	\$2,000,000
<u>RTG:</u>	- Budgetary and In-kind Support	<u>\$1,447,000</u>
	- Grand Total	\$3,447,000

B. Purpose

The Royal Thai Government has requested USAID assistance in expanding the research capability of Khon Kaen University (KKU) in the Northeast. The purpose of the project is to strengthen the institutional capacity of Khon Kaen University to conduct research appropriate to Northeast rural communities.

C. Description

The project will provide six (6) years of foreign exchange and local currency support to conduct rural based research in Northeast Thailand and to strengthen the capability of the Research and Development Institute (RDI) and KKU's academic faculties to do such research. The project has been developed in close collaboration with the Government of Japan with whom it was agreed that parallel agriculture research projects in the Northeast would be undertaken. USAID assistance is being directed primarily toward strengthening KKU's research capacity; and Japanese assistance is being directed primarily at establishing an Agricultural Development Research

Center in Khon Kaen with the Ministry of Agriculture's regional Departments of Agriculture and Land Development being the primary recipients. Together, however, they will provide important resources for development in the Northeast.

D. Analyses - Summary Findings

The analyses within the project paper conclude that the proposed project is technically, socially, economically, and financially feasible. The Implementation Plan is sufficiently developed to begin project implementation within 3 months after project authorization. Given that the activities to be undertaken in the project are not directly revenue producing, standard cost-benefit analysis is not appropriate. A cost-effectiveness analysis was conducted indicating the alternatives considered and efforts made to minimize costs.

E. Waivers

No off-shore procurement of equipment is anticipated under this project. Most short term Technical Assistance (TA) and other related foreign exchange costs will originate in the United States. In cases where the U.S. is not the best source of technical advisory services, or participant training, host country and Code 941 procurement is proposed. Faculty of Agriculture and RDI related project equipment, including vehicles, will be provided to Khon Kaen University by the Japanese Government under a collaborative project. Minor equipment needed to support research will be procured off-the-shelf in accordance with AID provisions of small value and shelf item procurement. No waivers are anticipated.

F. Statutory Requirements

All Statutory Requirements have been met. See Annex I "Project Checklist".

G. Recommendations

That the project paper be approved and that \$2 million of AID grant assistance be authorized so that implementation can begin in FY 83.

H. Project Committee

USAID

Dr. Basharat Ali, Office of Projects and Engineering Support
Mr. John Foti, Office of Agricultural and Rural Development
Ms. Carol Peasley, Deputy Director
Mr. Thomas Johnson, Office of Projects and Engineering Support
Mr. John Coughlin, Office of Finance
Dr. Sam Johnson, USAID Consultant

RTG

Dr. Terd Charoenwatana, Acting Rector, Khon Kaen University
Dr. Akin Rabibhadana, Director, Research and Development Institute, KKU
Dr. Kavi Chutikul, Dean, Faculty of Agriculture, KKU
Mr. Manoth Sooksapcharoen, USAID Sub-Division, DTEC

II. PROJECT DESCRIPTION

A. Background

Although national and international investment in rural based research has increased markedly in the past decade, only a small fraction of the rural population in most LDC's has benefited. Accelerating the process of generating relevant research will require continued rapid expansion of investment in agricultural and related research. The lack of or weak indigenous research capability in LDC's has highlighted the need to enhance research capabilities at the national and regional level, particularly since it is becoming clear that countries without a significant in-country capacity to do research also lack the capacity to do the necessary adaptive and "trouble shooting" work required to benefit from research done elsewhere. This project will strengthen the research capacity of a regional university in Northeast Thailand.

Agriculture is the most important economic sector in Thailand. Even though agriculture's share of GDP has fallen over the last two decades, it still contributes 25% of total GDP and provides employment for two-thirds of the Thai labor force. During the past twenty years agricultural production has expanded at an annual rate of 5% compared to a 2.5-2.8% increase for the rest of the world. Thailand is the only country in Asia and among six countries in the world with a net surplus of agricultural products for export continually for the last twenty years.

Most of the increase in agricultural production has been achieved by expansion of land under cultivation rather than by increased productivity per unit area of land. The option of bringing new lands into production, which has primarily been at the expense of Thailand's natural forests, is now approaching its limits. Thailand is at the stage where it has to intensify production on existing agricultural land in order to achieve growth rates anywhere close to the Fifth Five-Year Plan target of 4.7% for agriculture.

This is particularly true in the largest but poorest region of the country, the Northeast, where 90% of the agricultural land does not have access to irrigation but is totally dependent upon monsoon rains. Constraints faced by Northeast rainfed farmers include sandy soils with low waterholding capacity, erratic rainfall, lack of capital and poor access to such services as extension and appropriate technologies. These constraints contribute to under-utilization of land, low cropping intensity and poor crop yields, all of which hamper farmer adoption of modern technologies. Use of inappropriate farming practices not only results in wide fluctuations in yields but also leads to severe soil erosion problems.

To reverse declining trends in agricultural yields and to preserve the land resource base of the Northeast, it is necessary to develop new, more appropriate rainfed agricultural technologies. Also in order to move away from a basic single crop, glutinous rice, subsistence type environment* and reverse declining trends in yields, more detailed knowledge of variations in agroecological conditions and improved farming systems are required (see Annex H for a detailed description of the Northeast).

Greater cooperation between the research programs of the Ministry of Agriculture and Cooperatives (MOAC) and Khon Kaen University (KKU) can contribute significantly to expanding this knowledge base. To this end the Governments of the United States and Japan, in close consultation with the RTG, have reached agreement to undertake collaborative agricultural development research projects in Northeast Thailand. It has been further agreed that USAID assistance will be directed primarily toward strengthening KKU's capacity to develop and implement rural-oriented research while the Japanese assistance will be directed primarily at strengthening the research capacity of the MOAC. These collaborative projects will be used as a mechanism to foster coordination of research activities in the Northeast as well as a means of further strengthening MOAC and KKU capacity to develop technologies appropriate for the unique needs of rainfed farmers in Northeast Thailand.

* In certain areas farmers have started growing upland crops such as cassava, kenaf and sugarcane, as well.

B. Project Rationale

1. Relationship to CDSS and RTG Priorities

This project is an outgrowth of the Mission's strategy of the late 1970's and early 1980's--i.e., to focus resources on the special needs of the rural poor in the Northeast, the largest and poorest region of the country. It is also an important part of the Mission's newly evolving program strategy--a strategy which will be based on a more broad-based analysis of institutional constraints and development needs. Support to regional universities such as KKU will be an important part of the Mission's strategy for the 1980's.

This project is also closely related to RTG priorities. The Fifth Five-Year Plan accords top priority to assisting poor families of the backward regions, which the government, as well as AID defines as the rainfed and highland agricultural zones. The Government's future plans are to clearly differentiate in its programs and policies between the subsistence (backward areas) and the more advanced areas. The National Economic and Social Development Board (NESDB) has identified 286 poor districts and sub-districts in the Northeast, North, and South which are being targetted for intensified efforts to meet basic human needs and provisions for receiving appropriate agricultural technologies. Moreover, the project's strategy is in harmony with the policies the Ministry of University Affairs (MUA) to develop and improve Thailand's institutions of higher learning. MUA's policies emphasize academic research, extension of academic services to local communities and the promotion of knowledge, understanding and appreciation of Thai culture.

2. Rationale for Technology Development/Research

Research activities under the MOAC are not organized in such a manner as to be directly applicable to the wide range of needs of Northeast villagers. This is particularly true if farming is viewed as a total system

with crops, livestock, fisheries, tree crops and off-farm opportunities seen as components of the system. Most Department of Agriculture (DOA) research is straight commodity oriented with separate divisions (or institutes) for rice, upland crop (field crops), horticulture, sericulture and rubber. Each of these divisions has its own experiment stations and, in effect, runs independent research programs that originate and are controlled out of Bangkok. Extension and agricultural economics are also separate departments with independent budgets, leadership and work plans. This dispersion of research and development activities, accentuated by the shortage of well qualified staff permanently stationed in the region, often results in research results that are not very pertinent to actual farmer needs and fail to address many of the real constraints facing farmers in rainfed areas of the Northeast.

In contrast, the regional university at Khon Kaen has a rapidly expanding number of well trained researchers in a wide range of disciplines. There are more Ph.D. and M.S. level qualified staff at KKU alone than are stationed outside of Bangkok with the MOAC throughout the entire country. The organization of the university is such that multi-disciplinary research programs can easily be organized where the bureaucratic structure of MOAC makes this type research activity extremely difficult both to organize and to implement.

The Northeast region with its undulating terrain, erratic rainfall patterns, low levels of soil fertility and organic matter, and isolation from major urban markets require specialized rainfed farming systems and technologies. Appropriate technologies can only be developed by researchers that live in the area and over time develop an appreciation for the real problems facing farmers and rural communities. Strengthened capacity of KKU to identify and implement a strong rural research development program and to coordinate this research with other on-going MOAC research is critical to meeting these specialized needs of the rural population in the Northeast. Recognition of this fact by the RTG and donor agencies forms a major rationale for this project. It is also recognized that expanded agro-rural

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research and development activities will feed directly back into the teaching program at KKU and result in graduates that are better trained and oriented toward working in the rural areas of the Northeast.

C. Project Description

1. Summary of Goal, Purpose and Outputs

a. Goal - The long term goal of this project is to improve the quantity, quality and relevance of research activities and services related to problems facing Northeast rural communities. The achievement of this goal can be measured in terms of a broad reaching, on-going university research program which is directed toward rural development needs of Northeast villagers and rural communities. These research findings should result in (a) a better understanding of the development problems of the Northeast, (b) improve KKU's ability to provide basic and applied research assistance and support to RTG development agencies as well as private institutions and (c) improve the quality of graduates from KKU by ensuring they are exposed to the problems of Northeast villagers as well as modern, rural based research methodology and programs.

The achievement of this goal requires satisfying five key assumptions which are as follows:

- Royal Thai Government (RTG) and KKU will provide sufficient human and financial resources to implement research results on a continuing basis.
- RTG willing to utilize research results to improve services.
- Researchers from the university are able to ascertain the needs of Northeast Thailand villagers.

- Farmers and rural communities, either directly or indirectly through RTG agencies, will have access to and utilize research findings.
- Private sector groups have access to and are willing to utilize research results in providing goods and services.

b. Purpose - The project's purpose is to strengthen the institutional capability of Khon Kaen University to conduct research appropriate to Northeast rural communities. Conditions indicating that the project purpose has been achieved include:

- RDI will have capacity to administratively support agricultural/rural community based research in the Northeast.
- Research conducted in support of agricultural/rural communities completed and disseminated to appropriate end-users.
- Information/publication section of RDI functioning as a repository for research reports and as a disseminator of research findings.
- Evidence of KKU coordination with other development projects in Northeast.
- Change in research approach from single function, single commodity focus to multi-disciplinary integrated problem solving research.

Because the project purpose builds on existing institutional entities (RDI and the various faculties) and the commitment of KKU to strengthen RDI, the assumptions underlying achievement of the purpose are

less difficult to satisfy than those underlying goal achievement.

Achievement of purpose requires:

- KKU committed to strengthening RDI, i.e. KKU faculties allowing RDI to play a coordinating role.
- Strengthening of RDI will lead to better quality research conducted by KKU.
- Japanese will provide necessary equipment/vehicles to support project activities, and
- AID and DTEC resources will be provided on timely basis.

2. Project Activities

The project will focus on strengthening the University's overall research capability, which includes (a) the Research and Development Institute's capacity to administer, facilitate and coordinate research and (b) the university faculties' ability to increase relevant rural community research. The Khon Kaen University Research Development Project will require an estimated \$3.4 million. USAID will provide a \$2 million grant while the RTG will provide \$1.4 million in budgetary and in-kind support.

The USAID grant will be used to finance research operations, short term technical assistance, training workshops, and short term training for KKU research personnel. \$1.5 million will be used for research and \$500,000 for core support to strengthen the University's long term research capabilities. The RTG's contribution will support in-kind costs such as staff salaries and allowances, office space and equipment and budgetary support for the construction of needed facilities, in-country per diem and local travel costs for short term consultants and international travel for short term training programs for Thai staff.

The activities to be funded under this project fall into three categories. First is a well established set of research activities, which involves research in crops, livestock and social sciences, using farming systems research (FSR) methodology and techniques developed under a previous FSR program financed by Ford Foundation. FSR activities have been developed by the best researchers from KKU and are viewed as a model for multi-disciplinary research at KKU. The second set of research activities will include both commissioned and (open invitation) solicited rural development research projects developed by individuals, departments, faculties, or outside research entities. The third set of activities (noted for budget purposes as core activities) involves the strengthening of RDI's administrative capacity and short-term training either at regional centers (such as IRRI or ICRISAT) or at KKU itself with guidance and/or assistance by RDI. Following is a more definitive description of some of the planned research/training activities by category:

a. Integrated Farming Systems Research (\$800,000)

\$800,000 of the \$1.5 million for research will be reserved for integrated farming systems research. KKU faculties proposing research in this area will work closely with the FSR Advisory Committee as well as staff from other donor projects to develop research priorities. A mechanism for determining actual village needs and feeding these back into the research program will also be developed. Taking this into account, the following set of possible research activities is accepted as tentative, subject to future review and modification as deemed necessary.

Shortly after project authorization and early in the first year of the project, a list of FSR activities will be identified for year 1 funding. These initial research activities will form the basis for subsequent FSR. The following represents an illustrative list of anticipated Integrated Farming System Research:

(1) Social Science Research

- Village and household demographic structure and dynamics.
- Health and nutritional status including food habits and dietary pattern, particularly as they relate to cropping and livestock production patterns.
- Labor resources and utilization over time and space by on-farm and off-farm activity.
- Social factors affecting control and utilization of resources in integrated farming systems.
- Farmer values and decision-making related to various crop and livestock production practices.
- Farmer knowledge of agricultural technology and understanding of farming systems.
- Sources of income and relative profitability of alternate on-farm and off-farm activities.
- Quantity of rice produced, consumed, and stored as a safety measure against drought. Yields of other crops and marketing strategies.

(2) Animal Science Research

Livestock research projects will be formulated in relation to the problems and needs of the small farmers who largely subsist on crop production with livestock, including poultry, as an integral part of

their integrated farming systems. The following general areas of research should play important roles in improvement of animal production under small farm conditions.

- Research on animal nutrition, feeding and management. Village livestock feed supplies encompassing quantity and quality, as well as year-round fluctuation, need to be examined. It is necessary to identify suitable ways and means to improve the utilization of crop residues and by-products in order to increase village livestock production.
- Research on prevention and control of livestock diseases and parasites at village level. Practical and effective vaccination schemes against serious infectious poultry diseases are to be devised and tried in the village. Traditional animal health care techniques practiced by the villagers should be examined for their technical value.
- Village livestock production system. During the first year, monitoring of village livestock production dynamics in relation to crops, man and other village environments is to be carried out in order to be able to identify problems and needs of the villagers.
- Livestock breed improvement. Production performance of various livestock under village conditions is to be examined. Effects of crossbreeding on village pigs, or cattle will be studied.

- Improvement of animal-drawn farm implements. The efficiency of work by animals in crop fields could be greatly increased by the improvement of traditional farm implements and harness systems.
- Research in fisheries. Wherever small farm ponds exist in the village, selected species of fishes could be raised. Studies on the integration of fish into the crop/livestock system will be carried out.

(3) Plant and Soil Science Research

Research in agronomy and soil science will form an important set of information for field and farm level work. A significant amount of the work during the first year will be in monitoring on-going systems. Much of this research will be conducted by a team of researchers from different fields collecting data from the same experiment or surveys. This type of research will help individual members of the research team to understand the overall picture of any experiment or existing systems of farmers and therefore should accelerate the identification of new cropping techniques and systems.

- Agro-climatology. The significant impact of early and late rainfall during the monsoon season, particularly in relation to planting of field crops, will be closely studied. It is not known at present how many millimeters of rainfall are sufficient for different types of land preparation and planting on various soil types and topographic positions. The relative significance of various environmental factors such as climate, land form, soil physical properties, etc., will be studied to see how they relate to actual crop production.

- Soils. Studies on soil moisture potential distribution as affected by topographic position, soil types, water tables, as well as techniques of land preparation, will be the major focus of soil

research during the first two years. Soil researchers will also make intensive studies on the chemical and physical properties of the soils found in the locations where field crops are actually grown either before or after the monsoon season.

- Plant Protection. Monitoring infestation of insect pests and plant diseases will be a major part of the plant protection research program. Studies will be conducted to develop low-cost but effective ways of controlling key pests, particularly beanfly for mungbean and subterranean ant for peanuts.

b. Comissioned and Open Invitation Rural Development Research (\$700,000)

In contrast to the FSR research plan which is relatively well organized with a large number of discrete research activities tentatively identified, commissioned and open invitation rural development research projects have yet to be formulated. These are expected to evolve over the life of the project. A few possible areas of research include:

- evaluation of the operations and implementation of national or region-wide RTG tambon or village level development schemes.
- research on the role and needs of rural women.
- research on forest preservation villages and traditional village woodlot systems.
- alternative systems for providing palatable village water supplies including small ponds, village wells and rooftop rainwater collection systems.
- studies to evaluate alternative uses for agricultural by-products with a particular emphasis on developing indigenous sources of fuel for cooking.

- marketing surveys both for agricultural and non-agricultural village produced commodities.

In determining what research will be financed and carried out under the commissioned and open invitation type, the Rural Development Research Committee will apply the following mutually agreed upon research selection criteria. The Selection Criteria are divided into two distinct areas; those which are limiting in nature and those which are conditional. The limiting criteria are noted below 1-5 followed by the conditional criteria 6-12:

- (1) Research must contribute to the social and economic well-being of rural based population in Northeast Thailand. The following are illustrative of the types of research proposals that will be considered:
 - (a) Agriculture systems
 - (b) Employment--on and off farm
 - (c) Income generation--on and off farm
 - (d) Rural health
 - Nutrition
 - Water supply
 - Population
 - Health education
 - (e) Non-formal education
 - (f) Rural based organizations (formal and non-formal)
 - (g) Development planning and evaluation
 - (h) Rural technology
 - (i) Marketing
 - (j) Post harvest technology
 - (k) Credit-formal and non-formal
 - (l) Resource conservation

- (2) Commissioned 1/ as well as open invitation 2/ research will be funded. Initially a minimum of 25% of the funds reserved for this category will be reserved for each of the two types of proposals. The remaining 50% will remain unprogrammed so as to support either category depending on quality of results and ability to initiate and utilize resources.
- (3) No individual proposal should exceed 500,000 Baht or be less than 50,000 Baht.
- (4) All proposals will be prepared in accordance with the following suggested design format:
 - (a) Problem statement
 - (b) Research objectives
 - (c) Methodology
 - (d) Plan of work
 - (e) Inputs
 - (f) Budgetary requirements by quarter
 - (g) Output (expected beneficiaries, reports, it answers the "what is the final product".)
 - (h) Information dissemination
- (5) Proposals commissioned from researchers outside of KKU must also have participation of KKU staff.

1/ Commissioned research is research which is initiated by the Research and Development Institute (RDI) and cuts across more than one faculty. Research will be conducted by the participating faculties with RDI facilitating and coordinating the research. These proposals would be submitted to the Rural Development Research Committee for screening.

2/ Invitation research is research which is solicited through normal university channels. These proposals would follow the normal administrative university screening process noted on page 33, B. Research Operations.

- (6) Research proposals should facilitate the development of research capability of currently less active faculty .
- (7) Proposals should be tied to broader research programs or as a follow-on to already conducted research so that the end results will be a larger body of knowledge directed at specific development constraints.
- (8) The involvement of KKU students in research implementation is desired.
- (9) Research proposals that include financing from other sources are encouraged.
- (10) Research proposals which are supportive and complementary to research financed under the Japanese Agricultural Development Research Project are encouraged.
- (11) Proposals which emphasize farmer participation and are oriented toward field-level implementation are encouraged.
- (12) Proposals which show clear linkages between research to be conducted and the upgrading of teaching requirements are to be given preference.

c. Strengthening of KKU Research Capabilities (\$500,000)

(1) Research and Development Institute - RDI at Khon Kaen University was established in 1980 to serve as a center for development in the Northeast. Its primary purposes are to coordinate, facilitate, administer and extend research activities, train field workers/field supervisors and serve as a link between rural organizations; identify

sources of research support; and function as a repository for research information on Thailand and elsewhere. In order for RDI to administer, coordinate and facilitate research, it has to recruit and train additional staff. In addition it must develop a financial and administrative system that provides for efficient management of projects funded from a variety of sources. After staff have been recruited, judicious use of local consultants is critical both for establishment of procedures and for training. Moreover, it is envisioned that RDI, in its role as coordinator, will facilitate the bringing together of weaker research faculties with those which are stronger (as well as outside research entities) in an effort to strengthen the research capacities of both faculties. Most of this type of research will be financed under the commissioned type research noted in this Paper. In addition, the \$500,000 in core funds available under this project will be administered by RDI in support of overall research conducted in this project. It is envisioned that RDI will, for example, initiate technical assistance (contractual arrangement) required by the various research activities. Finding other sources of research funding (both Thai and foreign donor sources) will be another important role to be performed by the Institute. The director of RDI will have to spend a significant amount of his time to ensure that these administrative and implementation procedures are properly developed and operationalized. USAID support for the RDI will include TA, staff salaries, training and some limited amounts of equipment.

(2) Other Support to KKU - In an effort to maximize the utility of research being conducted under this project and to improve its quality the project will provide support to related activities. Several kinds of support are anticipated. First, it is envisioned that two workshops will be organized for social scientists participating in FSR: One on research design and field data collection methodology and one on data analysis and report writing. Senior foreign and Thai scientists will be contracted to conduct these training sessions. Short-term applied training in crop production methodology will be financed, most at IRRI and ICRISAT,

although local training courses in crops and livestock production methodologies may be held at Khon Kaen, Kasetsart or in conjunction with the Ministry of Agriculture and Cooperatives at the Northeast Regional Agricultural Center at Tha Phra. RDI will play a major role in coordinating these activities.

For social science researchers, senior RDI staff plan to organize training programs both in research methodology and rural or community development work. Much of this training will be held in the field around Khon Kaen and will emphasize multi-disciplinary research that has a direct impact on rural development activities. Additional short-term training at regional institutions such as IRRI and University of the Philippines at Los Banos (UPLB) will be organized as deemed necessary.

Workshops to disseminate results and to interact with other concerned individuals and agencies are viewed as an important part of this project. FSR research groups, both from agriculture and from social sciences, plan to hold a minimum of three such workshops during the life of the project. RDI also plans to hold workshops with experienced field workers and field supervisors to identify and discuss means to solve various problems in rural development. In addition, RDI plans to organize village workshops to bring together villagers and researchers to help establish better understanding between villagers and rural development researchers.

D. Project Beneficiaries

The project will improve the research, teaching and public service programs of Khon Kaen University in the fields of agriculture, rural development, engineering, economics, etc. thereby enabling the University to produce more relevant research and better trained rural leaders. By improving the quality and quantity of research being conducted and coordinated by KKU, the project will have both direct and indirect beneficiaries.

1. Direct Beneficiaries

The project will directly benefit approximately 500 persons including university researchers, research support members, farmer cooperators and students. Of the number, 150 will be principal researchers and 350 indirect researchers; approximately 15 staff members will benefit from short term training at either IRRI or ICRISAT. This project will impact directly on 60 per cent of the faculty and 50 per cent of the student body who plan careers in the agricultural science, rural development and related fields.

2. Indirect Beneficiaries

The rural population will benefit from improved research and resulting public services programs, both those implemented directly by the university and those resulting from activities of better qualified university graduates who will form the backbone of program planning and implementation of RTG agricultural/rural development programs. The ultimate beneficiaries of the project are the more than 2 million poor households of the Northeast which depend on agriculture and related enterprises for their livelihood. These households are characterized by low income levels, low productivity, dependence upon a declining resource base, poor markets, inadequate access to health, education, and other social services, very limited opportunities for off-farm employment and, in general, limited prospects for improving their well-being.

3. Women Beneficiaries

Thai women are playing an increasing important role in Thai development. This importance is reflected in the fact that of the 4,300 undergraduates in 1981, 1776 were female. Also, females out-numbered males in the faculties of Education, Nursing, Dentistry, Humanities and

Social Sciences. Slightly less than one-half of the staff at KKU is female. It is the intention of project planners to ensure that women play a proportionate role in project activities.

4. Benefits and Spread Effect

By contributing to the knowledge base and economic growth of the Northeast, Khon Kaen University will contribute to and help create a climate conducive to retaining many of the brighter and more able young people and potential local leaders who might otherwise be lost to the region by migrating to Bangkok for their education and subsequently remaining to enter an already crowded labor market there.

Through this project, Khon Kaen University will conduct and help coordinate the research conducted by other research agencies which will provide improved technologies for the small farmer. Students, research workers, agricultural and other rural cadre and extension workers will be trained so that the provincial agriculture schools, government research stations and extension offices are more effectively staffed and utilized. Project supported research will focus on the problems facing poor farmers of the Northeast so that progress achieved may result in greater equity.

E. Relationship to Other Donors

Japanese - The Japanese aid program is widely diversified covering virtually all areas of economic development. The current Japanese aid program runs approximately \$350 million per year. In agriculture the Japanese have and continue to provide funds for projects concerned with fisheries, animal health, maize development, rice seed storage, rainfed rice production, sericulture, training for irrigated agriculture, and ecological studies on insect vectors of rice diseases.

More specifically and as noted in the Background section of the PP, the Governments of Japan and United States have agreed to undertake collaborative agricultural development research projects in the Northeast. In this effort, Japanese assistance will concentrate on establishing an Agricultural Development Research Center (ADRC) on Department of Land Development property in Khon Kaen. The center will conduct research and analysis on drought conditions, their effect on agricultural production, means of anticipating and ameliorating such conditions and developing crops which are capable of satisfactory yields under drought conditions. The center will concentrate on data collection/analysis and research on incidence of drought, rainfall distribution patterns, evapo-transpiration rates, and other regional agro-climatic topics. The Japanese have not yet carried out a detailed project analysis and design, however, the MOAC has already endorsed the proposal as noted above. Approximately \$5 million will be used to finance building construction, equipment and technical assistance.

Related to these collaborative activities the Japanese Government has agreed to purchase equipment and vehicles in support of USAID's project with KRU while USAID has agreed to support the GOJ's efforts with short term technical assistance to the ADRC.

Canadian Assistance - Currently the Canadian International Development Agency (CIDA) is reviewing a feasibility study that it commissioned on the RDI. The Feasibility Study was prepared by the current Director of RDI and calls for an expanded role for RDI and 80 million Baht in financial support. Indications from CIDA are that they are very much interested in supporting the RDI, and that the amount of financial assistance provided will be determined after an internal review of the feasibility study is completed and negotiations with the RTG are completed. It was further stated by CIDA that USAID should continue with its proposed program, and that whatever CIDA decides to do will be complementary to USAID proposed activities.

Other Donors - There has been a long history of cooperation between Thailand's agricultural entities and most of the major international donor agencies and governments. Among the most significant cooperators in Thailand's development have been: the World Bank, the Asian Development Bank, UNDP, FAO and the Governments of Australia, New Zealand, Canada, Federal Republic of Germany, EEC, and others. The Rockefeller and Ford Foundations have actively pursued major institutional development programs in Thailand for the last 15 years. In addition to the above there have been a number of research and development institutions and agencies including the international agricultural research centers of the CGIAR who have working agreements with Thai research institutions. Specific cooperation is now underway with IRRI, CIMMYT, AVRDC and ICRISAT.

Currently Khon Kaen University is receiving several million dollars in development support, most importantly New Zealand's support for the construction of a medical school and faculty. The Faculty of Agriculture at KCU is the most active faculty in terms of research. In fiscal year 1980-81 there were 35 research projects with contributions from foreign donors totaling \$500,000, roughly one third of the Faculty's overall budget. Some of the donors included Australia, New Zealand, Canada, USAID, Ford Foundation, France, and Japan.

III. SUMMARY OF FEASIBILITY ANALYSES

A. Institutional/Administrative Analysis

Khon Kaen University was established in 1966 to serve the needs of seventeen provinces of Northeast Thailand. The University currently has ten faculties and one in the planning stage. Enrollment expanded from 107 original students to 4,426 students in 1982. The university has followed a conscious policy of giving admission preferences to students that have completed their high school studies in the Northeast. This has resulted in a student body of over sixty percent from the Northeast.

KKU's budget has increased dramatically since its establishment, from 20 million Baht in 1966 to 290 million Baht in 1980. Approximately sixty percent of the current budget is used for capital investment. In addition to the operating expenses, salaries and capital development allocations, the RTG provides 1 million Baht for research. This is a relatively small amount when compared to research funds provided by foreign donors and agencies. This amount, as noted above, currently runs \$500,000 per year. Related to this, it should be noted that Thai universities were conceived of as teaching institutions with no research responsibilities. It was not until recently that research was made an official university function. The lack of RTG support for research forced universities to seek research funding from outside sources. This need to obtain outside research funds has resulted in fragmented research programs and has often resulted in research that is not all that relevant to rural community needs. In an effort to address this problem, the Research and Development Institute was established in 1980. Although RDI itself is relatively a new organization, the Director of RDI is an energetic individual with an excellent research reputation. Also, KKU has considerable experience in administering research funds from a number of foreign agencies. In order to facilitate project implementation, the use of University's existing procedures to the extent feasible is encouraged. Notwithstanding, the proposed project provides for limited RDI staff support, training and technical assistance to strengthen

RDI's capacity to manage project activities. Briefly, it is determined that the project is administratively feasible (See PP Annex C for detailed discussion on the subject).

B. Technical Analysis

The project will support a relatively new institute, RDI, and the university faculties. By making a substantial amount of research funds available to KRU, its need to cater to outside sources of funding will be reduced. This will lead to more relevant rural based research in that research priorities will not be set by necessity to comply with outside donor requirements, but with Thai interest and concerns. This should at the same time strengthen RDI's coordination role. Moreover, the availability of funds will increase the number of research studies to be conducted and thereby providing research students an opportunity to be exposed to "real-world" problems of rural communities. Though both RDI and the university faculties are staffed with some key people there is still a limited number of staff that have been participating actively and, of those, many have other university administrative, research and/or teaching responsibilities. Given the amount of administrative work and variety of research to be coordinated by RDI, there will be a continuous need to bring local and expatriate consultants into the program.

C. Economic Analysis

Because the project is institutional development in nature it has been determined that the standard benefit--cost analysis does not fully apply. The project is justified on the grounds that agricultural as well as other types of research undertaken worldwide indicates high returns. There is every reason to believe that similar results are attainable in Thailand. A cost-effectiveness analysis of alternatives considered and efforts to minimize costs was conducted. The project was designed in such a manner as to minimize costly procedures, equipment, and outside consultants, while at the same time maximizing the use of university faculties, experience and staff (See Annex E for details).

D. Financial Analysis

The total project cost is estimated at \$3,447,000. The AID grant contribution over the 6 year life of project is \$2,000,000, while DTEC's counterpart funding is estimated at \$152,000 and KKU's in-kind and budgetary support is calculated at \$1,295,000.

As noted above the host country budget is based on both in-kind and budgetary contributions. Most of the KKU staff (principal research investigators) involved as well as facilities to be used already exist and are in KKU's regular annual budgets. Additive recurrent costs to the RTG will not be great and will be limited to salary raises and facility maintenance. The effects of this activity will be of an opportunity cost nature, rather than a heavy burden of additive financing. The RTG's ability to meet its direct budget contribution and staff augmentation should be continually examined in light of the austerity measures imposed by the Bureau of the Budget and Civil Service Commission. This, however, has not been a noticeable problem with other USAID-financed projects and is not expected to be a problem in this project.

E. Environmental Analysis

The questions of herbicide, pesticide and fertilizer use in research trials was examined by AID's Regional Environment Officer. He concluded that the project, in part, was low cost adaptive research directed at the resource conditions found in Northeast Thailand and therefore the use of expensive agricultural chemicals would be minimal. Moreover, project related farming systems research will be conducted directly under the supervision of KKU researchers, all of whom are familiar with the importance of proper handling of such chemicals.

Based on the above, the Project Paper Design team concluded that in view of the research orientation of this project, a Categorical Exclusion from further environment assessment is appropriate under AID's Environmental Procedures 22 CFR 216. 2(c)(2)(ii).

F. Relevant AID Policy Statements and Evaluations

1. Policy Statements

USAID has reviewed and considered the following AID policy papers in its development of the PP.

- a. Institutional Development,
- b. Food and Agriculture Development,
- c. Women in Development,
- d. Basic Education and Technical Training
- e. Participant Training,
- f. Recurrent Costs,
- g. Natural Resources and Environment.

Upon close examination of the afore-mentioned policy papers, it became apparent that the detailed guidance provided in the last 4 policy papers did not particularly apply to the formulation of this project. This project is in conformity with the directions provided in Institutional Development policy paper and partially within the terms of Food and Agriculture and Women in Development policy papers.

The proposed project is essentially an institutional development project. It is aimed at strengthening the institutional capacity of a local university (Khon Kaen University) to conduct research appropriate to rural communities in Northeast Thailand. The improved capacity of KKU will help resolve problems unique to the rural Northeast region by improving the quantity, quality, and relevance of its research activities. The project, therefore, conforms with AID's stated position that viable institutions are a major means to solve critical development problems. AID places high priority on the development of institutions which have the capacity to tap into and contribute to world knowledge. KKU's work in farming systems and in rainfed agriculture fits this criterion well.

In the absence of private research institutions, the institutional development of an existing public institution of higher learning like KKU

(with prior successful experiencing in administering research grants from private foundations and other donor agencies) is fully justified. Outside organizations, public or private, are, however, eligible to compete for limited research funds within the framework of the project. The participation of private sector institutions is also encouraged by the provision of grant funds for outside consultancies to different research teams on a variety of technical matters.

The project does not propose the creation of a new organizational structure in isolation from existing institutional framework. It is focused on streamlining the University's existing operating mechanism in response to its ever increasing involvement in research activities. This is to be accomplished partly by concentrating presently scattered generalized functions (such as selection of proposals, contracting, financial control and monitoring) into a single unit, i.e., RDI, supported by two University research committees.

The proposed project provides for built-in incentives to adapt and expand opportunities for institutional learning. The competitive selection process challenges researchers from various faculties to come up with research proposals which meet or exceed the agreed upon selection criteria. The proposed project provides unlimited opportunities for practical experience in research operations and for upgrading appropriate research, technical and management skills of University students, faculty and administration over a sufficiently long period (6 years), in an environment which will facilitate institutional growth and effectiveness. The strengthening of institutional capacity of KKU to conduct research will enable it to support other development efforts, by creating new knowledge, in resolving critical developmental problems of Northeast Thailand.

This project also complies to the guidance contained in Food and Agricultural Development policy paper. To the extent that enhanced KKU institutional capacity generates a continuing stream of innovations designed to increase agricultural productivity and incomes, and to the extent that the research studies in this project are expected to focus on agriculture

and the welfare of farm families, the proposed project is justified because of its potential for benefiting the agriculture sector and its farmers. The Food and Agricultural Development policy paper endorses support to institutions which deal with productivity-limiting problems such as rainfed/dry land farming common to various countries in the region. KKU is expected to contribute to the research work being done at such institutions as ICRISAT and IRRI. The proposed project is providing funds for research in the problem areas specifically identified in the policy paper, e.g. integrated farming systems and rainfed agriculture.

The utilization of local institutions for special studies, research, design work, evaluation, etc. is a recommended means of strengthening institutional capacity to contribute to food and agricultural development. The "hands-on" experience of managing research will give KKU an empirical basis for assessing their institutional deficiencies and correcting them. As a result of this pragmatic approach toward improved capacity, Northeast Thailand will have a local institution with a capacity to collect, analyze and/or use data for relevant policy formulation affecting agricultural productivity in Northeast Thailand.

AID supports the development of institutions which include women and effectively enhances the role of women. Women are fully represented in all faculties/departments of KKU. The University's farming systems approach to agricultural research also provides unique opportunities for the researchers to develop direct contacts with rural women who constitute the majority in Northeast Thailand. Benefits stemming from application of research findings will accrue in large measure to this majority.

2. Evaluations

AID has assisted the developing countries by supporting their efforts in the creation, development and strengthening of national, regional and international institutions to conduct research for more than 30 years. This was done by provision of training, technical assistance and

adequate facilities. Since the 1970's, however, AID's research focus has shifted to the development of technologies more suited to the need of small farmers. The development of these technologies requires knowledge and understanding of the farmer's resource base. The strengthening of research capacity of KKU is an important avenue for ensuring this understanding and the relevancy of research to the problems of rural communities of Northeast.

USAID has taken into account the applicable concerns raised in the relevant evaluations noted below. Farming systems research is included in the project to ensure that KKU researchers gain sufficient experience in conducting studies and verifying research findings under actual conditions. Additionally, steps will be taken to ensure coordination between MOAC and KKU. The dissemination of research findings to potential users is proposed as a covenant in this project paper. Briefly, the proposed project takes into account and conforms to the "lessons learned" as reported in available relevant AID evaluation reports.

- a. AID Program Evaluation Discussion Paper No. 13 "AID Experience in Agricultural Research: A Review of Project Evaluations", May 1982.
- b. AID Project Impact Evaluation No. 27 "Korean Agricultural Research: The Integration of Research and Extension".
- c. AID Project Evaluation Report No. 30 "Guatemala: Development of the Institute of Agricultural Science and Technology (ICTA) and its Impact on Agricultural Research and Farm Production", February 1982.
- d. AID Project Impact Evaluation Report No. 34 "Agricultural Research in Northeast Thailand", May 1982.
- e. Murphy, Josette, "Agricultural Research and Development: The Finding of Eight Impact Evaluations", June 1982.

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IV. IMPLEMENTATION PLAN

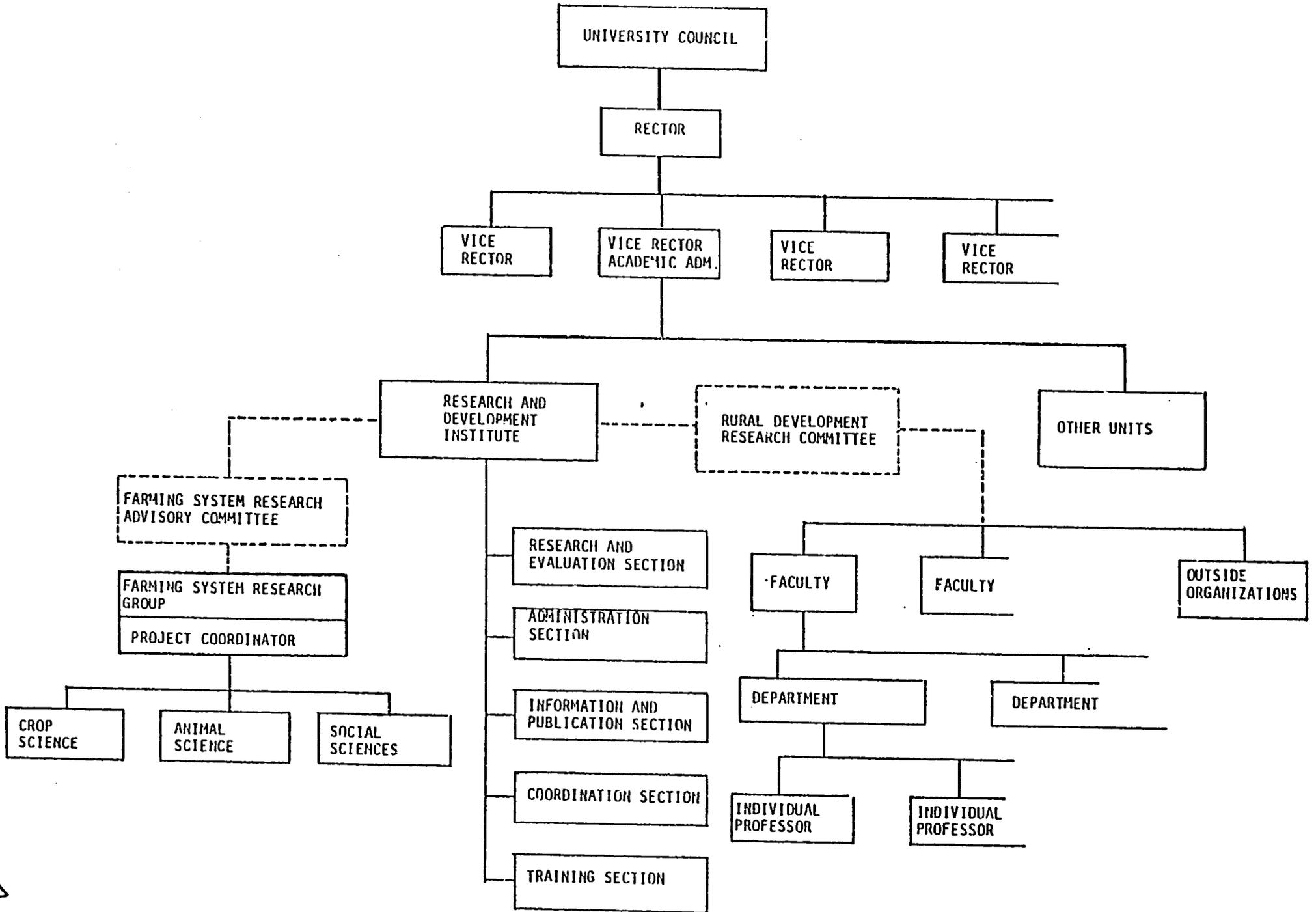
A. Project Organization

All project activities will be coordinated by the RDI which is under the direct supervision of the Office of the Vice Rector Academic Affairs. The organizational chart in Chart IV-1 indicates the organization of project staff to undertake project responsibilities.

The Director of the RDI will serve as the KRU-RTG Project Manager. It is the Institute which will coordinate all project activities within the University and deal with all external organizations such as the DTEC, USAID and others. Presently, the RDI is staffed with 4 researchers, 1 secretary and 2 borrowed typists. It appears that RDI is adequately staffed for purposes of coordinating research activities. The Institute, however, lacks basic administrative staff to support project activities. It is expected that RDI will recruit the additional qualified staff soon after the final draft of the PP is approved. This pre-implementation activity will facilitate in bringing the required RDI support staff on board (an initial CP) immediately after the Grant Agreement is signed.

It is expected that detailed operating procedures, including financial/accounting, research coordination/management, and procurement of services and equipment, will be established prior to or immediately after the signing of the Grant Agreement. Sufficient consultancy support to the RDI is provided, during the first 15 months of the project, to ensure the development of these operating procedures. These consultants are expected to be brought on board at critical project stages such as when the annual research plan is formulated or when the quarterly/semi-annual financial and progress reports are being prepared/coordinated/compiled for submission to DTEC and USAID. To ensure that the operating procedures are modified as needed until these become fully operational and institutionalized and in order to maintain sufficient degree of consistency, it is anticipated that the RDI will use, to the extent possible, the same consultants throughout the life of project.

CHART IV-1
 PROJECT ORGANIZATIONAL CHART
 KHON KIAEN UNIVERSITY



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B. Research Operations

The RDI will invite research proposals for project funding. The selection criteria, operating procedures, and the deadline for submission of proposals will be advertised at least once a year allowing sufficient time for screening and approval by the appropriate committees. This will be followed by the preparation of an annual research plan and a financial plan by RDI. The submission of the first fiscal year research plan (October 1, 1983 - September 30, 1984) and first 15 months financial plan (July 1, 1983 - September 30, 1984) for project core activities (other than research) are proposed as conditions precedent in this project paper. For the subsequent fiscal years (beginning October 1, 1984), however, the submission of only a comprehensive financial plan, encompassing all project core and research activities, is a condition precedent to disbursement.

The Farming Systems Research Group will submit its annual research plan to the FSR Advisory Committee for review and approval. The approved FSR plan is then forwarded to RDI by the Committee for compilation of the annual research/financial plan.

The research projects (commissioned and open invitation research) proposed by other faculties and outside organizations will be submitted directly to RDI. The RDI staff will pre-screen these for their compliance with the agreed upon selection criteria. These research proposals will then be forwarded to the Rural Development Research Committee for approval. This Committee will send the approved rural development research plan back to RDI for compilation of the annual research/financial plan. These procedures are expected to be followed by the University during the life of the project. The University may modify these procedures with concurrence from both USAID and DTEC.

The annual research plan is expected to include the number and fields of research activities proposed and approved by KKU detailing title, duration, funding (by major categories), requirements for cash advances by each quarter, needed U.S. and/or local consultancies, etc. This research

plan may be revised by the RDI, with the concurrence of the Committees, at any time during the course of the year. Notification of such revisions will be furnished to DTEC and USAID.

C. Procurement Plan

1. Equipment

No offshore procurement of equipment is anticipated. The major project equipment, including vehicles, will be funded and provided to Khon Kaen University under the Japanese Agricultural Research Development Project with the Departments of Land Development and Agriculture, Ministry of Agriculture and Cooperatives.

It is impossible to predict research specific project commodities at this time. Minor items needed to support research will depend upon the nature of each research project and will be procured following AID approved "off-the-shelf" procedures. The procurement of this equipment will be done using the University's existing procurement mechanism in accordance with the provisions of Section 2.2.4, Small Value Procurement, Handbook 11, Chapter 18, Local Cost Financing (shelf items procurement), Handbook I, Supplement B, and other applicable KCU and RTG regulations. KCU procedures will be reviewed and approved by USAID prior to the commencement of any procurement.

2. Technical and Professional Services

Long term technical assistance is not anticipated in this project. About twenty five (25) person-months of expatriate (mostly from the U.S. and, in some cases, from the International Centers) technical assistance of short term duration (approximately 1 to 3 months) is anticipated. An approximate total of seventy six (76) person-months of local consultancies, also of short term duration, is also being planned under the project. Twelve (12) person-months of TA are reserved for the

Agricultural Development and Research Center (ADRC) noted on page 22, Section E. Utilization of minority and/or Section 8 (a) small/disadvantaged firms will be encouraged.

Under standard RTG/AID procedures for grant funded projects, contracting arrangements for local consultants are made by RDI/KKU. However, the Department of Technical and Economic Cooperation (DTEC) will be responsible for contracting with expatriate consultants.

The RDI will be responsible for negotiating all local consultant contracts using DTEC/USAID approved procedures. Each research proposal will include a request form for needed local and/or expatriate consultant services detailing terms of reference (scope of work, qualification, duration, etc.) and proposed nominees. RDI will arrange for short term technical assistance in support of the ADRC program upon the receipt of a formal request from the authorized MOAC representative. The RDI will make contact, negotiate and enter into contracts with the consultants using standardized contract formats (to be developed in consultation with the AID Area Contracting Officer). While the consultant will be professionally responsible to the research team requesting his services, it is the RDI which will be responsible for processing payments to the consultants (processing for direct payments, and seeking cash advances, and/or reimbursements from USAID and DTEC).

D. Training

A limited number of short-term study tours are anticipated. The RDI will formulate/coordinate training requests from various faculties with the assistance of a short term consultant. The identification of the participants and the training programs will be the responsibility of KKU/RDI. The DTEC Training Section will be responsible for all the logistics including placement, arranging allowances, advances, travel from Khon Kaen to points of training and return, etc. The training resources are expected to be distributed among three major interest groups as indicated in Table IV-1.

E. Workshops

A total number of ten workshops are planned over the life of the project. These workshops will be jointly planned and conducted by the RDI and the concerned research group/faculty. The expected distribution of workshops is indicated in Table IV-1. It is expected that all workshops will be held in the Northeast.

F. Publications

The selection of research work for publication/dissemination purposes will be the joint responsibility of the research team and the RDI. The actual publication/dissemination of reports will be the responsibility of the RDI. USAID favors and encourages the publication of scholarly research as well as the maximum availability, distribution, and use of knowledge developed in this project. USAID waives all rights related to publications of research findings financed under this project, as research being conducted are not being prepared for USAID but for the common good of Northeast Thailand.

Table IV-1

Distribution of Core Project Resources/Inputs by Users
(Administered by RDI)

Core Project Resources (Inputs)	Farming Systems Research	Rural Development	RDI	ADRC
1. <u>Technical Assistance</u>				
A. U.S. and Others (25 mm)	10	3	-	12
B. Local Consultants (76 mm)	22	24	30	-
2. Short-Term Training-Regional (20 mm)	10	5	5	-
3. Workshops-On Campus (10)	5	2	3	-
4. Publications (21 units)	10	7	4	-
5. RDI Staff Support (162 mm)	-	-	162	-
6. Evaluation (2)	-	-	-	-
7. Contingency*	-	-	-	-

* Applies to RDI

G. Evaluation Plan

Up to two project-funded evaluations are planned for during the life of project period. Scheduling of evaluations will be based on management need and determined by the project evaluation working group. The project evaluation working group should be established by the Director of RDI as soon as possible, even as part of pre-implementation activities.

The project evaluation working group's* task will be to establish indicators of success of the project as related to the purpose and goal of the project. The working group should be responsible for promoting an understanding of what is expected of the project in terms of results and success through the project management staff. An illustrative example of the timing and purposes of evaluations which the working group could incorporate into its planning follows:

The first evaluation would be conducted in early FY 1985 by a team of USAID/DTEC/KKU representatives and one Thai outside consultant. This evaluation will be conducted for the purposes of assessing the adequacy of operating procedures developed for the review of research proposals, selection and contracting procedures, the administration of the Grant funds and the relevancy of research being proposed/conducted. The findings will be used for making appropriate adjustments in the project implementation.

The final evaluation would be conducted shortly before the Project Assistance Completion Date (PACD) by a team composed of U.S. and Thai consultants. This evaluation will measure the extent of institutional development of KKU in administering/conducting research and the relevancy of research in addressing/resolving constraints to the development of the Northeast.

* Working Group should be composed of university staff involved in project research under the direction of the RDI Director.

Related to the evaluation, the working group will be responsible for establishing a system of gathering data both before (baseline) and after project interventions are made which are related to the selected indicators. The group will also decide on who is responsible for collecting the data as well as when, where and how data should be collected.

Finally, the evaluation working group should develop the scope of work for evaluations. This will include reporting formats, selection of evaluation team, distribution of results and follow-up meetings/workshops to incorporate evaluation findings into future program planning. The working group can, if necessary, bring in consultants to assist for any phase of the project evaluation process.

H. Implementation Schedule

The steps involved in implementing research activities, the major component of the project are expected to follow a reasonably predictable course. The success of the project largely depends upon the RDI's ability to: recruit qualified project support staff, install financial, administrative, contracting and procurement procedures; contract for needed technical services particularly during the first year of the operation; and the provision of general KKU support to the RDI during the early stages of its operation. An illustrative implementation schedule is proposed in Chart IV-2. The financial plan for the project is based on this implementation schedule.

CHART IV-2

ACTIVITY	RESPONSIBLE AGENT	Year						
		1983	1984	1985	1986	1987	1988	1989
1. Grant Agreement								
a. PP Approval	AID/W	X						
b. Agreement signed	USAID/DTEC/KKU	X						
c. Initial CPs satisfied	KKU/DTEC		X					
d. Additional CPs satisfied	KKU/DTEC		X	X	X	X	X	X
e. PACD								X
2. Research								
a. Request for research proposals advertised	RDI	X	X	X	X	X	X	X
b. Research proposals submitted to RDI	Researchers	X	X	X	X	X	X	X
c. Initial screening completed	RDI	X	X	X	X	X	X	X
d. Research proposals screened and approved	Rural Dev. Res. Com. & FSR Advisory Com.	X	X	X	X	X	X	X
e. Annual research plan prepared	RDI	X	X	X	X	X	X	X
f. Annual financial plan submitted (First quarter cash advance request submitted)	RDI	X	X	X	X	X	X	X
g. First quarter cash advances received	DTEC/USAID	X	X	X	X	X	X	X
*h. Quarterly financial status report and cash advance request submitted to DTEC/USAID	RDI		X					
i. Second quarter cash advances made	DTEC/USAID		X	X	X	X	X	X
j. Semi-annual status (and cash advance request) reports forwarded to DTEC/USAID	RDI		X	X	X	X	X	X
k. Third quarter cash advances made	DTEC/USAID		X	X	X	X	X	X
l. Quarterly financial status report and cash advance request submitted to DTEC/USAID	RDI		X	X	X	X	X	X
m. Fourth quarter cash advances made	DTEC/USAID		X	X	X	X	X	X
n. Annual financial and semi-annual progress reports forwarded to DTEC/USAID	RDI		X	X	X	X	X	X

*First quarterly financial status report (FY 1984) is not required.

MP

I. Reports

1. Financial

As indicated in the implementation schedule, the RDI is to submit quarterly financial reports. These reports are expected to summarize the status of cash advances and cash disbursements by each research project and by other project components. These reports will be compiled by the RDI staff based on information/reports received from the research teams/project entities and in accordance with the reporting formats to be provided by USAID. These reports will be used by USAID and DTEC as a basis for making cash advances for the succeeding quarter.

2. Progress

The RDI is required to submit progress reports on a semi-annual basis. These reports will summarize all on-going research projects and other project activities. These reports are expected to include such information as the number and fields of research activities proposed and approved, current status and expected dates of completion. The progress reports are to be prepared in English and submitted to USAID and DTEC when due, and will be used by these agencies for monitoring project activities.

3. Consultants

Reports from consultants, contracted by RDI for strengthening its own operations, will be required by both DTEC and USAID.

4. Research

The RDI will submit five copies of final completed reports on all research projects to both USAID and DTEC. This will be done promptly after each research project is completed/closed. A short English summary will be included with each report.

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J. Monitoring

The primary responsibility for managing the project activities rests with the Director of the RDI. It is expected that the RDI will develop its own detailed plan for monitoring project activities.

This project is explicitly designed to reduce USAID and DTEC involvement in monitoring project activities. Towards this end, the criteria for selection of research projects and the operating procedures (including mechanism for disbursement of funds) have been detailed in the project paper. As long as the agreed upon procedures are adhered to, KKU has considerable flexibility in administering research funds without DTEC and USAID approvals.

The monitoring responsibility of USAID is limited to overseeing KKU's compliance with agreed upon policies/procedures and the disbursement of funds in accordance with the projected expenditures as evident from the project plans, financial and progress reports. The information required for monitoring project activities is built into the reports required from the KKU. In addition to reports, periodic consultations with the DTEC/KKU officials, site visits, and evaluations will be used as means to monitor project progress. A monitoring checklist detailing monitoring responsibilities within USAID will be developed by the Project Officer. It is estimated that less than 20 percent of the USAID Project Officer's time will be devoted to monitoring this project's activities. As previously stated, the DTEC is responsible for arranging short term regional training/study tours as requested by KKU. Once the annual plans have been approved by DTEC and USAID, no additional DTEC/USAID approval is required by KKU in carrying out project activities. Thus the role of DTEC, like USAID, is limited to monitoring project activities. The DTEC will devise a mechanism to carry out a monitoring function appropriate to its needs.

K. Conditions Precedent and Covenants

1. Conditions Precedent to First Disbursement

Prior to the first disbursement under the Grant, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

- a. A statement of the name of the person holding or acting in the office of the Grantee and of any additional representatives, together with a specimen signature of each person specified in such statement;
- b. Designation of a KKU representative (Director, RDI) as the Project Manager;
- c. Evidence that the Farming Systems Research Advisory and the Rural Development Research Committees have been established;
- d. Evidence that the qualified RDI support staff has been recruited;
- e. A financial plan detailing cash requirements for the first 15 months of the Project for core project activities by each quarter.

2. Conditions Precedent to Additional Disbursement.

Prior to the disbursement under the Grant, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, for any purpose other than to finance project core activities, the Grantee will, except as the Parties may otherwise agree in writing, furnish in form and substance satisfactory to A.I.D.:

- a. Evidence that acceptable operating procedures for the research component, including selection criteria, advertising of research opportunities, processing of research proposals, and for monitoring, have been established by KKU;
- b. For the first year of research activities, a research plan, including the requirements for cash advances by quarter;
- c. For each subsequent year of the Project, an annual financial plan which includes requirements for core activities as well as research activities, by quarter.

3. Conditions Precedent to Disbursement for Activities After October 1, 1985

Prior to the disbursement under the Grant, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, for any purpose after October 1, 1985, the Grantee will, except as the Parties may otherwise agree in writing, furnish in form and substance satisfactory to A.I.D., evidence that the first project evaluation has been completed and that the Grantee and USAID have reviewed implementation procedures and have agreed upon changes as needed.

4. Covenants -

The Grantee agrees, except as A.I.D. may otherwise agree in writing:

- a. to ensure that KKU will carry out the project in accordance with the terms and provisions of this Agreement;
- b. to ensure that KKU will provide and maintain adequate staff at RDI throughout the life of the Project;
- c. to arrange for short-term regional training and study tours and for services of expatriate consultants when requested by KKU, as provided for in the annual financial plan or in any modification of such plan;
- d. to ensure that KKU widely disseminates the findings of project-funded research to potential user groups and beneficiary farmers;
- e. to ensure that the procurement and use of pesticides, if any, for purposes of the project shall comply with A.I.D.'s environmental procedures regarding the procurement and use of pesticides.

V. FINANCIAL PLAN

The Table V-1 provides a summarized financial plan for the project. Out of a total of \$3,447,000 project cost, and AID grant of \$2,000,000 will be used to finance research operations, short term technical assistance (U.S. and local), RDI staff support costs, short term training (study tours) within the region, workshops, research publications, project evaluations and contingency for the use of Research and Development Institute. The RTG's contribution will support in-kind costs such as: staff salaries and allowances, office space and equipment; budgetary support for the construction of needed facilities; project support staff; in-country per diem and local travel costs for short term consultants; and international travel for short term training. The details of financial analysis and plan may be found in Annex F.

Disbursement of Funds

1. USAID and DTEC will make cash advances directly to KKU. The cash advances for research activities will be based on quarterly cash advance requests received from KKU. The cash advances for other project activities will be made in accordance with the quarterly projected cash requirements as set forth in the annual financial plan.

2. Upon receipt of the advance, KKU/RDI will provide the funds to each research team in accordance with KKU approved research plan. KKU/RDI will use its existing accounting procedures governing research grants for exercising financial control. The financial records will be maintained by KKU/RDI for three years following expiration of the Project Assistance Completion Date (PACD).

3. KKU will provide quarterly financial status reports, covering all project activities during the reporting period, to USAID and DTEC in accordance with agreed upon reporting format(s), detailing the disbursement status of cash advances. KKU will prepare a cash advance request for the

succeeding quarter based on its projected requirement for the next quarter minus any significant unspent cash on hand from the previous quarter.

4. USAID and DTEC will review the documentation and, upon approval, liquidate the expenditures claimed against the project and make cash advances for the ensuing quarter.

5. KKU agrees that after each two year period an audit will be conducted on all project financial records by AID or an independent firm as mutually agreed by USAID, DTEC and KKU.

6. The cash advances made to KKU will not draw interest from any financial institution whatsoever.

Table V-1

Illustrative Summary Cost Estimate and Financial Plan
(U.S.\$000)

Inputs	(Baht 23 = U.S.\$1.00)				Total
	FX	AID LC	DTEC LC	KKU LC	
1. Staff Salaries	-	-	-	949	949
2. Office Space	-	-	-	26	26
3. Equipment Use	-	-	-	39	39
4. Construction	-	-	-	239	239
5. Farming Systems Research	-	800	-	-	800
6. Rural Development Research	-	700	-	-	700
7. U.S. Technical Assistance (Short-Term)	212	-	31	-	243
8. Local Consultants (Short-Term)	-	63	87	-	150
9. RDI Staff Support	-	16	24	42	82
10. Training-Regional (Short-Term)	42	-	10	-	52
11. Workshops	-	50	-	-	50
12. Publications	-	21	-	-	21
13. Evaluations	30	25	-	-	55
14. Contingency (Research Development Institute)	-	41	-	-	41
Total	284	1,716	152	1,295	3,447

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AID 1010-28 (7-71)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

(INSTRUCTION: THIS IS AN OPTIONAL FORM WHICH CAN BE USED AS AN AID TO ORGANIZING DATA FOR THE PAR REPORT. IT NEED NOT BE RETAINED OR SUBMITTED.)

Life of Project
From FY 84 to FY 89
Total U.S. Funding \$2.0 million
Date Prepared: April, 1984

Project Title & Number: Khon Kaen University Research Development Project (493-0332)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes: (A-1)</p> <p>To improve the quantity, quality and relevance of research activities and services related to problems facing Northeast rural communities.</p>	<p>Measures of Goal Achievement: (A-2)</p> <ul style="list-style-type: none"> - On-going University Research Program is directed toward rural development needs of Northeast villagers. - Rural communities using research findings. 	<p>(A-3)</p> <ul style="list-style-type: none"> - Annual Research Plan - Progress Report - Project Evaluations - Observations - Project Evaluations 	<p>Assumptions for achieving goal targets: (A-4)</p> <ul style="list-style-type: none"> - RTG and KKU will provide sufficient human and financial resources to implement research on a continuing basis. - RTG willing to utilize research results to improve services. - Private sector groups have access to and are willing to utilize research results in providing goods and services. - Researchers from the University are able to ascertain the needs of Northeast Thailand villagers. - Farmers and rural communities, either directly or indirectly thru RTG agencies, will have access to and utilize research findings.

HS

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 84 to FY 89
Total U.S. Funding \$2.0 million
Date Prepared: April, 1983

Project Title & Number: Khon Kaen University Research Development Project (493-0332)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Purpose: (B-1)</p> <p>To strengthen the institutional capacity of KKU to conduct research appropriate to Northeast rural communities.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status. (B-2)</p> <ul style="list-style-type: none"> - RDI will have capacity to administratively support agri/rural community based research in the Northeast. - Research conducted in support of agri/rural communities completed and disseminated to appropriate end-users. - Information Center functioning as a repository for research reports and as a disseminator of research findings. - Evidence of coordination with other development projects in Northeast. - Change in research, focus from single function, single commodity focus to multi-disciplinary integrated problem solving research. 	<p>(B-3)</p> <ul style="list-style-type: none"> - Consultant Report - Progress Reports - Research Reports - Other KKU records - Last project evaluation 	<p>Assumptions for achieving purpose: (B-4)</p> <ul style="list-style-type: none"> - KKU committed to strengthening RDI, i.e. KKU faculties allows RDI to play a coordinating role. - Strengthen of RDI will lead to better quality (technical, socio-economically and financial viable) research conducted by KKU. - Japanese will provide necessary equipment/vehicles to support project activities. - AID and DTEC resources will be provided on timely basis.

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PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 84 to FY 89
Total U.S. Funding \$2.0 million
Date Prepared: April, 1983

Project Title & Number: Khon Kaen University Research Development Project (493-0332)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Outputs: (C-1)</p> <ul style="list-style-type: none"> - RDI adequately staff - RDI staff with improved operational skills facilitating supporting, and coordinating research. - University faculty and students conducting increased amounts of relevant problem solving research. - Suitable research findings used by Northeast farmers are improving economic well-being. - University organized to allocate research funds. 	<p>Magnitude of Outputs: (C-2)</p> <ul style="list-style-type: none"> - Five (5) RDI staff in place, trained and operating. - <u>X</u> number of contracts negotiated services and commodities. - <u>X</u> research projects funded at \$1,500,000. - <u>X</u> number of research reports prepared. - 20 person-months short-term training completed. - Appropriate university entity reviewing and approving research proposals. 	<p>(C-3)</p> <ul style="list-style-type: none"> - KKU records - Progress and other reports - Project evaluation 	<p>Assumptions for achieving outputs: (C-4)</p> <ul style="list-style-type: none"> - KKU committed to obtain necessary approval and funding to support RDI. - Linkage established to transfer relevant research results to rural villagers. - Faculties interested in carrying out relevant research.

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PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 84 to FY 89
Total U.S. Funding \$2.0 million
Date Prepared: April, 1983

Project Title & Number: Khon Kaen University Research Development Project (493-0332)

NARRATIVE SUMMARY		OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Inputs (D-1)		Implementation Target (Type and Quantity) (D-2)	(D-3)	Assumptions for providing inputs (D-4)
<u>USAID</u>	<u>RTG</u>	<u>Budget/Schedule</u>		
- Research operations	- Regional travel	<u>USAID</u>	- Financial Records	- Funds from GOJ/USAID/RTG will be available in sufficient quantity and provided in a timely matter to cover operating costs, equipment, etc.
- ST training	- Per diem	Year 1 - 0.271 millions	- KKU Records	- RDI has sufficient staff and resources to administer project.
- TA	- In-country travel	Year 2 - 0.384 millions		
- Workshops	- Construction	Year 3 - 0.398 millions		
- Publications	- Staff salaries	Year 4 - 0.394 millions		
- Evaluations	- Office space	Year 5 - 0.346 millions		
	- Existing equip.	Year 6 - 0.207 millions		
	- Proj. staff support	Total - 2.0 millions		
<u>Japanese</u>		<u>RTG</u>		
- vehicles		Year 1 - 0.416 millions		
- research equipment		Year 2 - 0.201 millions		
		Year 3 - 0.194 millions		
		Year 4 - 0.215 millions		
		Year 5 - 0.228 millions		
		Year 6 - 0.178 millions		
		Total - 1.432 millions		
		<u>GOJ</u>		
		(See Annex F)		

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INSTITUTIONAL ANALYSIS

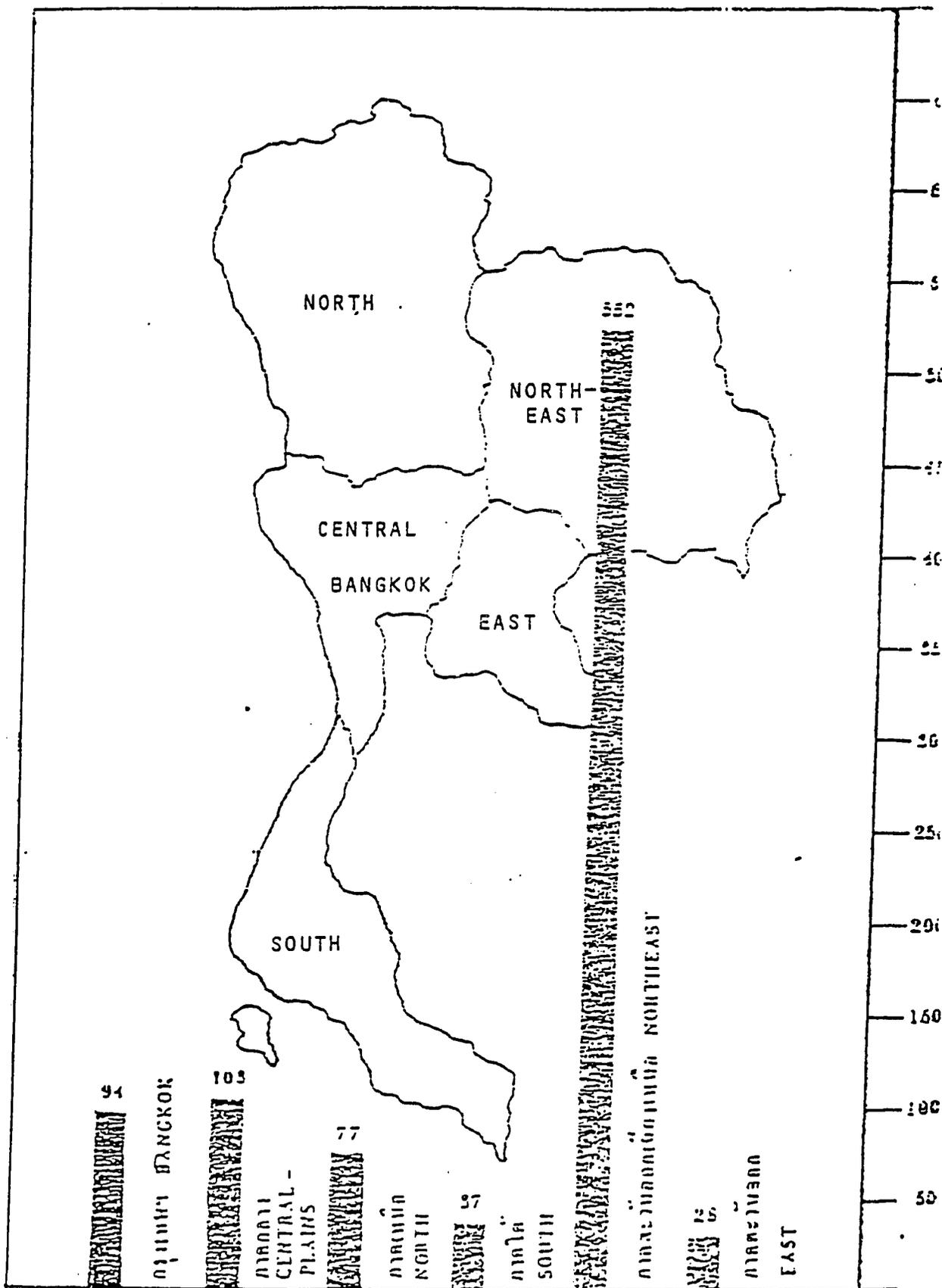
1. Khon Kaen University

Khon Kaen University (KKU) was established by Royal Charter in 1966 to serve the needs of the sixteen (now seventeen) provinces of Northeastern Thailand. Beginning with two degree granting faculties-- Agriculture and Engineering--the following faculties were subsequently added: (1) Education (1969); (2) Nursing (1971); (3) Science Arts (1973); (4) Medicine (1974); (5) Medical Technology (1978); (6) Humanities and Social Sciences (1978); (7) Public Health (1978); (8) Dentistry (1978) and (9) Graduate School (1978). A Faculty of Pharmacy is in the advanced planning stage. Enrollment expanded from 107 original students to 4,294 students in 1980-81. In its initial years of operation, approximately 50% of the total annual enrollment came from the Northeast itself although it was expected that percentages would increase in the future. To help achieve this KKU has, since 1970, set aside special quotas, admission privileges and financial support for students that have completed their high school studies in the Northeast. As indicated in Figure (B-1) this policy is working as over 62% of the entering students during 1979 were from the Northeast.

2. Staff and Studentsa. University Staff

Including the Graduate Faculty, the University now includes 11 faculties with over 850 professional staff members. This includes approximately 140 Ph.D's, 480 M.S.'s and 230 B.S.'s. Out of the 850 staff members about 140 are studying for higher degrees in Thailand and abroad so even without any additional staff members going for higher studies, KKU will soon have approximately 190 Ph.D's, 535 M.S.'s, and 125 B.S.'s. In addition to the Thai permanent professional staff there were 16 expatriate staff at KKU in 1981. They include technical experts (10) and volunteers (6).

FIGURE B-1 ORIGIN OF ENTERING STUDENTS



b. University Students

Under-graduate enrollment in the University is around 4,400 students with the largest number of students enrolled in the Faculties of Engineering (880), Agriculture (700), Education (850) and Nursing (560). In 1981 there were 2,525 male and 1,776 female undergraduate students with females outnumbering males in the Faculties of Nursing, Education, Dentistry, Humanities and Social Sciences and essentially equal percentages in the Faculty of Science. In 1981 the entering class was 55% male and 45% female. An increasing number of the graduates are remaining in the Northeast particularly in the agro-business sector where KKU graduates are starting to hold many key positions.

3. Budget

a. Operating and Capital Development

The budget for KKU from the RTG has increased dramatically since the establishment of the University. The government budget was approximately 20 million Baht in 1966, this increased to 44 million Baht in 1972 and 252 million Baht by 1978. Actual budgetary expenditures in 1980 exceeded 290 million Baht. Breakdown of this budget by office/faculty is presented in Table B-1. The relatively large budget for capital development is primarily due to construction of the new Northeast Regional Health Science Complex. As of 1982 total capital development funds provided by the RTG exceed US\$70 million. Since 1966 US\$18 million in capital development funds have been granted the University by the New Zealand Government.

Table B-1. 1980 Budget Allocation by Office/Faculty

Office/Faculty	Actual Expenditure (Million Baht)
A. General Administration	42.247
B. Teaching and Research	
1. Science	14.235
2. Agriculture	26.980
3. Engineering	11.900
4. Education	11.324
5. Nursing	6.984
6. Medicine	171.117
7. Humanities and Social Sciences	3.858
8. Medical Tech.	1.111
9. Public Health	0.577
10. Dentistry	0.443
Total	290.777
- Operating	114.492
- Capital Investment	176.285
<u>Revolving Funds</u>	
Total	29.673
- Operating	29.119
- Capital Investment	0.554

b. Research Budget

In addition to RTG budget for operating expenses/salaries and capital development the RTG also provides a direct budgetary allocation for research. Presently the direct budgetary allocation is 1,000,000 Baht. Distribution of the funds by Faculty for 1977, 1978, and 1979 is detailed in Table B-2. The National Research Council (NRC) allocates 40,000 Baht* per year to the University for research. Additional research funds have been provided by a number of foreign agencies, including Australia, Canada (IDRC and CIDA), New Zealand, Israel, West Germany and the Ford Foundation. This amount varies by year but currently runs about US\$400,000 per year. Counterpart research funds provided by RTG for these foreign funded projects were approximately 2.5 million Baht during 1979. These extra-ordinary budgetary allocations are 2.5 times the normal RTG research funds. When funds from other sources, including individually contracted research, are included it appears that actual research expenditures at KKU exceed 15 million Baht annually. However, as the University does not presently have a central mechanism to identify outside funded activities it is impossible to determine the actual level of funded research.**

Table B-2. University RTG Research Budget (Thai Baht)

Faculty	Y E A R		
	1977	1978	1979
Agriculture	100,000 (12)	236,150 (13)	331,010
Engineering	100,000 (7)	138,240 (6)	47,000
Science	100,000 (7)	229,500 (13)	88,800
Education	100,000 (11)	36,400 (3)	142,240
Medicine	100,000 (3)	106,000 (6)	185,950
Nursing	50,000 (4)	20,500 (3)	5,000
Others	-	33,210 (2)	-
Total	550,000 (44)	800,000 (46)	800,000

() Number of projects.

* In January 1983 there were research proposals totaling over 460,000 Baht. computing for the NRC allocation.

** 15 million Baht does not include all outside funded research in the 5 medical faculties and is, therefore, almost certainly an underestimate of the actual total.

4. University Organization

a. Administrative Structure

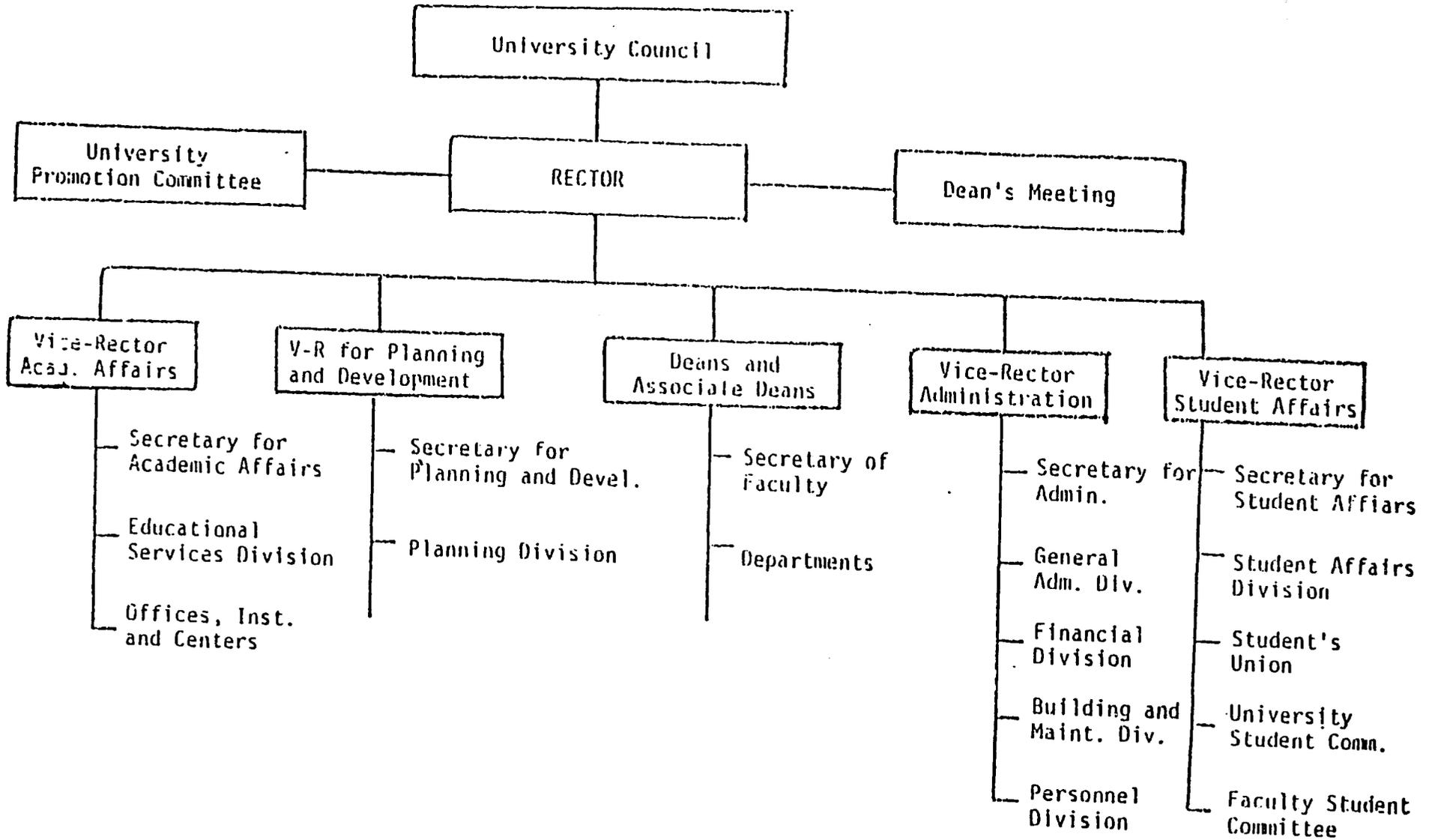
KKU is a Thai Government University operating under the supervision of the Ministry of University Affairs (MUA). There is a University Council consisting of the Rector, Vice-Rector and Deans as ex-officio members. The President of the Council and an additional 9-15 outside members are appointed by His Majesty the King from recommendations submitted by MUA via the Cabinet (the present council is listed in Appendix I). The Council main roles are supervision and policy control. In addition to the Rector, there are presently Vice-Rectors for Planning and Development, Academic Affairs, Student Affairs and Administration. Figure B-2 contained the organizational chart of KKU including details of some of the units under each Vice-Rector.

b. Research Responsibility

With respect to research, the Vice-Rector for Academic Affairs is most important since all offices, institutes and centers fall under his office. This means that the Computer Center, the Research and Development Institute and special office such as the Office of the Central Library are administered through the Vice-Rector for Academic Affairs.

Computer Center: The Computer Center at Khon Kaen University is a computer center in name only. The RTG has not been willing to purchase a computer for KKU so the only machine in the center is a castoff N.E.C. Computer from Chulalongkorn University. This machine has 32K bytes of CPU which is extremely small for any type of major data analysis. Without the necessary software support, complicated by the fact that it is difficult to keep the computer operating (No N.E.C. service facilities are available in the Northeast), the staff have real problems in using this computer.

FIGURE B-2. ORGANIZATION CHART OF KIION KAEN UNIVERSITY



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Central and Satellite Libraries: The University maintains a Central Library plus separate libraries in each faculty. Most of the faculty libraries have their own librarians with the librarian's salary and the bulk of the operating budget provided by the faculty. Presently there are approximately 100,000 volumes, 300 Thai language journals and 557 English language journals in the new Central Library. The total annual budget allocation for the Central Library is more than 4 million Baht including 1.2 million Baht for purchase of books and journals. In contrast, the library in the Faculty of Agriculture has about 6,000 volumes (4,100 in English), 89 English language journals and 65 Thai language journals. This library receives 200,000 Baht from the faculty and 30,000 Baht through the Central Library budget. Total expenditure for books and journals in all the libraries on campus is about 2.4 million Baht annually.

c. Faculties

Of the faculties, the Faculties of Agriculture, Engineering, and Medicine are the strongest both in terms of staff and research competence. In contrast, the Faculty of Humanities and Social Sciences is under-staffed and has very little demonstrated research capability. Appendix II provides details of the Faculty of Agriculture which Appendix III contains a description of the Faculty of Humanities and Social Sciences. By comparing Appendices II and III, it is obvious that the Faculty of Humanities and Social Sciences is very weak and must be strengthened before additional social research can be carried out by the faculty. Brief descriptions of some of the other faculties are available in Appendix IV.



d. Social Science Research

Research that can be broadly labeled social science is carried out across a wide range of faculties and departments at KKU. The Department of Social Sciences in the Faculty of Humanities and Social Science has primary responsibility for the field but there is a significant concentration of social scientists located in the Departments of Agricultural Economics and Extension, the Department of Community Medicine, the Faculty of Education and the Department of Community Nursing. Coordination between the various social science research activities and also between other on-going university technical research is very difficult under the present organizational system. The Research and Development Institute is the logical entity to coordinate research and, in fact, that is the primary rationale for its establishment. However, without a significant strengthening of the Institute it does not have the trained manpower or administrative resources to play this important role. It is also apparent that the overall level of social science research skills in the various faculties has to be upgraded. RDI can play a significant training role if it has the staff capacity.

e. Technical Research

Technical research capacity in the Faculties of Agriculture and Engineering is much stronger and provides the only real institutional base for professional agricultural and rural development research in Northeast Thailand. Yet, even in these faculties the lack of social science input often detracts from the direct relevance of the research to needs of rural communities. An active coordinating and facilitating role by RDI would serve to further improve the quality and applicability of research by these faculties. Administrative functions assumed by RDI would also relieve technical researchers of day-to-day routine activities and free them for additional research.

APPENDIX IKKU/UNIVERSITY COUNCILFrom the University

1. Rector
2. Vice-Rector for Administration
3. Vice-Rector for Academic Affairs
4. Vice-Rector for Student Affairs
5. Vice-Rector for Planning and Development
(Secretary to the Council)
6. Dean of Faculty of Agriculture
7. Dean of Faculty of Engineering
8. Dean of Faculty of Science
9. Dean of Faculty of Education
10. Dean of Faculty of Nursing
11. Dean of Faculty of Medicine
12. Dean of Faculty of Medical Technology
13. Dean of Faculty of Humanities and Social Science
14. Dean of Faculty of Dentistry
15. Dean of Faculty of Pharmacy
16. Dean of Graduate College
17. Dean of Faculty of Health Science

From Outside:

1. Dr. Vichit Srisa-arn (Chairman)
(Deputy Permanent Secretary for University Affairs)
2. Mr. Chamrarn Potechana (Vice-Chairman)
(Khon Kaen Governor)
3. Dr. Snoh Unakul
(Secretary-General, National Economic and
Social Development Board)
4. Dr. Anat Arbhabhira
Former Minister, Ministry of Agriculture & Cooperatives)
5. Mr. Charubutr Ruengsuwan
(Bangkok Senator)
6. Prof. Dr. Chai Mooktapunt
(The Royal Institute, Bangkok)
7. Dr. Thalerng Thamrong Nawasawat
(Permanent Secretary for Agriculture & Cooperatives)
8. Mr. Pokkronng Chayakarn
(Bank of Thailand, Bangkok)
9. Mr. Vilard Uthaichai
(EGAT, Khon Kaen)
10. Police Lt. Col. Vipart Vipulakorn
(Border Police Commander, Khon Kaen)
11. Prof. Sangvien Intaravichai
(Thammasat University, Bangkok)
12. Mr. Apilas Osatananda
(Director-General, Department of Technical and
Economic Cooperation)
13. Dr. Sippanont Ketutat
(Former Secretary-General, National Education Commission)
14. Mr. Soraj Sutcharitkul
(Secretary-General, Civil Service Commission).

APPENDIX II

Faculty of Agriculture

The Faculty of Agriculture, established as one of the first three faculties, aims to produce practical and responsible agriculturalists by emphasising practical and relatively broad training in agriculture. The faculty consists of seven departments: Agricultural Economics, Agricultural Extension, Agriculture Products, Animal Science, Entomology and Plant Pathology, Plant Science, and Soil Science.

The Faculty of Agriculture's main complex consists of a central administration and classroom building, a laboratory building, a 1,500 seat auditorium, a service building for experimental food processing, and a new Plant and Soil Science Building. All of the buildings in the main complex, with the exception of the new Plant and Soil Science Building, were built with grants from the New Zealand Government under Colombo Plan assistance. A 320 hectare farm on the western part of campus is used for research and training. The University Farm consists of the following sections: Feed Mill, Poultry, Swine, Beef Cattle, Dairy Cattle, Fisheries, Veterinary Clinic, Forage Crops, Fruit Crops, Vegetable Crops, Field Crops, Ornamental Plant Survey, Soil and Fertilizer, and Agriculture. The faculty also operates a small experiment station at Chulabhorn Dam (800 meters above sea-level) located approximately 140 kilometers from the main campus.

Most staff are very young with slightly less than one-half female. Fourteen percent have Ph.D.s. and 53 percent M.S. degrees. In the Faculty of Agriculture the qualifications of staff of each department are as follows:

<u>Department</u>	<u>B.S.</u>	<u>M.S.</u>	<u>Ph.D</u>	<u>Total</u>
Agricultural Economics	-	7	1	8
Agricultural Extension	1	5	1	7
Agricultural Products	4	3	-	7
Animal Science	5	7	13	25
Entomology & Plant Path.	2	11	4	17
Plant Science	10	15	7	32
Soil Science	1	8	7	16
Total	23	56	33	112

In 1981, approximately 30 staff members were on study leave locally and abroad. Faculty budget from the RTG in 1981-82 fiscal year was 24.87 million Baht. The total allocated budget for KKU was 410.00 million Baht.

The Departments of Plant Science and Animal Science started graduate programs in 1981 to be followed by the Department of Soil Science in 1982.

The Faculty of Agriculture at KKU is the most active faculty in terms of research. In 1980-81 fiscal year there were 35 major research projects with a total budget of approximately U.S. \$500,000, roughly one third of the Faculty budget. Major research projects are listed in Table II-1 below.

Table II-1. Major Research Projects - Faculty of Agriculture
1980-81 (Thai Baht.)

<u>Project Subject</u>	<u>Funding Source</u>	<u>Budget (Thai Baht)*</u>	<u>Responsible Department</u>
Pasture Improvement	ADAB	2,306,500	Plant Science
Cropping Systems	Ford Foundation	1,604,740	Plant Science
Semi-Acid Crops	IDRC	1,257,740	Plant Science
Cassava Nutrition	IDRC	1,226,965**	Animal Science
Home Processed Legumes	IDRC	508,000	Agri. Products
Shifting Cultivation	JSPS		Soil Science
Nitrogen Economy-Soils	JSPS		Soil Science

*1979 Budget

**1978 Budget

Having strong interest in agricultural and rural development, the faculty has participated in the SEARCA Social Laboratory program since 1978. Ten villages are visited by faculty members to develop their human resources and to monitor change. With assistance from the Asia Foundation, an Intensive Farm Training Program has been set up on the University Farm. In this program, 10 young farm families are moved to KKU Campus and given one year's training in intensive farming on a 0.3 ha. plot of land allocated to each family. Moreover, the Faculty of Agriculture has played a leading role in planning, training, and supervising 15 farm families involved in an experimental small dairy farming project. The Animal Science Department is also involved in improving backyard poultry in villages in several Northeast provinces. The Faculty publishes a bi-monthly journal, called "Kan Kaset" which is a semi-technical journal. This is now the tenth year of publication.

Additional information on the various departments within the Faculty of Agriculture can be found in the Rainfed Agriculture Intensification Project Report called "Integrated Rainfed Farming Systems Research--Khon Kaen University" by Drs. Charan Chantalakhana, Kasetsart University, Sam H. Johnson III of University of Illinois and Terry Rambo, East-West Center, Honolulu, Hawaii.

APPENDIX IIIFaculty of Humanities and Social Sciences

The Faculty of Humanities and Social Sciences is one of the youngest faculties in Khon Kaen University, having only been established in July 1980. Certain departments (foreign languages, library science) had previously been part of the Faculty of Science, while the Departments of Humanities and Social Sciences were newly created.

The Faculty is composed of 4 Departments: Foreign Languages, Library Science, Humanities, and Social Sciences. At present, degrees are offered only in English and Library Science. A major in Community Development will be offered commencing in 1983, with Administration and Management, Thai Language and Literature to be added in 1984, and a major in Population Studies planned for 1985. According to the Faculty's 15 year plan, 10 B.A. degree programs will be offered by 1995, including sociology and anthropology, local government, social work, economics, geography and the environment, etc.

At present the Faculty is housed in a single building. A second structure containing offices, classrooms, and a library, is under construction with completion scheduled for January 1983. Construction on a third building devoted to classrooms will begin in 1984. No space is presently allocated for research purposes. The faculty library currently contains about 8,000 volumes with additional holdings scattered in individual department libraries. When the new building is completed, all these collections will be consolidated, with a librarian provided by the university's Central Library administering the Faculty collection. Periodicals are ordered through the Central Library but there is no union catalog for all of the holdings of the various faculty libraries. Journal

subscriptions are quite limited (no international journals in rural sociology or Asian studies are received, for example) and staff report that it is very difficult to order new subscriptions. The Faculty has no computer facilities of its own, having to rely on the University Computer Center for any required services.

The Department of Social Science currently has 13 staff members, of whom 2 are away on study-leave. Three additional members are under recruitment in 1982-83. Two of the currently employed staff hold Ph.D.'s, while all of the remainder have master's degrees. One additional Ph.D. is being recruited with the other 2 new positions are advertised for entry level master's degree holders.

Staff opportunities for advanced graduate training appear relatively good, especially since the establishment of the Fulbright Program last year. Along with providing a resident American social scientist to serve as consultant to the Department of Social Sciences and the Research and Development Institute, the program has provision for two Ph.D. fellowships at American universities to be granted each year for three years. Unfortunately, cutbacks in Fulbright funds have forced a reduction to giving only one fellowship each year but it is hoped the program will be prolonged to six years in compensation.

Research has only become a serious concern of the Faculty in the last 18 months and is still carried out on a much lower scale than in the longer established and better staffed faculties. At present there are six projects relating to rural development underway or about to commence:

- Attitudes of farmers in Khon Kaen Province towards agricultural development projects of the government agencies. This project is funded by a 90,000 Baht grant from the Frederick Ebert Stiftung.

- The impact of returning migrants on their place of origin. This is a joint project with NIDA with Baht 47,635 provided from KKU's research fund.
- The components of life of people at Ban Ped. Funded by a grant of Baht 25,000 from KKU.
- Management of household resources and the role of women. This research is funded through a direct contract between the investigators and AID/Population Council.
- Rural development emphasising the forest reservation at Paktong Chai District, Nakhon Ratchasima. Funded by a US\$3,000 contract between the investigator and UNDP/FAO.
- Farmer reaction to use of new chicken vaccines, funded by a Baht 19,000 grant from KKU.

There is no central planning of research within the Faculty. Proposals are initiated by individual staff based upon personal interests and knowledge of potential funding sources. No formal process of reviewing proposals prior to submission is followed although an information copy is supposed to be given to the Dean.

It is difficult to evaluate research capability within the faculty at this stage since no project has yet been completed and no final reports have been written. It appears, however, that there is an almost exclusive reliance on survey research using standardized questionnaires. Interviews are mostly done by paid assistants and the social scientists have relatively little direct contact with the rural population they are supposed to be studying.

There appear to be a number of major constraints on carrying out high quality research:

- Lack of experience in designing and implementing field research projects.
- Individual staff members prefer to pursue separate small projects rather than combining their efforts in larger scale joint activities.
- There is no clear relationship between teaching and research responsibilities. Staff who spend time doing research report receiving criticism from those who only teach.
- Many of the staff who have been employed for the longest are professionally underqualified and feel threatened by recruitment of new research-oriented staff with more advanced degrees.
- Social scientists lack close personal contacts with staff in the Faculty of Agriculture. This is a major obstacle to organization of collaborative projects.

Despite these evident constraints on research, remarkable progress has been made by the Faculty in the past three years. More qualified staff have been recruited and several rural development oriented research projects have been launched. A basis now exists for further development of research capability, a basis that was conspicuously absent before.

APPENDIX IVOther FacultiesEngineering

The Faculty of Engineering was established in 1964 with assistance from Canada and New Zealand. Striving to provide engineering talent to help with development of the region, the faculty aims: (1) to produce well trained engineers at the undergraduate and graduate level, (2) to initiate and carry out problem-oriented research relevant to regional development and (3) to serve as a regional center for engineering consultation and service. The Faculty consists of five departments: Agricultural Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. All of these departments offer majors. Present staff number 101 individuals including 16 Ph.D.s and 47 M.S.s with 15 members studying abroad for the Ph.D. The Department of Civil Engineering is one of the best staffed departments in the country with 10 Ph.D.'s and 16 M.S.'s. The Faculty also maintains well equipped laboratories and a mini-computer laboratory. In 1980, a Water Resources Center was established. Presently a M.S. program in structural engineering is available with other graduate degree programs to start soon. Research activities of the staff have focused on specific technical needs of the Northeast particularly water resource development. Under the auspices of the Ford Foundation, staff have actively engaged in programs involving the design, construction and evaluation of small reservoirs and village weirs. In collaboration with New Zealand staff the faculty has established a water resources extension program. Research in agricultural engineering has concentrated on developing farm equipment appropriate for Northeast conditions.

Education

The Faculty of Education, established in 1969, was the first institution in the Northeast to offer a degree in education. Its main objective is to produce university trained teachers both at the degree and diploma levels. Other objectives include giving in-service training programs and other extension services involving primary and secondary education to local teachers and schools, as well as conducting research in the areas of education and psychology in rural areas. The faculty is composed of six departments: Basic Education, Secondary Education, Primary Education, Educational Psychology, Educational Technology and Physical Education. In addition, the faculty also maintains a Demonstration School from kindergarten up to the secondary level. Total faculty student enrollment is now 683, with 63% being female. Faculty members now number 124 with 18 holding doctorates, 44 holding Masters and 38 holding Bachelors degrees. An additional 22 are currently taking advanced degrees.

All research and community service programs are geared toward improving teaching and evaluation techniques and are directed toward rural school teachers. Some of these projects include the Village Development Pilot Project (in cooperation with Khon Kaen provincial authorities), research on Organization and Administrative System in Municipal Schools, research on Classroom Arrangement for Students in Two-Age Groups in Municipal Schools, Training Programme for Headmasters Who Are Group Leaders, Educational Guidance and Counselling Service Programs, and Volunteers for Educational Development in Rural Area Program.

Nursing

The Faculty of Nursing was established in 1971 in collaboration with the Ministry of Public Health and Mahidol University. The aim was to provide at least a partial, if not full, solution to the problem of an acute shortage of nursing personnel for the whole Northeastern region. The faculty prides itself on being the first Faculty of Nursing in the nation. Consisting of seven departments: Medical-Surgical, Public Health, Psychiatry, Midwifery, Maternal and Child, Research and Nursing Administration, and Foundation of Nursing. The faculty offers a four year program leading to a baccalaureate degree in Nursing and a two year supplemental programme leading to a Bachelor of Arts in Nursing degree. The supplemental program was designed in compliance with the request of the Ministry of Public Health to upgrade diploma nurses all over the country. Today the faculty has a total enrollment of 428 nursing students most of whom are female.

Various research and student training programs have placed both faculty members and students in constant contact with villagers.

Science

The Faculty of Science was established in 1964 as a service faculty by providing basic courses in the fields of natural sciences, mathematics and statistics. Realizing the need for well trained scientists and specialists to fill up places in higher education institutes as well as in government and private agencies, the faculty has, since 1973, been offering degree granting programs leading to the Bachelor of Science degree in Biology, Chemistry, Physics, Mathematics and Statistics. Also a degree program in Geology was first offered in 1977.

The faculty is also actively involved in applied research and in-service training programs. The latter in particular sees the faculty regularly giving intensive summer training courses in several fields of basic sciences to secondary school teachers from Northeastern provinces.

Medicine

The Faculty of Medicine was established in 1974 as a major component of the Health Science Center. Development of this center rests on the premise that production of doctors and health related personnel which is normally at great expense can be made much more efficient and at a much lower per-head expenditure if unnecessary repetition of various departments, equipments and facilities is eliminated and if cooperation among these departments is better integrated. Development of health related faculties under a cohesive framework underlying this Health Sciences Center Scheme is thus deemed to be an appropriate approach.

The Faculty of Medicine in particular aims at producing general practitioners; well-trained in community medicine and knowledgeable about local diseases. The faculty offers a four-year program leading to the Bachelor degree in Medical Sciences and a six-year programme leading to the M.D. degree. Total enrollment is currently 274. The first medical students were graduated from KKU in 1979-80.

Department of Community Medicine, Faculty of Medicine

The Department of Community Medicine is responsible for teaching methods of assessing rural health and nutritional status, demography, epidemiology, and medical sociology to all students in the Faculty of Medicine. Students are required to take at least one course in community medicine in each of their first five years. A noteworthy feature is the requirement that all students take part in village field work. Students in the first year course spend 1 day in a village practising demographic data collection, in the second year they live in a village for one week, and in the third year must spend two weeks in a village doing a comprehensive health and nutritional status assessment. This village work is carried out during the hot season vacation so as not to conflict with their normal course requirements in other departments.

The present first year enrollment is 60 with 80 students accepted for next year. It is expected that as many as 100 students will be enrolled in future years. The medical degree is a six year program involving 5 years of instruction and a final year of internship.

No graduate courses are offered but the department is involved in a cooperative MPH training program with the University of Queensland initiated two years ago. Each year, a group of Queensland MPH students, mainly from Southeast Asian countries, spend 3 months in Khon Kaen working on a community health assessment of a rural village. A heavy emphasis is placed on nutritional assessment using 24 hour recall interviewing supplemented by observation and weighing of food intake. Students are required to write final reports on their findings, copies of which are kept on file in the department.

The department has 6 staff members. Five hold Master's of Public Health Degrees, all granted by Thai institutions. One has a M.S. in human nutrition from the London School of Hygiene and Tropical Medicine. The teaching load is relatively light with the norm 3 to 4 hours per week. Demands on staff time during the hot season vacation are much higher because of the need to supervise student field work.

The department has an active research program and staff involvement in research projects appears to be strongly encouraged. Studies currently in progress include:

- Comparison of the nutritional status of rural children from well-educated and less-well educated households. This Thai government-funded study is being carried out in 2 villages in Khon Kaen Province.
- Analysis of the effects on rural child nutrition of supplementary feeding of enriched snack foods. This is a longitudinal survey sponsored by the Dutch Government.

- Epidemiology of goitre in Northeast Thailand. A joint study with the University of Nottingham.

Also identified as important research questions relevant to agricultural development are the resurgence of malaria particularly among illegal squatters clearing farms in forest areas, the impact of village water storage programs on Aedes mosquito populations (The vector for dengue fever), and the relation of the rural diet to occurrence of bladder stones.

Major constraints on research are shortage of staff, lack of adequate funds, and unavailability of scientific literature. All staff have basic knowledge of research design but they would like to have the opportunity for advanced graduate training. The shortage of funds forces a concentration on discrete, small-scale research projects. Especially needed is money to hire temporary technical assistants to help collect, process and analyse data. Library facilities are very limited with only a few journals available. Staff planning a new project are thus forced to go to Bangkok to do background literature reviews in the much better libraries in the capital. Despite these limitations, the atmosphere in the Department of Community Medicine appears to be a favorable one for research.

Faculty of Nursing

The Faculty of Nursing is one of the oldest faculties at KKU, having been established in 1971. It is divided into 7 Departments: Nursing; Nursing Education, Research and Nursing Administration; Midwifery Nursing; Maternal-Child Nursing; Psychiatric Nursing; Public Health Nursing; and Medical-Surgical Nursing.

The Faculty offers 2 programs of study: a 4 year Bachelor's of Science in Nursing and a 2 year Bachelor's of Arts in Nursing. 140 students are admitted each year in the B.S. Program.

All students are required to do independent study projects, most of which are related to social science. Third year students must spend seven weeks during the hot season vacation at a District Hospital. They use the hospital as a base from which to carry out research on health conditions in surrounding villages. Fourth year students must spend 2 months doing the same sort of village studies. The village field program is jointly supervised by staff from the Departments of Public Health Nursing, Maternal and Child Nursing, and Psychiatric Nursing. This year students are working in 7 villages in 7 districts. Students must write reports on their findings with copies kept on file in the Faculty Office.

In addition to supervising student research, staff are engaged in several social science related projects of their own:

- A study of diet patterns of patients in the Northeast. This one year project, which has not yet commenced, will survey food consumption patterns in 15 villages throughout the Northeast. Funded from KKU research funds.
- Study of factors influencing health services of Khon Kaen people. (in progress).
- Study of factors relating to birth weight of babies in Khon Kaen. (in progress)

Major limitations on staff research appear to be:

- (1) Time. Staff are heavily involved in teaching and supervision of students. During the hot-season vacation, staff must spend most of their time supervising student village field work.
- (2) Lack of expertise in research design. Some staff have attended research methods workshops run by the NRC/SSRC but still feel underqualified to design field research projects.

ADMINISTRATIVE ANALYSIS

KKU has a history of successful experiences in administering research funds from a number of foreign agencies including IDRC, CIDA, Ford Foundation and other governments. The establishment of the Research and Development Institute is additional evidence of KKU's commitment to research and a major effort in organizing itself to attract and manage large research grants. The Director of RDI is an energetic individual with an excellent reputation as a researcher and administrator.

In 1980 KKU received authorization from the Ministry of University Affairs to establish the Institute for Research and Development. The primary purpose of the Institute is to coordinate, facilitate, administer and extend research activities. In particular, the Institute is intended to play a coordinating role when projects cut across a number of faculties. It is envisioned that RDI, in its role as a coordinator can bring together weaker research faculties with those which are stronger (as well as outside research entities) to strengthen the research capacities of both faculties. Research projects that are within a single department or involve two or more departments within a single faculty will continue to be the responsibility of the concerned department or faculty, respectively. Finding other sources of research funding (both Thai and foreign donor sources) will be another important role to be performed by the Institute.

The organizational chart in Figure C-5 shows five sections making up the RDI. The Research and Evaluation Section is primarily responsible for the coordination of research activities within the KKU. The functions of Administrative and Information/Publication Sections are self-explanatory. The Training Section's function is to arrange, coordinate and conduct research methodology and research application training for researchers, field workers, extension agents and others. The Coordination Section is envisioned to play a liaison role with outside government, non-government,

business, private and voluntary organizations. The two sections expected to shoulder major responsibilities for AID funded grant activities, are the Research and Evaluation, and Administration Sections.

The staff of the Institute currently includes a Director (appointed October 1982), 4 researchers, 1 secretary and two borrowed typists. Three researchers are assigned to the Research and Evaluation Section. The Institute is presently (March, 1983) involved in two research projects and limited evaluation activities. It appears that RDI is adequately staffed for purposes of coordinating research activities. The Institute, however, lacks basic administrative staff to support project activities. In addition, the Institute needs to develop a financial and administrative system that provides for efficient management of projects which may be funded from a variety of sources. It specifically needs to develop accounting, procurement and contracting capability within the Institute.

Under this Project, RDI is expected to perform a series of functions as the KCU project management unit. The first and foremost function of RDI will be to solicit well conceptualized research proposals (within the framework of the Project) particularly from faculties, departments, individuals within the KCU and outside entities (other than the Farming Systems Group) in the area of rural development. To attract attractive proposals will require wide dissemination of yearly information through advertisements, personal contacts and by other means which should not pose any difficulty. Upon receipt of proposals, the RDI research staff will pre-screen them and make arrangements for the formal screening proposals by one of two approval committees, i.e., Farming Systems Research Advisory Committee and Rural Development Research Committee. These Committees do not currently exist and will need to be established (an initial CP) either prior to or soon after the Agreement is signed. In the area of processing research proposals, the RDI will have to develop detailed operating/administrative procedures. This management capability is expected to evolve over a period of time with outside technical assistance.

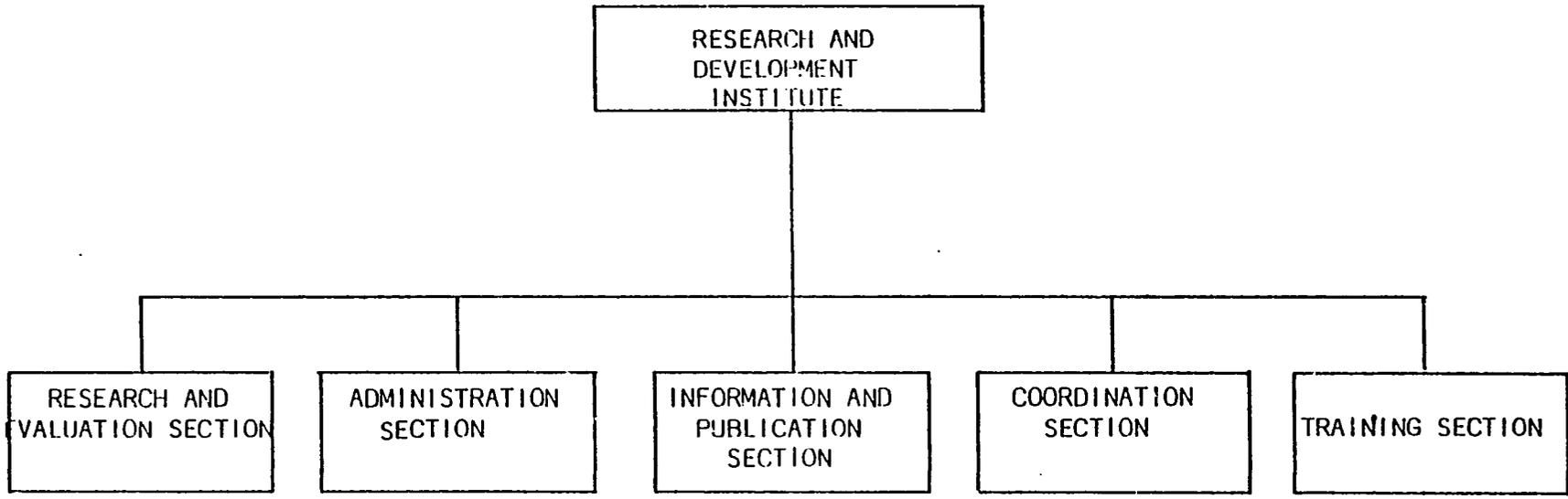
Under the Project, RDI is charged with the responsibility of receiving grant and counterpart funds from USAID and DTEC, disbursement of these funds in support of research activities and the compilation of financial and other periodic reports for submission to USAID/DTEC. The financial and administrative staffing needs of RDI have been discussed with KKU and DTEC officials. The Institute requires a finance manager, an administrative manager, three project administrative assistants, and one driver/messenger to staff up its Administrative Section. KKU officials are optimistic about getting these additional positions approved from the Civil Service Commission and obtaining budgeted funds to support them in the future. Both USAID and DTEC have agreed to initially finance these staff costs under the Project on a cost share basis. While USAID will be responsible for the project related travel costs of the RDI administrative staff through the life of the project, DTEC agrees to pick up the salary costs of all 6 positions in the first year, 4 positions in the second year, and 2 positions in the third year. By the fourth year of the project, KKU will be responsible to fund all staff positions from its own resources. The recruitment of qualified administrative staff is established as an initial Condition Precedent in the Project Paper.

In addition to staffing, USAID has agreed to fund necessary technical assistance to provide guidance to RDI staff in setting up an adequate accounting and administrative system. Grant funds will be used to finance consultancy support to help develop adequate financial capability within RDI. To the maximum extent possible, RDI will use KKU's existing financial control mechanism in the administration of grant funds.

KKU/RDI has limited or no experience in direct contracting for technical services. USAID has agreed to help RDI in developing acceptable contracting formats for its use. Grant funds will also be used to finance technical assistance to help develop contracting capacity within RDI.

No major procurement of equipment is anticipated under this project. Any minor equipment needed to support a given research project will be procured by each research team using University's existing purchasing mechanism in accordance with AID small value and/or shelf item procurement procedures. The copies of relevant sections on small value and shelf item procurement from AID Handbooks have been given to help RDI in monitoring compliance with these minimal requirements.

Briefly, it had been determined that (with the existing and planned inputs) KKU has the administrative capability in the execution of the project and that the proposed implementation plan is workable.



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TECHNICAL ANALYSIS1. General Constraints

This project is designed to accomplish the following objectives:

- To strengthen the capacity of KKU in order to improve the quantity, quality and relevance of agricultural and rural based research activities carried out by university staff and students.
- To develop the Research and Development Institute as the primary entity responsible for coordinating, facilitating and administering research at KKU.
- To improve the quality of graduates from KKU by ensuring they are exposed to "real world" problems of Northeast villagers.
- To increase KKU's ability to provide research assistance to help RTG rural oriented agencies.

Constraints to accomplishing these objectives include:

a. Institutional Constraints

Historically, Thai universities were conceived as teaching institutions with no research responsibilities. It was not until recently that research was officially made one of the university's function. This lack of RTG support for research forced universities to seek research funding from outside sources. Agricultural universities in Thailand presently receive less than 5% of the national agricultural budget. The need to obtain research funds from outside organizations has tended to lead

to very fragmented research programs and has often resulted in research that is not very relevant to the actual needs of rural communities. At present there is no functioning organization within the university that can coordinate this research nor is there any mechanism that can help direct research by newer faculties toward significant rural problems.

b. Staffing

While there is a relatively strong core of professional staff in the rural technical fields of engineering and agriculture, the number of well trained staff in the social sciences is very limited. As it is also more difficult to find outside research funds for social science research, the small number of social scientists at KKU have had very limited opportunity to engage in meaningful research. Consequently, much of the research at KKU has been technically oriented and has excluded important social considerations. By strengthening the capability of KKU staff to carry out multi-disciplinary research projects, it is envisioned that there can both provide more appropriate agricultural and rural technologies and can better assist RTG rural development agencies.

c. Students

Presently about 62% of the under-graduate students at KKU come from the Northeast. The largest number of students are enrolled in the Faculties of Engineering, Agriculture, Education and Nursing. However, as the new Faculty of Humanities and Social Sciences continues to expand it is envisioned a larger percentage of the students will be enrolled in this faculty. With limited on-going research students do not have an opportunity to be exposed to "real-world" problems of rural communities. This situation often results in graduates that are academically trained but not practically trained and hence their orientation is not toward solving agricultural and rural problems of Northeast Thailand.

d. R&D Institute

In 1980 KKU received authorization to establish the Research and Development Institute (RDI) with a primary purpose to facilitate, coordinate and extend research. Not until late 1982 was a director selected and appointed. However, other than the director, there are still no permanent administrative positions funded by the RTG and therefore the RDI does not have the staff capacity to serve as a focus for research activities at KKU.

2. Project Interventions

The project has a variety of means to overcome these identified constraints. A main thrust is to strengthen the capacity of RDI by helping it recruit, train and utilize the staff required to administer, coordinate and facilitate research at KKU. In combination with the strengthening of RDI the project provides sufficient research funds to allow KKU to develop a cohesive research program focused on agricultural and rural needs of Northeast villagers. In addition, the project is seen as a means of developing the capacity within KKU faculties and RDI to contract for required services and commodities both within Thailand and from abroad.

a. Improving the Institutional Environment

In spite of a historical reluctance within RTG agencies to recognize the competence of university staff, line agencies are increasingly drawing on the skills found at the agricultural universities. This is particularly true in the Northeast where a very limited number of RTG post graduate researchers are posted. The proposal plans to accelerate this cooperation by facilitating both technical and socially sound rural research. By making additional research funds available for rural-oriented research, the proposed grant will serve as a magnet to attract additional RTG research funds to KKU and to demonstrate the value, in terms of increased social well being of such research.

Funneling project funds through RDI will help to develop RDI as the research coordinating and administrating organization that is missing at KKU.

RDI can also serve a major role as a research facilitator both by locating and attracting new funds and by helping newer faculties to direct their research toward important problems in rural Northeast villages.

b. Staff Development

By providing funds for agricultural and rural research the proposal seeks to improve capability of KKU staff to formulate and implement relevant research. In particular, project funds will be directed toward social scientists and their work where there is presently a noticeable lack of research ability and experience.

Project funds combined with counterpart funds from the RTG will help develop additional research skills by providing the necessary resources to send KKU staff for observational and research methodology short-term training at regional sites in Asia (primarily to ICRISAT and IRRI).

The use of farming systems research (FSR) techniques will facilitate the development of multi-disciplinary research approaches and therefore lead to more "real-world" rural oriented projects.

c. Student Involvement

The project's emphasis on student involvement in field and village aspects of the research will lead to better, more Northeast-oriented graduates from KKU. This is especially important for students from the Department of Social Sciences as their present orientation is more academic and less practical. Results of the research will be incorporated back into the curriculum and less materials to even further reinforce the need for rural-oriented courses at KKU.

ECONOMIC ANALYSIS1. Returns to Research

The major thrust of this project is to assist KKU strengthen its institutional capability to administer, facilitate, coordinate and conduct research appropriate to Northeast rural communities. In the long term, it should help to improve the welfare of rural communities in the Region. Given that the research activities to be undertaken in the project are not directly revenue producing the standard benefit-cost analysis is not appropriate in this case, however, the project plans to utilize a screening mechanism to ensure that only promising themes which support the objective of this project are selected.

There has been a significant amount of research undertaken around the world showing the economic returns resulting from investments in research. One of the earliest attempts to measure the social and economic benefits resulting from investments in agricultural related research was carried out by Zvi Griliches who showed a 35-45 per cent return to investments in hybrid corn research in the United States. ^{1/} Table 1 shows summaries of studies as presented by Arndt and Ruttan ^{2/} indicating, generally, a high return for investments in agricultural research worldwide. Since all of these studies have been conducted after the research was completed or ex post, it is not possible through conventional economic analysis to arrive at a social rate of return for the Khon Kaen University Research Development Project. It is reasonable, however, to ask what alternative strategies could be employed to attain the projects objectives.

^{1/} Griliches, Zvi, "Hybrid Corn: An Exploration in the Economics of Technological Change", *Econometrica* 25: 501-22, October 1957.

^{2/} Arndt, T.M. and Ruttan, Resource Allocation and Productivity in National and International Research, University of Minnesota Press, 1977.

Table 1. Summary of Direct Cost-Benefit Type Studies of Agricultural Research Productivity

Study	Country	Commodity	Time Period	Annual Internal Rate of Return (%)
Grilios (1958)	U.S.A.	Hybrid corn	1940-55	35-40
Grilios (1958)	U.S.A.	Hybrid sorghum	1940-57	20
Peterson (1966)	U.S.A.	Poultry	1915-60	21-25
Evenson (1969)	S. Africa	Sugarcane	1945-62	40
Ardito Barlotta (1970)	Mexico	Wheat	1943-63	90
Ardito Barletta (1970)	Mexico	Maize	1943-63	35
Ayer (1970)	Brazil	Cotton	1924-67	77
Schmitz & Sooklor	U.S.A.	Tomato harvest with no compensation to displaced workers	1958-69	37-46
		Assuming compensation of displaced workers for 80% of earnings loss		16-28
Hines (1972)	Peru	Maize	1954-67	35-40* 50-55**
Hayami & Akino (1975)	Japan	Rice	1915-50	25-27
Hayami & Akino (1975)***	Japan	Rice	1930-61	73-75
Hertford, Ardila, Hocha, & Trujillo (1975)***	Colombia	Rice	1957-72	60-82
	Colombia	Soybeans	1960-71	79-96
	Colombia	Wheat	1953-73	11-12
	Colombia	Cotton	1953-72	None
Paturoon & Fitzharrio (1975)***	U.S.A.	Aggregato	1937-42	50
			1947-52	51
			1957-62	49
			1967-72	34

* Returns to maize research only.

** Returns to maize research plus cultivation "package".

*** From paper presented at Conference on Resource Allocation and Productivity in National and International Agricultural Research, Agricultural Development Council, Research and Training Network program, Airlie House, Virginia, January 26-29, 1975.

2. Alternative Solutions

Alternatives were considered by the design team and were subsequently rejected because they were either too expensive or ineffective:

a. One possible alternative would be to have Kasetsart University in Bangkok, the leading agricultural university in Thailand, do the location specific research called for in this project. If only local TA was used, this alternative would most likely be less expensive than that being proposed in this project (which proposes a mix of foreign and local TA). However, Kasetsart University is not a regional institution and has no mandate to support the RTG's emphasis on regionalization and decentralization of government activities other than those which apply to them. For these reasons, the alternative was rejected.

b. A second alternative would be to use Northeast Regional Office of Agriculture and Cooperatives (NEROAC), the MOAC leading implementing entity rather than KKU, both of which are physically located in Khon Kaen Province. It was decided to build upon the existing professional staff capacity at KKU rather than pursue a more long term program involving the development of such a research capacity within NEROAC which does not have the professional research staff to conduct research nor the mandate to do so. Moreover, NEROAC's development interests are limited to agriculture. In fact USAID supported NEROAC for a period of ten years (1965-1975) with the hope of creating a regional research entity. Shortly after the project terminated, the MOAC made NEROAC a coordinating entity of all RTG/MOAC activities eliminating all reference to conducting research. On the other hand, KKU has been designated as the regional agricultural university for the Northeast. Through its facilities and core staff KKU has the critical mass required to do such research and focus on such problems. Its physical capacity is now pretty well in place as well as having the ability to recruit and hold a young professional staff. The net result is that it

would be less expensive to concentrate project support at KCU rather than starting from a much lower base at NEROAC. KCU's philosophy of assisting the small Northeastern farmers through a pragmatic/basic needs approach makes KCU a better choice.

c. The final alternative to this project's approach would be to have the RTG engage an international organization such as ICRISAT OR IRRI in a contractual arrangement to provide research services called for under this proposal. The major drawback on this approach is that it would be more expensive, less likely to develop a local capacity and would not be consistent with the various center's mandate as international research centers. Additionally, such an arrangement would not focus on the development of an RTG capacity nor promote the desired decentralization. For these reasons, it, too, is rejected.

3. Areas of Cost Effectiveness

Since it is not possible to measure the economic benefits before the project is undertaken, the design team has attempted to design the project in ways which would minimize cost. The following are factors the design team considered in attempting to design the project in the least cost manner.

a. In choosing the FSR approach as a means to improve farmer well-being, the team felt that while the "top down" approach (which characterizes MOAC research) to developing improved technologies is relevant to a portion of the farmer-population and complements FSR, it, by itself, is not a cost-effective way of addressing the problems of small farmers in more disadvantaged and remote agricultural areas. For a variety of reasons, the benefits of such approaches simply have not reached the small farmers in these areas. In terms of "technology adopted per monetary unit spent" the FSR research proposed in this project may therefore be more cost-effective in reaching rural communities than the traditional approach to technology development.

b. The research procedures and methodologies which have been and will be selected for implementation in this project have been chosen with the idea of reducing costs as much as possible. Efforts have been made to utilize procedures that are practical and inexpensive. It is not anticipated, for example, that the initial baseline studies will require complex procedures and highly qualified personnel to collect and analyze the data. Sophisticated computer modelling techniques are not required. It is hoped that by keeping the procedures as straightforward and as simple as possible that the time and resources required for moving through the various stages of the program will be minimized and costs will be reduced. Moreover, it is anticipated that a minimal amount of scientific equipment will be required in research to be conducted under this project.

FINANCIAL ANALYSIS

The total project cost is estimated at \$3,447,000. The USAID grant contribution is set at \$2,000,000, DTEC's counterpart funding is estimated at \$152,000, and KKU's in-kind and budgetary support is calculated at \$1,295,000. These cost estimates are based on the distribution of planned inputs in Table 1, 10 per cent inflation rate per year over basic unit/person month cost in FY 1984, and other assumptions and analysis as follows:

1. Staff Salaries (KKU)

- a. Number of personnel involved in research = 100
- b. Average per month salary cost @ Bht.6,000 = Baht 600,000
- c. Time devoted to project activities = 40%
- d. Base per month staff cost of the project (600,000 x 0.40) = Baht 240,000

2. Office Space (KKU)

- a. Space required for project activities = 400 Sq.m.
- b. Per square meter rental cost per year = Baht 200
- c. Base per year rental cost to the project (200 x 400) = Baht 80,000

3. Equipment

Existing Equipment (KKU)

- a. Estimated total cost of existing equipment = Baht 3,000,000
- b. Estimated useful life of this equipment = 10 years
- c. Use of this equipment in the project = 50 per cent
- d. Base per year cost to the project
= $3,000,000 - 10 = 300,000 - 2$ = Baht 150,000

4. Construction (KKU)a. Farming Systems Research Building

(1) Addition required to the existing building	=	600 sq.m.
(2) Estimated construction cost per sq.m.	=	Baht 5,000
(3) Furniture costs	=	Baht 600,000
(4) Air-Conditioning	=	Baht 800,000
(5) Contingency	=	Baht 600,000
(6) Sub-Total (600 x 5,000 = 3,000,000 + 600,000 + 800,000 + 600,000)	=	Baht 5,000,000

b. Livestock Barn

(1) Space required	=	500 sq.m.
(2) Construction cost per square meter	=	Baht 1,000
(3) Sub-Total (500 x 1,000)	=	Baht 500,000

5. Farming Systems Research (AID) = \$800,000

This total includes both inflation and contingency.

6. Rural Development Research (AID) = \$700,000

This total is inclusive of both inflation and contingency.

7. U.S. Technical Assistance - Short-Terma. Foreign Exchange Costs (AID)

(1) International Travel	=	\$2,500
(2) Consultants Fee: 21 days x @ \$200/day	=	\$4,200
(3) Miscellaneous	=	\$ 200
(4) Base per month cost	=	<u>\$6,900</u>

b. Local Currency Costs (DTEC)

(1) In-Country Trips: (2/month x 2,000 each)	=	Baht 4,000
(2) Per Diem: (30 days x 650 per day)	=	Baht 19,500
Base Per Month Cost:	=	<u>Baht 23,500</u>

8.	<u>Local Consultants - Short-Term*</u>	
	a. <u>Local Currency Costs (AID)</u>	
	- Consultant fee (20 days x @ Baht 300/day)	
	Base Per Month Cost:	Baht 6,000
	b. <u>Local Currency Costs (DTEC)*</u>	
	(1) Local travel: (2 trips x @ Baht 2,000)	Baht 4,000
	(2) Per Diem: (30 days x @ Baht 600)	<u>Baht 18,000</u>
	Base Per Month Cost:	<u>Baht 22,000</u>
9.	<u>RDI Support Staff*</u>	
	<u>Salary (DTEC)</u>	
	a. Finance Manager	Baht 4,000
	b. Administrative Manager	Baht 4,000
	c. Project Administrative Assistant - Three	Baht 3,300
	d. Driver/Messenger	Baht 2,000
	<u>Project Related Travel (AID) - two trips per month</u>	Baht 4,800
10.	<u>Training - Short-Term (Regional)</u>	
	a. <u>Foreign Exchange Costs (AID)</u>	
	Training + other expenses (per month)	\$1,800
	b. <u>Local Currency Costs (DTEC)</u>	
	Participant travel (round-trip per person)	Baht 10,000
11.	<u>Workshops (On Campus)</u>	
	Base cost per workshop (local currency equivalent)	\$4,000
12.	<u>Publications</u>	
	Average publication cost of selected work (local currency equivalent)	\$1,000
13.	<u>Evaluation</u>	\$27,500

The estimated cost figure for each evaluation is a rough estimate. The actual costs will vary with the composition of the team and the duration of each evaluation.

*RDI/KKU will use DTEC or KKU rating for payment of these costs.

Table 1

INPUTS REQUIREMENT SCHEDULE

Inputs	FISCAL YEAR							Total
	83	84	85	86	87	88	89	
1. Staff Salaries--100 persons	3	12	12	12	12	12	9	72
2. Office Equipment (person months)	3	12	12	12	12	12	9	72
3. Equipment Use (person months)	-	12	12	12	12	12	9	69
4. Construction	-	-	X	-	-	-	-	-
5. Farming Systems Research (projects)	-	6	8	7	7	6	3	37
6. Rural Development Research (person months)	-	3	6	7	7	6	3	32
7. U.S. Technical Assistance (person months)	-	5	5	5	5	5	-	25
8. Local Consultants (person months)	4	20	15	11.5	11.5	9	5	76
9. RDI Staff Support								
Salary:								
a. DTEC (person months)	18	72	48	24	-	-	-	162
b. KKU (person months)	-	-	24	48	72	72	72	288
Projected Related Travel	12	10	10	8	8	8	8	64
10. Training (person months)	-	-	5	5	5	5	-	20
11. Workshops (number)	-	2	2	2	2	1	1	10
12. Publications (number)	-	-	-	5	5	6	5	21
13. Evaluations (number)			X				X	2

Table II
AID Commitment Schedule*
 (U.S. \$000)

Inputs	FISCAL YEAR							Total
	83	84	85	86	87	88	89	
1. Farming Systems Research	-	125	175	150	150	125	75	800
2. Rural Development Research	-	75	125	150	150	125	75	700
3. U.S. Technical Assistance	-	35	38	42	46	51	-	212
4. Local Consultants	4	19	11	9	9	7	4	63
5. RDI Staff Support	3	2	2	2	2	2	3	16
6. Training	-	-	9	10	11	12	-	42
7. Workshops (On Campus)	-	8	9	10	11	6	6	50
8. Publications	-	-	-	5	5	6	5	21
9. Evaluation	-	-	5	-	-	-	50	55
10. Contingency (RDI)	3	7	7	7	7	7	3	41
Grand Total	10	271	381	385	391	341	221	2,000

* 15% shifts among line items is allowed and no restriction on moving funds between years.

Table III
DTEC Counterpart Fund
 (Baht 000)

Inputs	FISCAL YEAR							Total
	83	84	85	86	87	88	89	
1. Farming Systems Research	-	-	-	-	-	-	-	-
2. Rural Development Research	-	-	-	-	-	-	-	-
3. U.S. Technical Assistance	-	118	129	142	156	172	-	717
4. Local Consultants	88	440	363	306	337	290	177	2,001
5. RDI Staff Support	60	239	166	77	-	-	-	542
6. Training (Travel)	-	-	50	55	61	67	-	233
7. Workshops	-	-	-	-	-	-	-	-
8. Publications -	-	-	-	-	-	-	-	-
9. Evaluation	-	-	-	-	-	-	-	-
10. Contingency (RDI)	-	-	-	-	-	-	-	-
Grand Total	148	797	708	580	554	529	177	3,493

Table IV
KKU Contributions
 (Baht 000)

Input	Fiscal Year							Total
	83	84	85	86	87	88	89	
1. Staff Salaries	720	2,880	3,168	3,485	3,883	4,216	3,478	21,830
2. Office Space	20	80	88	97	107	118	97	607
3. Equipment/Supplies	-	150	150	150	150	150	150	900
4. Construction	-	-	5,500	-	-	-	-	5,500
5. RDI Staff Support	-	-	92	152	216	238	261	959
Grand Total	740	3,110	8,998	3,884	4,356	4,722	3,986	29,796

UNITED STATES GOVERNMENT

memorandum

DATE: February 16, 1983

REPLY TO
ATTN OF: John W. Neave, Chief Engineer, O/PES

SUBJECT: Environmental Statement for Khon Kaen University Project

TO: Dr. B. Ali, O/PES

The project is aimed at strengthening Khon Kaen University's ability to conduct and administer research in the fields of Agriculture and Rural Development. Of the \$2.0 million funding, \$800,000 is earmarked for research on farming systems, \$700,000 for research on Rural Development and \$500,000 for other institutional development activities including Technical Assistance and short term training for personnel of the University.

In view of the research orientation of the project, a Categorical Exclusion from further environmental assessment is appropriate under AID's Environmental Procedures 22 CFR 216.2(c)(2)(ii).



John W. Neave
Mission Environmental Officer

Date: 3-16-83

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DESCRIPTION - NORTHEAST THAILANDArea and Population

Northeast Thailand is the largest region in the Kingdom covering more than 170,000 km². It comprises 17 provinces (see Figure 1) subdivided into 196 districts, 1787 counties and 20,828 villages. The region has a population of about 17 million, which constitutes more than one third of the population of the country. There are approximately 2.5 million households in the region.

Physical FeaturesA. Topography

Except for rugged hilly areas along the southern and western boundaries of the region and south of Udon Thani and Sakon Nakhon, the Northeast consists mostly of an undulating plain or plateau tilted gently towards the northeastern corner. To the north and east the region is divided from Laos by the Mekong River. The hills to the south define the boundary between Northeast Thailand and Kampuchea. Runoff from monsoon rains is drained from four fifths of the entire region by the two major rivers, the Chi and Mun, that join near the Kampuchean border and flow into the Mekong in Kampuchea.

B. Geology and Soils

Geologically, the plateau is primarily composed of fine-grained sandstone and shale strata which are overlain in the valley depressions by alluvium and river terrace deposits. Much of the plateau is underlain by salts. Sandstones in the upper strata are highly pervious.

Along the rivers lie the recent alluvial soils with the ustifluvents on the natural levees and the tropaquepts and dystropepts on the adjacent flood plain. The former are fine to medium textured, well drained, and slightly acid; they are used primarily for garden crops and vegetables. The latter are fine textured and poorly drained, and are used for rice cultivation. Both the paleaquults and paleustults are terrace soils, with more clay and a finer texture in the lower horizon than the surface. They are used for rice cultivation. The paleaquults have developed on the lower terraces. They are poorly drained and are saturated with water at certain times during the year. The paleustults are on the higher terraces; they have a low water holding capacity and are dry for more than 90 days in the year. Upland crops such as cassava, kenaf, and sugar cane are normally found on these soils.

It should be stressed that the areas indicated are by no means uniform. The majority of the area, over 65%, is covered by paleaquult and paleustults soils. Much of the land is undulating, forming "miniwatershed", with paleaquult soils in the depressions and paleustults on the higher land. Only between the Chi and Mun Rivers and south of the Mun River do tropaquepts, paleaquults, and dystropepts form more or less continuous plains. Figure 2 contains a schematic cross section of soils and topography that illustrates the non-homogeneous nature of the Northeast.

C. Climate and Rainfall

Following the Koppen system almost all of the Northeast is classified as a tropical wet and dry zone having distinct dry season from December to May. The mean temperature of the coolest month is above 18°C and diurnal and annual temperature ranges are moderate. Only in the mountainous areas of Loei provinces in the far Northwest are low temperatures (13°C) found during January.

Rainfall patterns of the Northeast are, to a great extent, dominated both by the annual southwest monsoon and tropical cyclones which originate over the Indian Ocean and the South China Sea respectively. The southwest monsoon brings heavy rains in the early part of the rainy season while heavy rains during the latter parts of the season tend to originate from tropical cyclones of the South China Sea. Usually by early November the rainy season is finished. The end of the rainy season is much more consistent than is the arrival of the southwest monsoon.

Total annual rainfall varies from 1,100 mm. in the south and west to more than 1,800 mm. in the provinces along the Mekong River. Based on isohyets for mean annual rainfall (Figure 3), boundaries can be drawn that divide the Northeast into 3 distinct regions: 1,400 mm. and above to the North and East, below 1,200 mm. to the West, and a central band of 1,200 - 1,400 mm. These divisions, while useful, do not provide all the necessary information as total rainfall, per se, is not the problem. The distribution of rainfall throughout the season and variation from year to year are also extremely critical.

According to International Rice Research Institute (IRRI) scientists, a mean monthly rainfall of 200 mm. represents a critical threshold for rice cultivation in Southeast Asia. From this definition: in the south and southwest there is only one month (September) with more than 200 mm.; in the central band there is a fairly narrow area which has 2-4 months of rainfall over 200 mm.; while only in the north and east are there more than 5 months having over 200 mm. If it is assumed that the 100 mm. isohyet defines the threshold for cultivating field crops, the Northeast divides into two zones with monthly rainfall greater than 100 mm. for 5 months in the top zone and for 6 months in the bottom zone.

Recognizing that irregularity in rainfall during the rainy season is more important in determining crop yields than mean monthly rainfall

quantities, it is necessary to examine the total number of drought days* (calculated for paddy production) occurring during the period from May to October. Again, using this technique, there are three distinct zones in the Northeast. As presented in Figure 4, the zone in the west has more than 100 drought days, while there is a narrow band in the middle with 80-100 drought days, and less than 80 days in the area to the north and east. In general, these zones agree with the zones drawn in Figure 3. The high incidence of drought in the west is probably a rain shadow effect caused by the hills.

D. Water Resources

The Mun and Chi Rivers, which drain the Northeast, and the Mekong River which forms its boundary to the North and East, are the major damable water sources. There are no dams on the Mekong but there are dams on tributaries of the Mun and Chi. For all of the Northeast Thailand, as of 1978, the Royal Irrigation Department (RID) has completed irrigation projects with surface storage capacity of 3,260 million cubic meters (mcm) able to serve 415,000 hectares. In addition, RID has installed pump irrigation to serve 45,000 hectares in the wet season and 8,200 hectares in the dry season. However, it is estimated that only 320,000 hectares are actually irrigated. Included in the surface storage data are 544 small reservoirs (tanks) having a combined storage capacity of approximately 895 mcm. Besides providing water for animals and domestic use, they are estimated to irrigate 137,000 hectares.

It is estimated that if all existing and planned irrigation systems were completed, they would serve no more than 15 percent of the total cultivated area of the northeast. This would still leave 85 percent of the cultivated land and over 82 percent of the total farm families dependent upon rainfed agriculture.

* A drought day is defined as a day during which water depth and available soil moisture are zero.

Land Use

Of the 170,000 km² (17 million hectares) in the Northeast, 5.4 million hectares are in rice lands and 1.4 million hectares are under upland field crops. Vegetables cover 64,000 hectares and fruit trees are planted on 32,000 hectares. The remainder of the agricultural land is in pasture grassland or is left idle.

A. Rice Land

The highest proportion of cultivated land under paddy occurs in the eastern provinces, on the flood plains beside the Mekong River, and in the central, southeastern provinces of Roi Et, Yasothon, Surin and Si Sa Ket (i.e. on the plains along the lower reaches of the Chi and Mun Rivers). In these latter provinces over 90% of the cultivated land is under paddy, even in a drought year such as 1976 or 1977.

Variations in quantities of rice plantings, yields and total production are important factors in determining year-to-year income levels. The most stable areas occur in the north and eastern provinces where the annual mean rainfall is greater than 1,400 mm. The least stable areas occur in the western hilly provinces where rainfall is less than 1,200 mm. per year and there are more than 100 drought days in the May to October period. In the center, Kalasin and Maha Sarakham are moderately stable in all respects, while in the south Buriram is very stable. The most complex patterns are found in Roi Et, Surin, and Si Sa Ket. They have high constant paddy acreage from year to year but very unstable yields and total production. Zones of rice stability are presented in Figure 5. The proportion of paddy land actually planted depends on the occurrence of drought early in the season while yields per land unit are primarily a function of the rainfall pattern later on.

The most important measure of stability for the individual farmer and his family is the annual fluctuation in rice production per capita. If 300 kgs. of paddy per person is considered the normal requirement (NESDB cites a figure of 285 kg. of paddy per person), it appears that in a drought year only 5 provinces (Nongkhai, SaKon Nakhon, Udon Thani, Chaiyaphum and Buriram) meet their subsistence requirement. In a good year, however, all of the provinces, except Loei, are in surplus.

Rice production is split between glutinous and non-glutinous rice. Over most of the region the various ethnic groups prefer glutinous or sticky rice, but in the southern and southwestern provinces non-glutinous rice is preferred. The relative production of glutinous and non-glutinous rice is mapped in Figure 6.

B. Field Crop

Most of the land suitable for field crops is in the western provinces. In these provinces, the land is deeply undulating or mountainous and more appropriate for field and upland crops than for paddy. In the central area of the Northeast, 10 to 25 percent of the cultivated land is also suitable for field crops. This land lies mostly in the shallow undulating land where paddy is grown in the depressions and field crops on the higher land in between. To the east there are only small acreages of field crops.

Cassava, kenaf, and corn are the most important field crops, comprising 95% of the upland crop acreage. Cassava and kenaf are planted throughout the west and center while corn is highly concentrated with more than 90% located in the three provinces of Nakhon Ratchasima, Loei and Si Sa Ket. In 1980 the planted area of cassava in the Northeast exceeded 720,000 hectares with a production of more than 10 million metric tons. Corn planted area was more than 300,000 hectares which produced over 730,000 metric tons of grain. Kenaf was planted on approximately 300,000 hectares.

C. Non-Cropped Areas

· Accurate information on the exact status of non-cropped lands is difficult to obtain. Since the early 1960's, land in rice cultivation has almost doubled and there has also been a significant increase in the amount of land devoted to upland crops. The bulk of new land development has been carried out by individual farmers converting forested uplands in the watersheds and reclaiming swamp and flooded land.

In all of the Northeast planted rice land, alone, has increased by more than 1.9 million hectares since 1962/63. According to the recent Thai Universities Research Associates (TURA) study, 43 percent of the forest reserves in the Northeast have been destroyed (approximately 1.5 million hectares).

Livestock

Farming in the Northeast of Thailand, as in other parts of the country, has been traditionally an integrated farming system, consisting mainly of paddy rice, upland crops and livestock, including poultry. Farmers, who are generally small holders, have integrated their livestock and crop production. Due to the vast area for agriculture in the Northeast, its share in agriculture, especially livestock, has been quite significant. Almost 64 percent of the more than 5 million water buffalo in Thailand are found in this region, while more than 40 percent of the 4.3 million cattle and at least 22 percent of the 5.5 million swine are produced in the Northeast annually.

Buffalo and cattle provide the main source of draft power to crop farming under prevailing rainfed conditions and also represent long-term savings-as well as security of farmers in case of crop failure. Most rice production in the Northeast depends on the use of buffalo and cattle for land preparation, transportation, etc. Buffalo and cattle production is not regarded as a distinct enterprise, rather as an integral part of a crop production system, and many characteristics of crop production systems are reflected in the patterns of bovine use and production. Farm households maintain 1-5 head of buffalo and/or cattle with about 60 percent of the total herd inventory being working animals. In general, most farm households own buffalo while about 40 percent own cattle. These animals are fed mainly on crop residues and native grasses and weeds available in villages and surrounding areas such as fallow paddy fields, upland scrub forests, highway shoulders, communal grazing lands, etc. Buffalo and cattle depend mainly on rice straw and stubble as well as other crop residues such as corn stalks, cassava and kenaf leaves, etc. during the dry season.

Pig production is traditionally associated with rice production where rice bran and broken rice are sometimes used by small farmers as a feed supplement for pigs. Village pigs are generally fed with locally available weeds and crop wastes such as water hyacinth, morning glory, banana stems, grasses, sweet potato vines and tubers, papaya leaves or fruits, etc. Farmers feed only minimum amounts of rice bran or broken rice to pigs and these are usually boiled or mixed with garbage. In some areas pigs are allowed to scavenge around houses and cropping areas near the villages with minimal supplement of rice bran and garbage available. It is estimated that more than 90-95 percent of the total pig production in the Northeast, as well as in Thailand, is produced under these small-scale integrated systems. Only a very small portion of pig production comes from a semi-commercial system where more than 15-20 pigs are raised at one time.

Poultry production in the Northeast is mainly backyard poultry raising, which is also an integral part of small farms and rural households. About 80-95 percent of households in the villages raise some number of the indigenous chickens, ranging from 5 up to 50 birds per household. Chickens are generally raised for cash income and home meat consumption. Village chickens generally scavenge around houses and feed on insects or other feedstuffs. Occasionally, a minimal amount of paddy rice is given to the flocks. It is estimated that not less than 80-100 million birds are produced among rural households in the country and the majority of these are in the Northeast. The number of these chickens, however, are not available in the national statistics due to difficulties in the sampling technique.

It is clear that the per capita number of livestock in the Northeast has not increased during the last 10 years. The 1975-79, livestock statistics indicate a slight fluctuation in the number of buffalo, cattle, and swine. (Table 1-1). With the average rate of human population growth of 2.3-2.5 percent, it is evident that the gap between demand and supply for livestock will continually widen.

Table 1-1: Production of Livestock in the Northeast 1975-79.

Year	(million heads)		
	Buffalo	Cattle	Swine
1975	3.459	1.636	0.832
1976	3.674	1.729	0.799
1977	3.665	1.752	0.806
1978	3.830	1.769	1.222
1979	3.838	1.733	0.749

Source: Office of Agricultural Economics, MOAC

Human Population

The population of the Northeast is estimated at 17 million people, about one third of the total population of the Kingdom. The majority of the population belong to Phaw-Thai (Thai Isan) who migrated into the Northeast from Laos and the left bank the Mekong River over the past few hundred years. There are seven distinctive sub-groups, the largest being the Laos Wieng who are located in the center and northeast of the region. The second largest group is the Thai-Korat, numbering 3 million, located in the southwest. The region also contains nearly 0.5 million Khmer in the three southern provinces. Average population density is 88 per km² (88 per km² for the whole Kingdom), but the provinces of Maha Sarakham, Roi Et, Surin and Si Sa Ket, which contain the plains along the lower reaches of the Mun and Chi Rivers, also have districts greater than 100 km². Average family size is 6.5 persons per family with a population growth rate of approximately 2.5 percent per year.

About 80% of the population have completed only primary school (Prathom 4) but educational facilities have increased rapidly in the last ten years. There are 1,100 secondary schools; mostly in district or provincial centers. Institutes of higher education, including 2 universities, 6 teacher training colleges and 8 agricultural colleges, are located in all but two provinces.

Figure 1. The Northeast Region Showing Changwat (Provincial) Boundaries



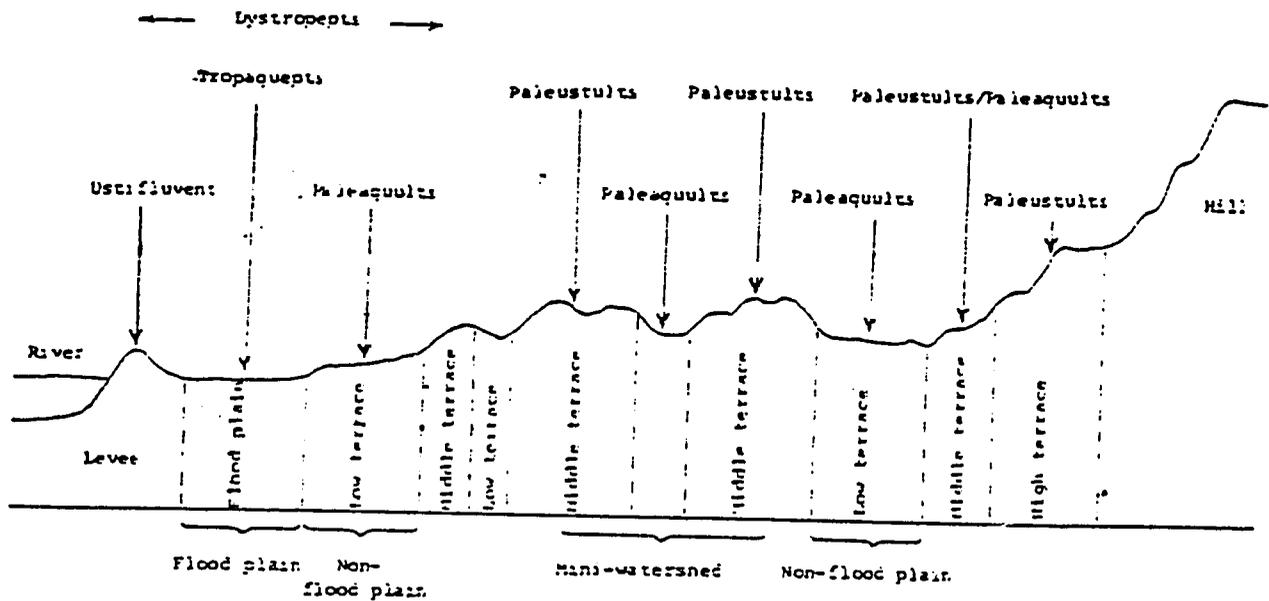


Figure 2. Schematic Cross Section of Topography and Soils in the Northeast.

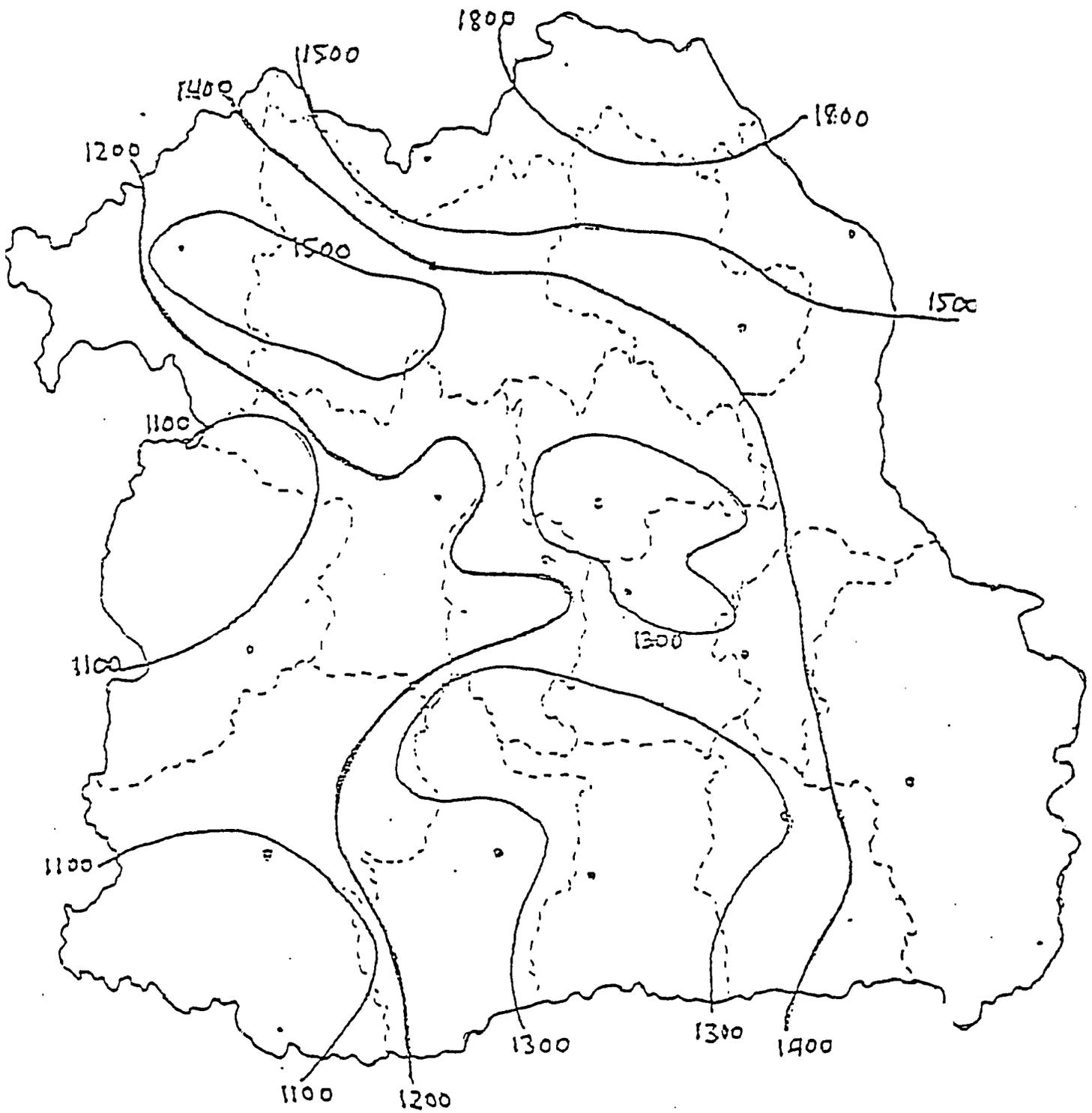


Figure 3 - Isohyets for the Annual Rainfall

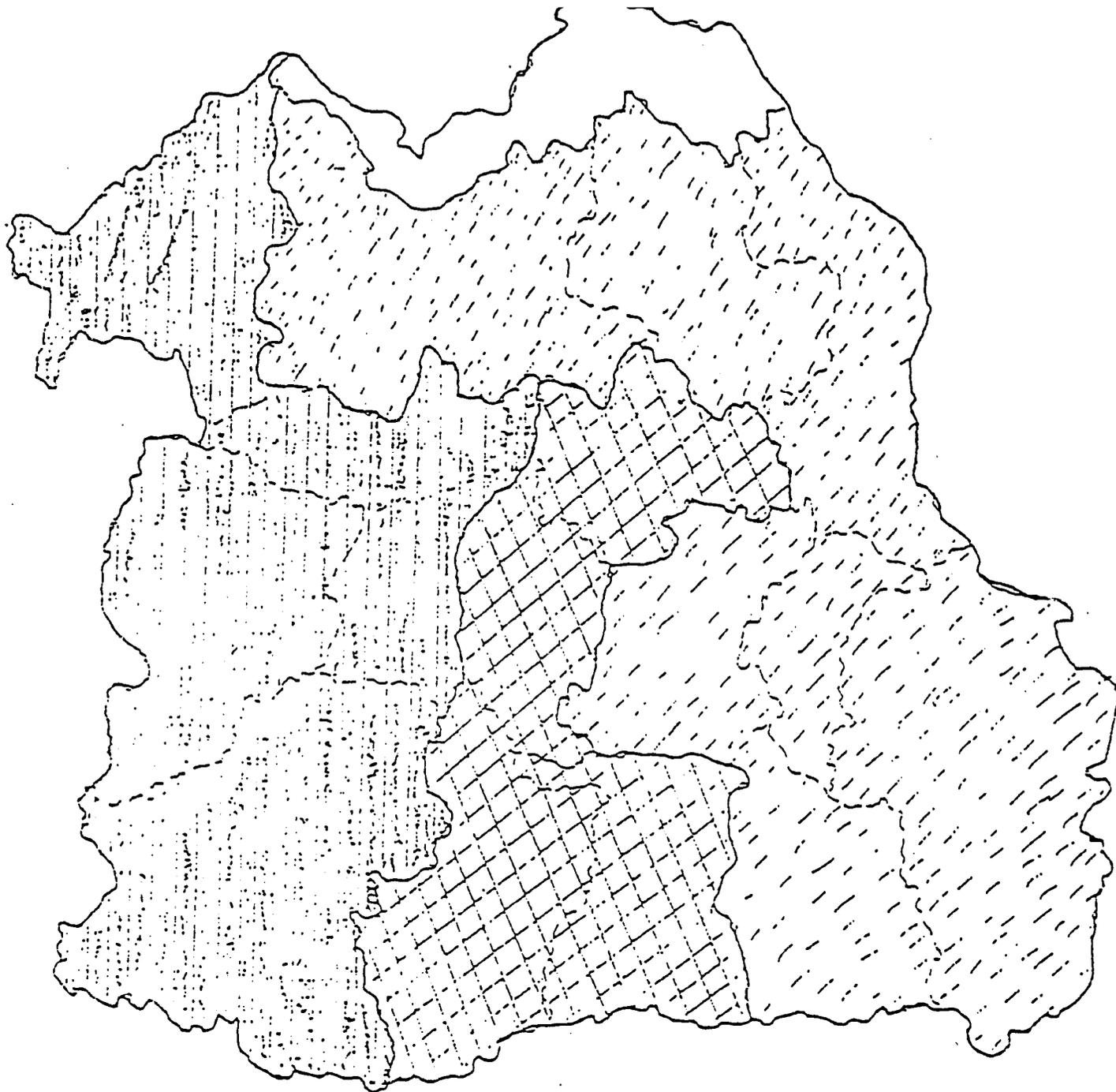
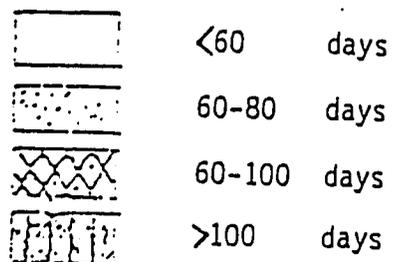


FIGURE 4 - NUMBER OF TOTAL DROUGHT DAYS* FOR THE PERIOD OF MAY TO OCTOBER.



*Drought day - calculated for paddy

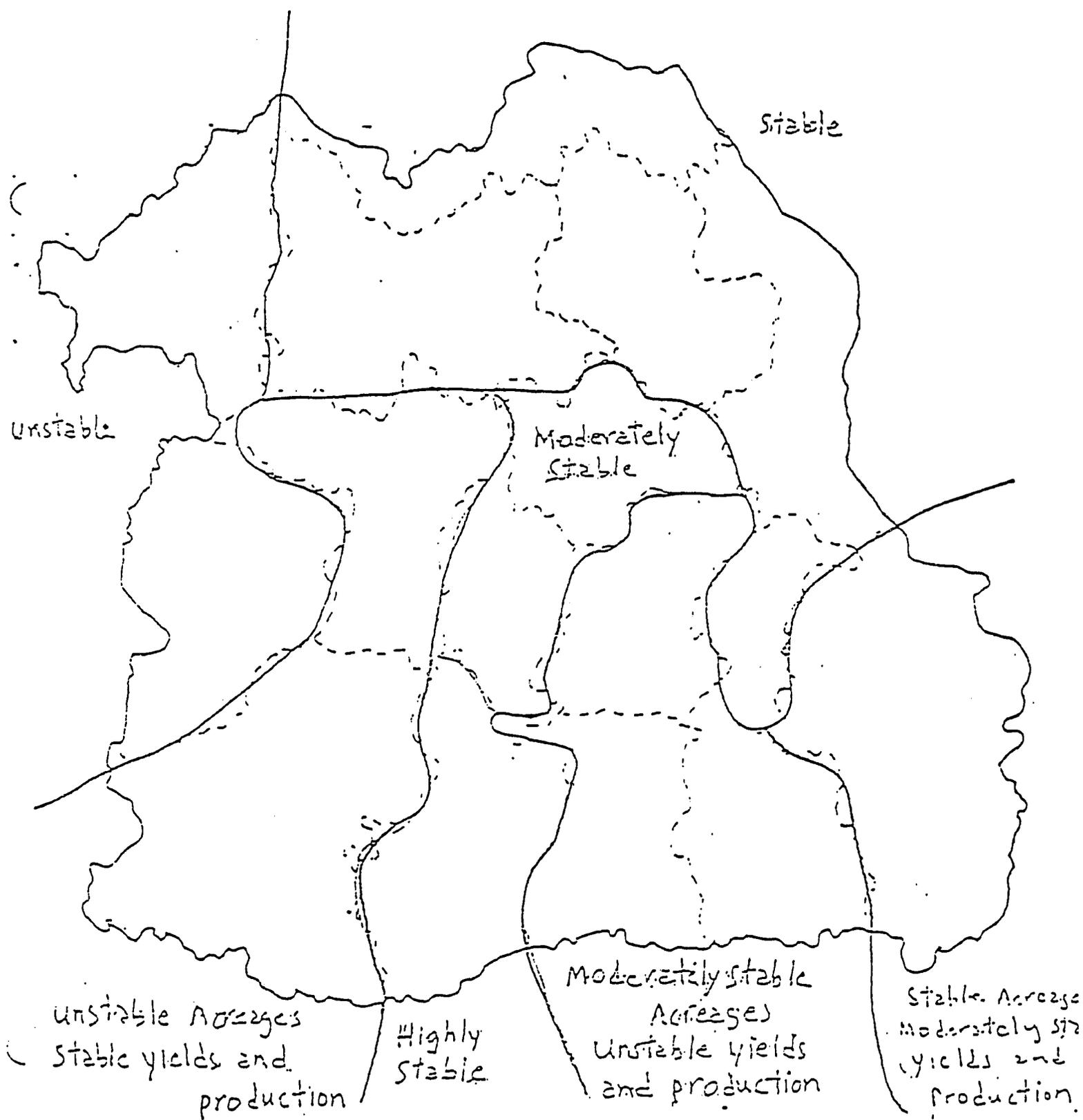


Figure 5 - Zone of Rice Production Stability

88% OF RICE GROWN
IS GLUTINOUS

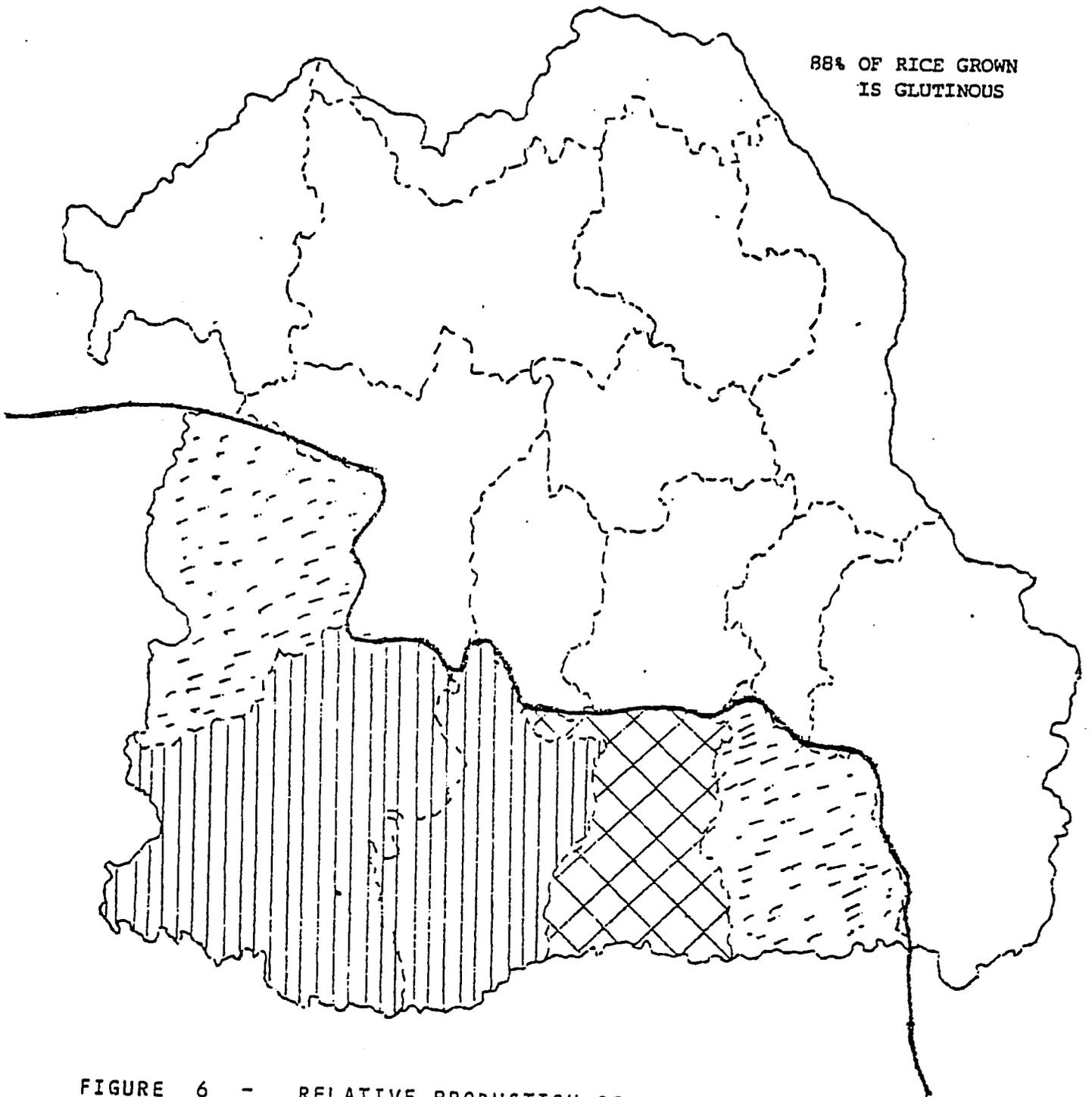
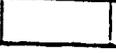


FIGURE 6 - RELATIVE PRODUCTION OF GLUTINOUS AND
NON-GLUTINOUS RICE GROWN

-  > 90% OF RICE GROWN IS NON-GLUTINOUS
-  > 50% OF RICE GROWN IS NON-GLUTINOUS
-  > 30% OF RICE GROWN IS NON-GLUTINOUS
-  > 88% OF RICE GROWN IS GLUTINOUS

CHECKLIST OF STATUTORY CRITERIA
PROJECT CHECKLIST

A. GENERAL CRITERIA FOR PROJECT

1. FY 1982 Appropriation Act Sec. 523; FAA Sec. 634A; Sec. 653(b).

(a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project;

(a) Via Congressional Notification which will be forwarded to Committees.

(b) Is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that amount)?

(b) Yes.

2. FAA Sec. 611 (a)(1). Prior to obligation in excess of \$100,000, will there be

(a) engineering, financial or other plans necessary to carry out the assistance and

(a) Technical and Financial Analyses have been prepared. See Annex D & F of Project Paper.

(b) a reasonably firm estimate of the cost to the U.S. of the assistance?

(b) Yes, same as above.

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance.

No further legislative action required.

4. FAA Sec. 611(b); FY 1982 : N/A
Appropriation Act Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for planning Water and Related Land Resources, dated October 25, 1973?
5. FAA Sec. 611 (e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistance Administrator taken into consideration the country's capability effectively to maintain and utilize the project? N/A
6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. The project is a collaborative effort with the Japanese Government, in consultation with the RTG, directed at improving research in Northeast Thailand. USAID assistance is being directed at KKU and Japanese toward MOAC.
7. FAA Sec. 601 (a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. The project is directed at improving the research capability of KKU. It will hopefully provide improved agricultural technology which in turn will improve technical efficiency. Project will probably not increase flow of international trade, foster private initiative or encourage cooperative development, or strengthen free labor unions.

8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). The Project will provide limited opportunities for U.S. private trade and investment.
9. FAA Sec. 612(b); Sec. 636(h) FY 1982 Appropriation Act. Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the United States are utilized in lieu of dollars. The RTG's contribution to this project is \$1.45 million which will exceed 25% of total requirement.
10. FAA Sec. 612(d). Does the United States own excess foreign currency and, if so, what arrangements have been made for its release? There are no U.S. owned local currencies available for this project.
11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? Yes.
12. FY 1982 Appropriation Act Sec 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity? No.

13. FAA 118(c) and (d). Does the project take into account the impact on the environment and natural resources? If the project or program will significantly affect the global commons or the U.S. environment, has an environmental impact statement been prepared? If the project or program will significantly affect the environment of a foreign country, has an environmental assessment been prepared? Does the project or program take into consideration the problem of the destruction of tropical forests.

The project will have no significant impact on the environment, natural resources or global commons, and will not affect tropical forest.

14. FAA 121 (d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipts and expenditure of project funds (dollars or local currency generated therefrom)?

N/A

Further Continuing Appropriations Act of 1983, Section 133.

Notwithstanding any other provision of this joint resolution, none of the funds appropriate under section 101(b) of this joint resolution may be available for any country during any 3-month period beginning on or after October 1, 1982, immediately following the certification of the President to the Congress that such country is not taking adequate steps to cooperate with the United States to prevent narcotic drugs and other controlled substances [as listed in the schedules in section 202 of the Comprehensive Drug Abuse and Prevention Control Act of 1971 (21 U.S.C. 812)] which are produced, processed, or transported in such country from entering the United States unlawfully.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria.

a. FAA Sec. 102(b); 111; 113; 281(a). Extent to which activity will:

(a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions;

(b) Help develop cooperatives, especially b technical assistance, to assist rural and urban poor to help themselves toward a better life, and otherwise encourage democratic private and local governmental institutions;

(c) support the self-help efforts of developing countries;

(d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and

(e) utilize and encourage regional cooperation by developing countries.

(a) Research criteria established in the project are directed involving poor farmers increasing production, using appropriate technology, etc.

(b) Project directed at research at rural based communities.

(c) Project considers self-help efforts as well.

(d) No differential effect on women is foreseen

(e) N/a

- b. FAA Wec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used? Yes
- c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)? Yes
- d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)? Yes
- e. FAA sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? No, this grant does not provide capital assistance.
- f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth? Yes, economic growth will increase as research findings are made available to farmers.

- g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.

The project is designed to find ways to increase farmer productivity through agriculture and rural research. This research will draw on the farmers knowledge and experience plus the expertise of a major educational institution, will improve access to and use of new information; the project will improve the teaching capability of a major regional university which will provide people for government service thereby improving the quality of bureaucrats participating in governmental processes.

z. Development Assistance Project Criteria (Loans Only)

- | | |
|--|-----|
| a. <u>FAA Sec. 122(b)</u> . Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest. | N/A |
| b. <u>FAA Sec. 620(d)</u> . If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan? | N/A |
| c. <u>ISDCA of 1981, Sec. 724(c) and (d)</u> . If for Nicaragua, does the loan agreement require that the funds be used to the maximum extent possible for the private sector? Does the project provide for monitoring under FAA Sec. 624(g)? | N/A |

3. Project Criteria Soley for
Economic Support Fund

- a. FAA Sec. 531(a). Will this assistance promote economic or political stability? To the extent possible, does it reflect the policy directions of Section 102? N/A
- b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities? N/A

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DEPARTMENT OF TECHNICAL AND ECONOMIC COOPERATION
Krung Kasem Road, Bangkok, Thailand
Cable: DTEC.
TEL. 817555

No. 1803(1)/14255

C&R RECEIVED

May 9 , B.E. 2526

12 MAY 1983

Mr. Robert Halligan
Director
USAID/Thailand
37 Soi Somprasong 3
Petchburi Road
Bangkok 10400, Thailand

Subject: Khon Kaen University (KKU) Research Development

Dear Mr. Halligan:

This is to inform you that we have reviewed the subject Project Paper and are in complete agreement with the proposed project description, financial plan and the implementation arrangements. It is understood that DTEC is to make direct cash advances to KKU of its share of the project costs, in accordance with the project cash requirements by quarter, as detailed in the financial and research plans.

We, therefore, formally request that a grant of \$2,000,000 be provided by USAID for this six year project. The RTG agrees to contribute up to Baht 32.9 millions (\$1,432,000) towards the estimated project cost.

Your kind cooperation is much appreciated.

Sincerely



Apilas Osatananda
Director-General

USAID Sub-Division

DEC - I

Tel. 2810966, 2813963

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PROJECT AUTHORIZATION

Country : Thailand
Project Title : Khon Kaen University Research Development Project
Project Number : 493-0332

Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Khon Kaen University Research Development Project for the Kingdom of Thailand involving planned obligations of not to exceed Two Million United States Dollars (US\$2,000,000) in grant funds over a one year period from date of authorization to help in financing foreign exchange and local currency costs for the project. The planned life of the project is six years from the date of initial obligation.

The project is designed to strengthen the institutional capacity of Khon Kaen University to conduct research appropriate to Northeast Thailand rural communities. The grant funds will be used to finance research operations, short-term consultants, short-term study tours, certain staff support costs, in-country workshops, publications, evaluations and operating costs of the project. Funds may also be used to finance other activities pertaining to the strengthening of the Khon Kaen University's Research and Development Institute.

The Project Agreement which may be negotiated and executed by the officer(s) to whom such authority is delegated in accordance with AID Regulations and Delegations of Authority, shall be subject to the following essential terms, covenants and major conditions, together with such other terms and conditions as AID may deem appropriate:

a. Source and Origin of Goods and Services

Goods and services, except for ocean shipping financed by A.I.D. under the project shall have their source and origin in Thailand or in the United States except as A.I.D. may otherwise agree in writing. Ocean shipping financed by AID under the grant shall, except as AID may otherwise agree in writing, be financed only on flag vessels under flag registry of the United States.

b. Source/Origin Waiver

Pursuant to the authority granted to me by Redelelegation of Authority 40.10 (Revised), I hereby authorize the use of approximately \$42,000 of grant funds for procurement of training and consultant services from countries included in Code 941 of the A.I.D. Geographic Code Book.

Robert Halligan

Robert Halligan, Mission Director

June 2, 1983

Date