A.I.D. EVALUATION SUMMARY PART I

(BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS) PD-AAT-771

45872

A. REPORTING A.I.D. UNIT (Mission or AID/W Office)
USAID/Thailand
(ES #

B. WAS EVALUATION SCHEDULED IN CURRENT FY ANNUAL EVALUATION PLAN?
yes [X] slipped [ ] ad hoc [ ]

C. EVALUATION TIMING
interim [X] final [ ] ex post [ ] other [ ]

D. ACTIVITY OR ACTIVITIES EVALUATED (List the following information for project(s) or program (s) evaluated; if not applicable, list title and date of the evaluation report)

Project	Project/Program Title (or title & date of evaluation report)	First PROAG or equivalent (FY)	Most recent PACD (mo/yr)	Planned LOP Cost ('000)	Amount Obligated to Date ('000)
Khon Kaen Univ. Research Dev. Project.	"Mid-Term Evaluation Report: Farming Systems Research Sub-Project, 13-January-8 February, 1986."	FY 83	6/89	$2,000	978

E. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

Action(s) Required	Name of officer respondible for Action	Date Action to be Completed
1. Create a new section called a "Special System Analyses Section" to be responsible for relating component research to the system framework of the overall FSR sub-project.	Dr. Nopadol, KKU Dr. Terd, KKU Ms. Thongkorn, USAID	January 1, 1987
2. Staff to be sent for upgrading courses in other Asian & Western institutions (e.g. summer session at UPLB) on rural system analysis such as human ecology, agroecosystem analysis, farming system research.	Dr. Terd, KKU Mr. Achari, DTEC Ms. Thongkorn, USAID	October 1, 1986
3. Develop a leverage technique to spread on the new methodologies generated by KKU to the action agencies (DOAE, farmer-to-farmer). Component research which promises to direct contribute to methodology development should be most strongly supported.	Dr. Terd, KKU Dr. Uthai, NEROAC Ms. Thongkorn, USAID	On going
4. Reduce the representational and administrative work load carried by senior staff by recruiting a competent administrative assistant who is fluent in both Thai and English and develop a slide-tape set on project activities (or debriefing purpose).	Dr. Terd, KKU Mr. Achari, DTEC Ms. Thongkorn, USAID	January 1, 1987
5. To create an institutional base for inter-disciplinary rural system research to improve communication between the project and the existing academic management structure of KKU.	Dr. Akin, RDI Dr. Terd, KKU Ms. Thongkorn, USAID	October 1, 1986
6. Develop a plan for sustaining rural systems research capability at KKU.	Dr. Terd, KKU Dr. Akin, RDI Ms. Thongkorn, USAID	October 1, 1986

(Attachments, if necessary)

F. DATE OF MISSION OR AID/W OFFICE REVIEW OF EVALUATION mo 2 day 6 year 1986

G. APPROVALS OF EVALUATION SUMMARY AND ACTION DECISIONS:

	Project/Program Officer	Representative of Borrower/Grantee	Evaluation Officer	Mission or AID/W Office Director
Signature	Thongkorn H. Hiranraks			
Typed Name	Mrs. Thongkorn Hiranraks	Mr. Achari Yuktananda	Dr. R. Montgomery	Dr. John R. Eriksson
Date	6/9/86	6/16/86	Roger Montgomery	John R. Eriksson

H. EVALUATION ABSTRACT (do not exceed the space provided.

The mid-term evaluation was conducted in mid-January 1986 by host country contract. Project aims are to strengthen the institutional capacity of Khon Kaen University (KKU) to conduct research appropriate to the development of Northeast rural communities of Thailand. The project is being implemented by the Research Development Institute, Khon Kaen University. Main project components are the Farming System Research, Rural Development Research, Technical assistance, Training and workshops. The evaluation was designed to look specifically at the Farming System Research Sub-Project. Other research components of the project were evaluated in January 1985. The team reviewed documents produced by the Project and held in-depth discussions with KKU staff and action agencies. The major findings are:

- The Project has made substantial progress in meeting its major objectives during its first two years of implementation.

- The Project has employed several new conceptual approaches to rural systems research. These conceptual approaches led to inter- disciplinary research which has greatly increased understanding of farmer conditions.

- Majority of the KKU staff have inadequate training in ecology and human ecology. The evaluation team recommends that additional advanced non-degree study of rural systems research should be provided.

- It was found that the University is not the appropriate institution either to develop new technologies on a large-scale nor to take responsibility for extension to the farmers. It is recommended that the Project leaders reassess the contribution that current component research activities are likely to make to development of a leverage technique which will spread the flow of new technology generation to action agencies..

- Heavy representational and administrative burdens decrease the ability of the KKU senior staff to do intensive research. It is recommended that an assistant for the Project Director should be hired. The development of a slide tape set for use in briefing visitors, and provision of editorial assistance to scientists writing Thai and English language reports are suggested.

- Appropriate recognition of the status of FSR as an interdisciplinary project which functions at a high level in the university management hierarchy above any of the individual faculties should be understood among members of the University. Location of the FSR Project Central Office in a building outside of the Faculty of Agriculture is also suggested.

- The evaluation team recommends that USAID, together with the Royal Thai Government, should explore ways to ensure that long term core funding is available to maintain a high quality rural systems research capability at KKU.

I. EVALUATION COSTS

1. Evaluation Team

Name	Affiliation	Contract Number OR TDY Person Days	Contract Cost OR TDY Cost (US$)	Source of Funds
1. Dr. A. Terry Rambo	East-West Center Honolulu, Hawaii	493-0332-001	$8,810	Project Funds
2. Dr. Manu Seetisarn	Chiang Mai Univ., Chiang Mai, Thailand	493-0332-002	$2,009	Project Funds
3. Dr. Charan Chantalakhana	Kasetsart Univ., Bangkok, Thailand	493-0332-003	$1,911	Project Funds

2. Mission/Office Professional Staff Person Days (estimate) 7

3. Borrower/Grantee Professional Staff Person-Days (estimate) 14

A.I.D. EVALUATION SUMMARY PART II

3. SUMMARY OF EVALUATION FINDINGS, CONCLUSIONS AND RECOMMENDATIONS (Try not to exceed the 3 pages provided)
Address the following items:

- o Name of mission or office
- o Purpose of activity (ies) evaluated
- o Purpose of the Evaluation and Methodology Used
- o Findings and Conclusions
- o Recommendations
- o Lessons learned

1. Name of Mission: USAID/Thailand

"Khon Kaen University Research Development Project: Mid-term Evaluation," January 13 - February 8, 1986.

2. Purpose of the Activity or Activities Evaluated:

Scientists at Khon Kaen University have been engaged for a number of years in research aimed at increasing the productivity of small rainfed farms in Northeastern Thailand. However, new technologies developed on university-managed experimental plots were not adopted by the farmers because they were not suited to actual farm conditions. It was realized that a better understanding of the human ecology of Northeastern agriculture is needed before they could successfully generate technologies.

In 1983 USAID Thailand provided a grant to Khon Kaen University to develop its institutional capability to conduct research contributing to rural development in Northeastern Thailand. A major share of this grant supports the Farming Systems Research (FSR) Project. This Project is an interdisciplinary activity involving staff from three faculties. Its major objectives are: (1) to use various rural systems analysis approaches; (2) to develop ways of linking the university-based FSR Project to action agencies; (3) to use information generated by the FSR Project to improve the academic quality; (4) to develop a long-term rural systems research capability at KKU.

SUMMARY

3. Purpose of the Evaluation and Methodology Used:

The evaluation team consisted of an ecology anthropologist, an agricultural economist and an animal scientist. The team as a whole had 18 working days to collect and analyze the information. Sources of information included reading all of the extensive documentation produced by the FSR Project and holding of in-depth discussions with KKU staff and action agencies. The evaluation was designed to look specifically at the FSR Sub-project.

4. Major Conclusions and Recommendations:

The FSR Project at Khon Kaen University has made substantial progress in meeting its major objectives during its first two years of operation. Various conceptual approaches (human ecology, agroecosystem analysis, and farming systems research) and innovative research methodologies (Rapid Rural Appraisal, Agroecosystem Analysis Workshops, Village-level Monitoring, etc.) have been employed to generate new information and understandings of rural development problems in the Northeast. The level of research activity maintained by the FSR Project is very high and the scientific quality of results is generally above that of work done before the initiation of the project.

5. Recommendation:

For the future of the FSR Project, the evaluation team put forth the following recommendations:

Date this summary prepared: June 5, 1986

J. SUMMARY OF EVALUATION FINDINGS, CONCLUSIONS AND RECOMMENDATIONS - (CONTINUED):

- CONCEPTUAL APPROACHES EMPLOYED BY THE FSR PROJECT The Project has adopted conceptual approaches to rural systems research and linked them into a single comprehensive research. However, the use of these new systems concepts is still imperfect. The evaluation team recommends that the FSR Project should establish a special Systems Analysis Section, composed of scientists from all of its existing disciplinary sections, to be responsible for relating component research to the overall systems framework of the Project.

- UNDERSTANDING OF RURAL SYSTEMS RESEARCH CONCEPTS BY FSR PROJECT SCIENTISTS. There is a limitation of training in rural systems analysis to the KKU staff. Most of the senior members of the Project hold degrees in agricultural sciences without formal training in ecology or human ecology. The evaluation team recommends that at least one senior scientist from each section should be provided the opportunity for advanced non-degree study of rural systems research at leading Asian and Western institutions.

- FOCUSING PROJECT RESEARCH ON DEVELOPING LEVERAGE METHODOLOGIES. The university is not the appropriate institution either to develop new technologies on a large-scale or to take responsibility for their extension to the farmers. Instead, the limited resources of KKU can be most effectively utilized in (1) developing new methodologies for operating technology suitable to the Northeastern rural environment, and (2) developing new methodologies for extending new technologies to the farmers. This is called "leverage methodologies" which are intended for use by action agencies. It is recommended that the Project leaders reassess the contribution that current component research activities are likely to make to development of leverage methodologies. Technology development should be given a priority to component research efforts to development of new methodologies.

- INCREASING THE RESEARCH PRODUCTIVITY OF FSR PROJECT SCIENTISTS. KKU staff lack adequate time to do intensive research because of the very heavy representational and administrative burdens. It is recommended that to reduce the burdens, a hiring of a competent administrative assistant for the Project Director, a consultant to develop a slide tape set for use in briefing visitors, and a provision of editorial assistance to scientists writing Thai and English language reports are suggested.

- CREATING AN INSTITUTIONAL BASE FOR INTERDISCIPLINARY RURAL SYSTEMS RESEARCH AT KHON KAEN UNIVERSITY. The FSR Project is perceived by many members of the university community as being dominated by the Faculty of Agriculture. The evaluation team recommends that appropriate recognition to the status of the FSP as an interdisciplinary project should be understood. Location of the FSR Project Central Office in a building outside of the Faculty of Agriculture is suggested.

- OBTAINING LONG-TERM FUNDING FOR RURAL SYSTEMS RESEARCH AT KHON KAEN UNIVERSITY. Continued provision of core funding by both the Thai government and foreign donors for many years to come is probably essential to the survival of this research capability. The evaluation team recommends that USAID and Royal Thai Government should explore ways to ensure that long-term core funding is available.

6. LESSONS LEARNED:

University Level Farming Systems Research can be very innovative but cannot be a replacement for a well functioning widespread government effort. The university cannot attempt to be the sole source of new agricultural technology nor of a large effort at extension. Instead, the proper role is that of a catalyst, using new conceptual methods to show how farmer problems can be identified, analyzed and solutions found in a quick and responsive way.

ATTACHMENTS

ATTACHMENTS (List attachments submitted with this Evaluation Summary; always attach copy of full evaluation report, even if one was submitted earlier)

Full evaluation report.

MISSION COMMENTS ON FULL REPORT

COMMENTS BY MISSION, AID/W OFFICE AND BORROWER/GRANTEE

This evaluation was conducted by a good evaluation team which put a lot of effort in achieving the evaluation objectives in a limited time frame. The result of this evaluation will be translated into Thai and will be widely used by the agencies who work on the Farming System Research, especially the part on conclusions and recommendations.

Although the Mission appreciates the concern for long-term core funding reflected in the last recommendation, approval of this report does not represent USAID commitment to funding beyond the life-of-project. The Mission would hope that the RTG itself would be able to sustain continuing farming systems research at Khon Kaen University beyond the end of this project.if found desirable.

XD-AAT-771-A

45873

MID-TERM EVALUATION REPORT

FARMING SYSTEMS RESEARCH SUB-PROJECT

KHON KAEN UNIVERSITY RESEARCH DEVELOPMENT PROJECT

USAID PROJECT NO. 493-0322

13 JANUARY - 8 FEBRUARY 1986

DR. A. TERRY RAMBO
East-West Center, Honolulu, Hawaii 96848 USA

DR. CHARAN CHANTALAKHANA
Kasetsart University, Bangkok, Thailand

DR. MANU SEETISARN
Chiang Mai University, Chiang Mai, Thailand

6

PREFACE

The Northeast is the largest region in Thailand. It is also the poorest. The explanation for that poverty is in large part environmental. Poor soils combined with erratic rainfall result in low and unstable agricultural yields. The rainfed farmers, who make up the majority of the region's population, live with the expectation of one crop failing out of every two or three.

Since the 1960's, the Royal Thai Government, with major assistance from international development donor agencies, has expended considerable resources in attempting to increase the productivity of Northeastern agriculture and to raise the levels of income and standard of living of its rural population. Despite these efforts the relative per capita GNP of the Northeast continues to lag far behind other regions. The problems of Northeastern agriculture have proven intractible to conventional development solutions. Technologies developed at great cost on experiment stations have repeatedly been rejected by the farmers who were their intended beneficiaries.

For many years, such failure was explained in terms of the farmers being too backward, traditional, or even stupid to comprehend the benefits of using new methods. More recently, assumed failure in the extension process has been the favored explanation. Only very recently did researchers begin to ask whether the new technologies they had developed were actually suitable for the conditions under which the small farmers lived and worked.

Scientists at Khon Kaen University were among the first anywhere in the world to ask this question. The Farming Systems Project which is evaluated in this report grew out of their concern with

understanding the social and environmental factors which influence farmer adoption of new technology.

In the Project's first two years, notable progress has been made in understanding the Northeastern farmers' world and the many ecological, economic and social factors which interact to influence farmer behavior within that world. Now the FSR Project is entering a much more ambitious and risky stage — the attempt to develop practical solutions to overcome the many constraints to small farm development identified in its first phase. The members of the evaluation team consider ourselves fortunate to have had the opportunity to be present at this point in the evolution of the project. It has given us a unique opportunity to participate, even if for only a short period, in what we consider to be one of the most exciting rural development research efforts in the world. We want to thank all of the members of the FSR Project for so freely and openly sharing their ideas and their concerns with us. We only hope that this report in some measure justifies the confidence they showed in us.

The evaluation team wishes to acknowledge the assistance which it received from many individuals. At Khon Kaen University we owe special thanks to Dr. Terd Charoenwatana, FSR Project Director, who did everything possible to facilitate our work. Other members of the FSR Project, notably Dr. Aran Patanothai, Dr. Viriya Limpinuntana, Dr. Kanok Phalaraksh and Dr. Sukaesinee Subhadhira, gave us much of their valuable time and unselfishly shared their ideas and views about the work of the Project in particular and rural systems research in general.

Dr. Anake Topak-ngarm provided office space for the team in the Development of Legumes for Farming Systems Project office. We thank him and his support staff, especially Mrs. Isaraporn Singho, for their assistance.

Dr. Akin Rabibhadana, Director of the Research and Development Institute, made time in an already busy schedule to interact with the team on several occasions.

Dr. Terry Grandstaff and Dr. Somluckrat Grandstaff, Consultants to the Ford III Project, helped the team in ways too numerous to fully acknowledge here.

Word processing of the draft report was ably done by Miss Sudarut Makhamjan helped by Miss Ratchanee Paoblek.

At USAID, Khun Thongkorn Hiranraks, Project Officer, unfailing did her best to solve administrative problems encountered by the team. Dr. Roger Montgomery, Program Evaluation Officer, caused us to examine many questions that we might otherwise have ignored.

KKU-FSR PROJECT MID-TERM EVALUATION REPORT

TABLE OF CONTENTS

	Page
PREFACE	i
BASIC PROJECT IDENTIFICATION DATA	viii
LIST OF ABBREVIATIONS AND ACRONYMS	ix
EXECUTIVE SUMMARY	x
MAJOR CONCLUSIONS AND RECOMMENDATIONS	xviii
INTRODUCTION	1
PART I: RURAL SYSTEMS RESEARCH BY THE FSR PROJECT	5
A. CONCEPTUAL APPROACHES TO RURAL SYSTEMS RESEARCH	5
1. Human Ecology	8
Conclusions Regarding the Use of Human Ecology Concepts	12
Recommendations Regarding Human Ecology	13
2. Agroecosystems Analysis	13
Conclusions Regarding the Use of Agroecosystems Analysis	17
Recommendations Regarding the Use of Agroecosystems Analysis as a Conceptual Framework at KKU	20
3. Farming Systems Research (FSR)	20
Conclusions Regarding the Use of Farming Systems Research	23
Recommendations Regarding the Use of FSR as a Conceptual Approach at KKU	24
Overall Conclusions Regarding Conceptual Approaches Used by the FSR Project	24
Recommendations Regarding Conceptual Approaches Used at KKU	26

Page

B. METHODOLOGY FOR RURAL SYSTEMS RESEARCH 26

1. Rapid Rural Appraisal (RRA) 27

Use of the RRA Method in Crop and Social Science Research 27

Use of the RRA Method in Animal Science 28

Conclusions Regarding Use of RRA by the FSR Project 30

Recommendations Regarding the Use of RRA 32

2. Agroecosystem Analysis Workshops 33

Conclusions Regarding the Use of Agroecosystem Analysis Workshops 33

3. Village-Level Monitoring 34

Conclusions Regarding Village Monitoring Studies 35

Recommendations Regarding Monitoring Studies 35

4. Farmer-to-Farmer Extension Methodology 35

Conclusions Regarding Use of Farmer-to-Farmer Extension Method 37

Recommendations Regarding the Use of Farmer-to-Farmer Extension Methodologies 37

Overall Conclusions Regarding FSR Project Methodology 38

Overall Recommendations Regarding Use of Methodologies by the FSR Project 40

C. INSTITUTIONAL ASPECTS INFLUENCING RURAL SYSTEMS RESEARCH BY THE FSR PROJECT 40

Conclusions Regarding Institutional Aspects 44

Recommendations Regarding Institutional Aspects 45

PART II: FSR PROJECT LINKAGES WITH ACTION AGENCIES 48

D. CONCEPTUAL APPROACH TO FSR PROJECT LINKAGES WITH ACTION AGENCIES 48

Page

Conclusions regarding the Conceptual Approach Employed by the FSR Project for its Linkages with Action Agencies 52

Recommendations Regarding Conceptual Approaches to Project Linkages with Action Agencies 53

E. METHODOLOGIES EMPLOYED IN FSR PROJECT LINKAGES TO ACTION AGENCIES 54

Conclusions Regarding Methodologies 56

Recommendations Regarding Methodologies for Project Linkages with Action Agencies 57

F. INSTITUTIONAL ASPECTS OF FSR PROJECT LINKAGES WITH ACTION AGENCIES 57

Conclusion Regarding Institutional Aspects of Project Linkages with Action Agencies 59

Recommendations Regarding Institutional Aspects of Project Linkages to Action Agencies 60

PART III: INFLUENCE OF THE FSR PROJECT ON KKU GRADUATE QUALITY 61

G. THE TEACHING OF RURAL SYSTEMS CONCEPTS AT KKU 61

Conclusions Regarding Teaching of Systems Concepts at KKU 62

H. METHODS FOR TEACHING RURAL SYSTEMS CONCEPTS AT KKU 63

Conclusions Regarding Methods for Teaching Rural Systems Concepts 64

Recommendations Regarding Methods for Teaching Rural Systems Concepts 64

I. INSTITUTIONAL ASPECTS AFFECTING GRADUATE QUALITY 64

Recommendations 65

PART IV: DEVELOPING A SUSTAINABLE RURAL SYSTEMS RESEARCH CAPABILITY AT KHON KAEN UNIVERSITY 66

J. SYSTEMS CONCEPTS IN RELATION TO LONG-TERM DEVELOPMENT OF KKU RURAL RESEARCH CAPABILITY 66

Page

Conclusions Regarding Systems Concepts in Relation to KKU Rural Research Capability 69

Recommendations Regarding Systems Concepts in Relation to KKU Rural Research Capability 69

K. METHODOLOGIES FOR DEVELOPING AND SUSTAINING KHON KAEN UNIVERSITY INSTITUTIONAL CAPABILITY FOR DOING RURAL SYSTEMS RESEARCH 70

1. Increasing Staff Systems Research Capabilities 70

2. Enhancing the External Reputation of KKU as a Center of Excellence for Systems Research 75

Conclusions Regarding Methods for Developing and Sustaining KKU Institutional Capabilities for Doing Rural Systems Research 76

Recommendations Regarding Methods for Developing and Sustaining KKU Institutional Capabilities for Doing Rural Systems Research 76

L. INSTITUTIONAL ASPECTS OF DEVELOPING KKU RURAL SYSTEMS RESEARCH CAPABILITY 77

1. Definition of the University's Role 77

2. Organization of Rural Systems Research within KKU 79

3. Professional Rewards to KKU Staff for Engaging in Rural Systems Research 80

4. Prospects for Long-Term Funding 83

Conclusions Regarding Institutional Aspects 84

Recommendations 86

APPENDIX A. SCOPE OF WORK 90

APPENDIX B. SOURCES OF INFORMATION 96

BASIC PROJECT IDENTIFICATION DATA

1. Country: Thailand

2. Project Title: Khon Kaen University Research Development Project

3. Project Number: Grant 493-0332

4. Project Dates:

   a. First Project Agreement: 6/30/83
   b. Final Obligation: FY 1983
   c. Project Assistance Completion Date (PACD): 6/30/89

5. Project Funding:

   a. A.I.D. Bilateral Funding (Grant and/or Loan): Grant $2.0 million U.S.

   b. Other Major Donors: -

   c. Host Country Counterpart Funds: $1.447 million U.S.

   Total $3.447 million U.S.

6. Mode of Implementation: Host country contract. Names' Dr. Terry Rambo, team leader, Dr. Manu Seetisarn and Dr. Charan Chantalakhana, team members.

7. Project Design: USAID/Thailand

8. Responsible Mission Officials: (For the full life of the project).

   a. Mission Director(s): Mr. Robert Halligan and Dr. John R. Eriksson

   b. Project Officer(s): Ms. Thongkorn Hiranraks

9. Previous Evaluation(s): 2/1985

10. Cost of Present Evaluation:

	Person Days	Dollar Costs
a. Direct Hire:		
(1) AID/W TDY:	-	-
(2) USAID staff:	5	-
b. Contract	60	12,658
c. Other	-	-

LIST OF ABBREVIATIONS AND ACRONYMS

DOA:	Department of Agriculture
DOAE:	Department of Agricultural Extension
EAPI:	Environment and Policy Institute, East-West Center
FSR:	Farming Systems Research
FSRI:	Farming Systems Research Institute
FSR Project:	Khon Kaen University Farming Systems Research Project
KKU:	Khon Kaen University
KT:	Kaset Tambon (tambon agricultural extension agent)
MOAC:	Ministry of Agriculture and Cooperatives
RRA:	Rapid Rural Appraisal
SMS:	Subject Matter Specialist
SUAN:	Southeast Asian Universities Agroecosystem Network

EXECUTIVE SUMMARY

Beginning in the mid-1970's, scientists at Khon Kaen University have been engaged in research aimed at increased the productivity of small rainfed farms in Northeastern Thailand, the largest and poorest region in the Kingdom. As they gained experience they became increasingly dissatisfied with results achieved by conventional approaches to agricultural research and development. New technologies developed on university-managed experimental plots were not adopted by the farmers. The KKU scientists came to recognize that their new technologies were rejected by the farmers because they were not suited to actual farm conditions. They realized that they needed to better understand the human ecology of Northeastern agriculture before they could successfully generate technologies fitting farmer needs.

In 1983 USAID Thailand provided a grant to Khon Kaen University to develop its institutional capability to conduct research contributing to rural development in Northeastern Thailand. A major share of this grant supports the Farming Systems Research (FSR) Project. This Project is an interdisciplinary activity involving staff from three faculties. Its major objectives are:

1) to use various rural systems analysis approaches (e.g., human ecology, agroecosystems analysis, farming systems research) to develop better understandings of resource problems and opportunities of farming in rainfed (non-irrigated) areas of Northeast Thailand.

2) to develop ways of linking the university-based FSR Project to action agencies bearing formal responsibility for rural development programs in the Northeast.

3) to use information generated by the FSR Project to improve the academic quality of students graduating from Khon Kaen University

4) to develop a sustainable long-term rural systems research capability at KKU.

Cross-cutting Project concern with achieving these four objectives is a concern with the development of conceptual approaches, methodologies, and the organizational and structural means to use to achieve its multiple objectives.

The evaluation team was composed of an ecological anthropologist (Dr. A. Terry Rambo, Research Associate at the East-West Environment and Policy Institute) who served as Team Leader, an agricultural economist (Dr. Manu Seetisarn, Professor of Agricultural Economics, Chiang Mai University) and an animal scientist (Dr. Charan Chantilakhana, Head, Department of Animal Science, Kasetsart University). All had considerable prior knowledge of the history of attempts to develop rural systems research at KKU.

The team as a whole had 18 working days to collect and analyze the information on which this report is based. Sources of information included reading virtually all of the extensive documentation produced by the FSR Project and holding of in-depth discussions with KKU staff (both inside and outside of the Project) and staff of action agencies with which the Project is collaborating.

MAJOR CONCLUSIONS AND RECOMMENDATIONS

The FSR Project at Khon Kaen University has made substantial progress in meeting its major objectives during its first two years of operation. Various conceptual approaches (human ecology,

agroecosystem analysis, and farming systems research) and innovative research methodologies (Rapid Rural Appraisal, Agroecosystem Analysis Workshops, Village-level Monitoring, etc.) have been employed to generate new information and understandings of rural development problems in the Northeast. The level of research activity maintained by the FSR Project is very high and the scientific quality of results generally above that of work done before the initiation of the project.

The major concerns of the evaluation team relate to the future of the FSR Project. There are a number of important conceptual, organizational, and institutional issues that should be addressed if progress in future years is to match that in the first stage of the activity. Issues of greatest concern are:

1. CONCEPTUAL APPROACHES EMPLOYED BY THE FSR PROJECT

The Project has displayed considerable scientific ambition in its adoption of diverse conceptual approaches to rural systems research and its linking of these into a single comprehensive intellectual framework. The resulting interdisciplinary research has greatly increased understanding of the conditions under which Northeastern farmers must operate, especially the interplay between social and ecological factors in farmer acceptance of new component technology. This represents a major advance from the situation at KKU before initiation of the project.

Use of these new systems concepts by the FSR Project is still imperfect. Incomplete integration of disciplinary substudies into the systems framework is a continuing weakness, reflecting the lack of a

section within the Project charged with formal responsibility for systems analysis.

The evaluation team recommends that the FSR Project should establish a special Systems Analysis Section, composed of scientists from all of its existing disciplinary sections, to be responsible for relating component research to the overall systems framework of the Project.

2. UNDERSTANDING OF RURAL SYSTEMS RESEARCH CONCEPTS BY FSR PROJECT SCIENTISTS

Present shortcomings in the application of systems concepts in FSR Project research in large part reflect the very limited training that staff have had in rural systems analysis. Most of the senior members of the Project hold degrees in agricultural sciences. No staff have had formal training in ecology or human ecology. Extended and intensive study of basic concepts and methods of rural systems analysis is needed to reinforce staff capabilities to do such research.

The evaluation team recommends that at least one senior scientist from each section should be provided the opportunity for advanced non-degree study of rural systems research at leading Asian and Western institutions.

3. FOCUSING PROJECT RESEARCH ON DEVELOPING LEVERAGE METHODOLOGIES

The FSR Project has begun to shift its primary emphasis from trying to develop new technologies for use by the farmers to development of new methodologies for doing applied research and extension. These "leverage methodologies," as the evaluation team has

called them, are intended for use by action agencies bearing formal responsibility for rural development in the Northeast.

The testing of simplified methods of agroecosystem analysis for use by tambon-level extension agents in the Project's joint work with the Department of Agricultural Extension to introduce the raising of peanuts after rice in Khon Kaen Province represents a successful example of leverage methodology development.

Increasing the emphasis given by the Project to development of new methodologies reflects recognition of the fact that the university is not the appropriate institution either to develop new technologies on a large-scale or to take responsibility for their extension to the farmers. Instead, the limited resources of KKU can be most effectively utilized in (1) developing new methodologies for generating technology suitable to the Northeastern rural environment and (2) developing new methodologies for extending new technologies to the farmers. After developing and testing these new methodologies, KKU introduces them to the action agencies which bear formal responsibility for rural development. Continuing large scale development of technology and its extension to the farmers is the primary task of these agencies. By focusing the FSR Project on developing methodologies of this sort, rather than on direct development and extension of new technology to the farmers, the FSR Project is able to have an impact greatly disproportionate to its own size and strength, hence the term "leverage methodologies."

It is recommended that the Project leaders reassess the contribution that current component research activities are likely to make to make to development of leverage methodologies. Technology

development should not be halted but priority should be given to component research efforts judged most likely to also contribute to development of new methodologies.

4. INCREASING THE RESEARCH PRODUCTIVITY OF FSR PROJECT SCIENTISTS

Shortage of human resources is a key limiting factor on further research progress at KKU. Senior staff, in particular, lack adequate time to do intensive research because of the very heavy representational and administrative burdens that they carry. So much of their time is taken up with briefings for visitors, handling of routine administrative tasks, and editing of reports prepared by junior staff, that virtually no time is left for thinking, doing analysis of data, or writing. Use of these highly trained scientists to do routine administrative tasks represents a major waste of scarce resources at KKU.

It is recommended that steps be taken to reduce the representational and administrative workload of senior Project scientists. Hiring of a competent administrative assistant for the Project Director, obtaining the services of a consultant to develop a slide tape set for use in briefing visitors, and provision of editorial assistance to scientists writing Thai and English language reports are suggested.

5. CREATING AN INSTITUTIONAL BASE FOR INTERDISCIPLINARY RURAL SYSTEMS RESEARCH AT KHON KAEN UNIVERSITY

The present relationship between the FSR Project and the several faculties which have staff taking part in its activities is somewhat

ambiguous and easily subject to misinterpretation. Although it is by far the largest and most active interdisciplinary effort at KKU, the FSR Project is perceived by many members of the university community as being dominated by the Faculty of Agriculture. This tends to inhibit participation by staff from other faculties. There is a real contradiction between the stated Project objective of developing interdisciplinary research capability for KKU as a whole and the current structural position of the FSR Project in the University.

The evaluation team recommends that appropriate recognition be given by Khon Kaen University to the status of the Farming Systems Project as an interdisciplinary project which functions at a level in the university management hierarchy above any of the individual faculties. Location of the FSR Project Central Office in a building outside of the Faculty of Agriculture is suggested.

6. OBTAINING LONG-TERM FUNDING FOR RURAL SYSTEMS RESEARCH AT KHON KAEN UNIVERSITY

A sustainable rural systems research capability at KKU can not be developed either quickly or cheaply. The initial high research rate of return on the USAID grant reflects the existence at KKU of capability already developed as a result of ten years of investment of both money and scientific expertise by the Ford Foundation and other donor agencies. The present USAID grant has contributed to further developing institutional capability but development and maintenance of this rural systems research capability in the future is unlikely to be self-sustaining or automatic. Continued provision of core funding by both the Thai government and foreign donors for many years to come is probably essential to the survival of this research capability.

The evaluation team recommends that USAID, together with the Royal Thai Government, should explore ways to ensure that long-term core funding is available to maintain a high quality rural systems research capability at Khon Kaen University.

MAJOR CONCLUSIONS AND RECOMMENDATIONS

The FSR Project at Khon Kaen University has made substantial progress in meetings its major objectives during its first two years of operation. Various conceptual approaches and innovative research methodologies have been employed to generate new information and understandings of rural development problems in the Northeast. The level of research activity maintained by the FSR Project is very high and the scientific quality of results generally above that of work done before the initiation of the Project.

The overall assessment by the evaluation team of Project accomplishments to date is, therefore, a very positive one. Not everything has been done to perfection, and a number of recommendations for modifications are made in this report, but our major conclusion is that the FSR Project has been generally very successful so far in achieving its objectives.

The major concerns of the evaluation team relate to the future of the FSR Project. There are a number of important conceptual, organizational, and institutional issues that should be addressed if progress in the future is to match that in the first stage of the activity. Our major conclusions and recommendations are directed at these central concerns relating to the long-term development and viability of rural systems research at KKU.

1. CONCEPTUAL APPROACHES EMPLOYED BY THE FSR PROJECT

The Project has displayed considerable scientific ambition in its adoption of several diverse conceptual approaches to rural systems

research (human ecology, agroecosystem analysis, and farming systems research) and its linking of these into a single comprehensive intellectual framework. It is because the Project employs this broad, theoretically-grounded framework that scientists from many other disciplines, particularly the social sciences, have been willing to invest so much effort in applied agricultural development research. The resulting interdisciplinary research has greatly increased understanding of the conditions under which Northeastern farmers must operate. In particular, there is much increased awareness of the interplay between social and ecological factors in farmer acceptance of new component technology. This represents a major advance from the situation at KKU before initiation of the project.

A major problem with the present use of the several different conceptual approaches employed by KKU is the absence of feedback loops between research employing the different approaches. Each of the approaches is treated as if it were independent of the others. It is difficult to find examples of new findings generated by research employing one conceptual approach, e.g., human ecology, directly influencing design of work employing another approach, e.g., farming systems. The use of agroecosystems analysis to support FSR on peanuts after rice is one outstanding exception.

The failure of new empirical research findings to influence the basic conceptual approaches is also a source of concern. All of the conceptual approaches used at KKU are new, all are highly imperfect, and all need to be tested and modified in the light of new empirical understandings of the rural Northeast.

Recommendations:

The evaluation team is not suggesting that KKU should concentrate on theoretical research. Given the interests and capability of KKU staff, and the institutional constraints under which they must work, attempting to specialize in theoretical development could only result in failure and frustration. It is recommended, however, that greater attention should be paid by Project scientists to understanding and refining the conceptual approaches they have adopted. The goal should be to develop an interactive relationship between understanding of systems concepts and applied research, not to emphasize one at the expense of the other. Addition of a special Systems Analysis Section to the three disciplinary sections should be considered. This section would be responsible for relating component research to the systems framework of the overall FSR Project.

2. UNDERSTANDING OF RURAL SYSTEMS RESEARCH CONCEPTS BY FSR PROJECT SCIENTISTS

Present shortcomings in the application of systems concepts in FSR Project research (see Section 1 above) in large part reflect the very limited training that staff have had in rural systems analysis. Most of the senior members of the Project hold degrees in agricultural sciences. No staff have had formal training in ecology or human ecology. Their present understanding of systems research concepts is derived almost entirely from participation in short agroecosystem analysis and human ecology training workshops.

Rural systems analysis, however, is neither simple nor easily learned. The cookbook approach is inapplicable in systems research.

Instead, Project staff need to have opportunities for extended and intensive study of basic concepts and methods of rural systems analysis at other Asian and Western institutions with strong programs in this field. This might, in some few cases, involve graduate degree work but, particularly in the case of senior scientists, provision of opportunities for non-degree advanced studies is more important. No provision presently exists for longer term post-graduate professional study e.g., fellowships to allow senior staff to spend six months to one year working at leading foreign institutions focusing on systems research.

Recommendations:

Senior Project scientists should be given opportunities for advanced study of rural systems analysis concepts at leading Asian and Western institutions. At least one scientist from each of the three sections should have the chance to spend from three months to one year as a non-degree research fellow at an appropriate foreign institution. The evaluation team also recognizes a continuing need to provide introductory training in systems research to junior staff. Finding ways to provide such training in human ecology and agroecosystems analysis to new participants in the Project, particularly social scientists who only became involved after the initial series of training workshops was already finished, is important to maintaining a shared sense of research objectives and conceptual approaches. Short courses offered by other member institutions of SUAN may offer one useful training opportunity for junior staff.

3. FOCUSING FSR PROJECT RESEARCH ON THE DEVELOPMENT OF LEVERAGE METHODOLOGIES

Beginning with the KKU-Ford Cropping Systems Project in 1975, KKU has searched for effective ways to bring the scientific expertise of the university to bear on solving practical problems of rural development. Many concepts have been tried and found wanting in the course of evolving the present strategy of concentrating FSR Project efforts on development of what the evaluation team has labeled "leverage methodologies." These are new methods that can be used by action agencies to develop and extend new technologies to the farmers. The testing of simplified methods of agroecosystem analysis for use by kaset tambons, and farmer-to-farmer extension methodologies in the Project's joint work with the Department of Agricultural Extension to introduce the raising of peanuts after rice in Khon Kaen Province is a successful example of development of leverage methodologies.

The focusing of Project efforts on development of new methodologies derives from recognition of the fact that the university is not the appropriate institution either to develop new technologies on a large-scale or to take responsibility for their extension to the farmers. Instead, the limited resources of KKU can be most effectively utilized in (1) developing new methodologies for generating technology suitable to the Northeastern rural environment and (2) developing new methodologies for extending new technologies to the farmers. After developing and testing these new methodologies, KKU introduces them to the action agencies (e.g., the Department of Agricultural Extension) which bear formal responsibility for rural development. Continuing large scale development of technology and its

extension to the farmers is the task of these agencies. KKU's primary role is to continue generating new methodologies which can then be adopted for use by the action agencies. By focusing the FSR Project on developing methodologies of this sort, rather than on direct development and extension of technology to the farmers, the FSR Project is able to have an impact greatly disproportionate to its own size and strength, hence the term "leverage methodologies."

Recommendations:

The evaluation team strongly supports the concept of the FSR Project making the development of leverage methodologies its central concern. This new concept is one of the most important products to have come out of the first two years of work by the Project. Because it is a new, and still evolving concept, its full implications have not yet been worked out in detail. We recommend that the Project leaders give this question their immediate attention since it has major consequences for which component research should receive priority in future years. Component research which promises to directly contribute to methodology development should be most strongly supported. We have reservations about the extent to which many of the component research activities currently carried out by the project will actually contribute to methodology development. There is a need to reevaluate these activities to ensure that they are compatible with the new Project emphasis on development of leverage methodologies as a major objective.

4. INCREASING THE RESEARCH PRODUCTIVITY OF FSR PROJECT SCIENTISTS

A key limiting factor on further research progress at KKU is the shortage of human resources. Senior staff, in particular, lack adequate time to do intensive research because of the very heavy representational and administrative burdens that they carry. So much of their time is taken up with meetings and handling of administrative details, that virtually no time is left for thinking, doing analysis of data, or writing. During just the three weeks that the evaluation team was in residence, the project director had to meet 16 Thai and foreign visitors in six separate groups. Particularly burdensome is the need to present frequent background briefings on the FSR Project to visitors with no prior knowledge of either the project or the Northeast of Thailand. Each such briefing requires the presence of several senior staff for at least two hours.

Administrative work, including handling many routine duties that would be delegated to clerical staff in Western institutions, also consumes a large share of the time and energy of the Project leadership.

The unavailability of qualified editorial assistance has forced senior researchers to assume responsibility for editing project publications, especially those in English. In addition to taking much time and energy, this has created a real bottleneck for disseminating project findings. Numerous draft reports are still unpublished because of the lack of time to edit them.

Recommendations:

Reducing the representational and administrative work load carried by senior staff is imperative if they are to be able to give more of their attention to actual research. The evaluation team recommends that priority be given to recruitment of a competent administrative assistant, ideally an individual fluent in both Thai and English, to take over much of the routine administrative work currently done by the Project Director and the Section leaders. Because the position is a temporary one funded by soft money, it will be necessary to offer a salary considerably above the civil service scale to attract someone with the necessary qualifications. Given the current wastage of scarce scientific resources on doing routine administrative work, such expenditure is fully justified in our view.

The Project would also benefit from having the services of a qualified consultant to develop a set of slide-tape presentations on its activities. These slide-tape presentations could be used for introductory briefings to visitors, thus reducing representational demands on senior staff.

Making editorial assistance, particularly for English language papers, readily available to project scientists could increase the speed with which project findings are prepared for publication and also reduce demands on senior staff to provide routine editorial services.

5. CREATING AN INSTITUTIONAL BASE FOR INTERDISCIPLINARY RURAL SYSTEMS RESEARCH AT KHON KAEN UNIVERSITY

The present relationship between the FSR Project and the several faculties which have staff taking part in its activities is somewhat

ambiguous and easily subject to misinterpretation. Although it is by far the largest and most active interdisciplinary effort at KKU, involving staff from at least three different faculties, the FSR Project is perceived by many members of the university community as being dominated by the Faculty of Agriculture. The Project leaders, many of whom are in fact members of the Faculty of Agriculture, have gone to considerable lengths to take interests of staff from other faculties, particularly the social sciences, into account, but this does not fully solve the structural problem. There is a real contradiction between the stated Project objective of developing interdisciplinary research capability for KKU as a whole and its current institutional status.

Recommendations:

The evaluation team suggests that careful consideration should be given to the creation of an appropriate institutional structure for interdisciplinary rural systems research at KKU. The fact that the FSR Project is a genuine interdisciplinary effort and not a wholly owned subsidary of the Faculty of Agriculture needs to be given institutional recognition. The desirability of designating the Project as a university-wide activity set above any individual faculty in the KKU management hierarchy should be explored.

Locating the Central Office of the Project and a staff common room in a building outside of the Faculty of Agriculture should also be considered.

We are not suggesting, however, that there is a need for any radical change in the existing management structure of the Project.

The present arrangement of having an interdisciplinary core group coordinate research by disciplinary sections under the general supervision of the Project advisory committee appears to be quite effective. Inclusion of some key departmental heads in the advisory committee should be considered, however, in order to improve communications between the Project and the existing academic management structure of KKU.

6. OBTAINING LONG-TERM FUNDING FOR RURAL SYSTEMS RESEARCH AT KHON KAEN UNIVERSITY

A sustainable rural systems research capability at KKU can not be developed either quickly or cheaply. The high research rate of return on the USAID FSR grant reflects the existence at KKU of capability already developed as a result of ten years of investment of both money and scientific expertise by the Ford Foundation and other donor agencies. The present USAID grant has contributed to further developing institutional capability but development and maintenance of this rural systems research capability in the future is unlikely to be self-sustaining or automatic. Continued provision of core funding by both the Thai government and external donors for many years to come is probably essential to its survival.

Rural systems research at KKU has been almost entirely financed from extra-university sources, primarily by grants given by foreign donor agencies. The Ford Foundation, IDRC, USAID, and CIDA, among others, have provided several million dollars to support development of research capability. Shortage of money is not, at present, a major constraint on research at KKU. In fact, having too much money chasing too few qualified scientists is a cause for some concern at present.

Long-term prospects are more uncertain. It does not appear likely that the Thai government will be able to provide funding for rural systems research at KKU at anywhere near the level currently obtained from foreign donors. Given the involvement of a variety of foreign donor agencies in rural development in the Northeast, we do not expect that KKU will face impossible problems in attracting some external research funding in the future. The nature of this funding is likely to be more of a problem, however. Donor agencies have their own priorities which all too often reflect current fads rather than the results of systematic analysis of rural development problems. What is needed, however, is support for the kinds of research that scientists at KKU have themselves identified as significant. Unless substantial untied funding to support basic rural systems research is available the prospect of KKU becoming a sort of Northeastern Thai "beltway bandit" contract research operation is not wholly unthinkable.

Obtaining long-term core funding to support continued development of rural systems research capability at KKU is seen as extremely important by the evaluation team. A number of international donor agencies, including USAID, are to be commended for having had the foresight and courage to invest major grant funds in attempting to develop a new kind of rural systems research capability at KKU. No readymade models for developing such a capability existed elsewhere and the risk of failure was high. The performance to date of the FSR Project has more than justified initial expectations.

The present USAID grant has achieved the results it has largely because it did not try to dictate research directions in advance.

Instead, within the general framework of farming systems research, it provided Project scientists with a great deal of freedom to choose what they considered to be the most rewarding directions to follow in their research. The gradual emergence of Project concern with generation of "leverage methodologies" is an example of a very promising new research direction that was not envisaged in the original project design.

Recommendations:

The evaluation team recommends that USAID should work togeth- with the Thai government (and other foreign donor agencies) to ensure that substantial untied core funds, of the sort represented by the existing grant to the Farming Systems Research Project, continue to be available to support development of rural systems research capability at KKU over at least a ten year period. We fully agree with the recent statement by the New Zealand geographer, John McKinnon, that

> it is in Khon Kaen that "good" rather than "competitive science" is being fostered for rural development. In the long run what will be achieved is more likely to earn international acclaim than much of what is being attempted in Bangkok, (Pacific Viewpoint, vol. 26, 1985, p. 583).

The key words are "in the long run." The FSR Project has made considerable progress in a short time but a much longer period will be required to consolidate these early initiatives into an enduring KKU institutional capability to do high quality systems research in support of rural development in Northeastern Thailand.

INTRODUCTION

This report presents the findings, conclusions, and recommendations of the mid-term evaluation team for the Farming Systems Research (FSR) Sub-project of the USAID supported Khon Kaen University Research Development Project. The report presents both an assessment of the work of the project to date and a discussion of possible directions in which the project may go in the future. The emphasis is not on criticizing past performance (although we have not hesitated to do so where we feel criticism is justified and can lead to useful changes) but on making suggestions for future improvements.

The primary purpose of the mid-term evaluation is to examine in detail the approach the FSR Project is taking toward meeting the overall USAID Research Development Project grant objective of strengthening the institutional capacity of Khon Kaen University to conduct research that will contribute to rural development in Northeastern Thailand (See Appendix A: Scope of Work). Because the Project Paper does not clearly set out the specific objectives to be accomplished by the FSR sub-project, the evaluation team has relied on intensive discussions with senior staff to identify what they consider to be the main objectives of the FSR Project. Four objectives were identified:

1) to use various rural systems analysis approaches (e.g., human ecology, agroecosystems analysis, farming systems research) to develop better understandings of resource problems and opportunities of farming in rainfed (non-irrigated) areas of Northeast Thailand. For the sake of brevity we refer to this in subsequent discussions as "rural systems research."

2) to develop ways of linking the university-based FSR Project to action agencies bearing formal responsibility for rural development programs in the Northeast. We refer to this as "linkages with action agencies."

3) to use information generated by the FSR Project to improve the academic quality of students graduating from Khon Kaen University. We refer to this as "graduate quality."

4) to develop a sustainable long-term rural systems research capability at KKU. We refer to this as "KKU research capability."

Cross-cutting the concern of Project leaders with their success in achieving these four objectives is a concern with the conceptual approaches ("concepts"), methodologies ("methods"), and the organizational and structural means ("institutional aspects") employed by the FSR Project in attempting to achieve its multiple objectives.

The evaluation team decided that the most efficient way to carry out its work was to organize these two types of information (objectives and means of achieving them) into a matrix format (Figure 1). This report is also organized in terms of this matrix. It is divided into four major sections which evaluate the Project's performance in relation to achieving each of its four objectives. Each of these sections is further divided into sub-sections discussing concepts, methods, and institutional aspects.

The team as a whole had 18 working days to collect and analyze the information on which this report is based. Sources of information included reading virtually all of the extensive documentation produced by the FSR Project and holding of in-depth discussions with KKU staff (both inside and outside of the Project) as well as staff of action

Means Employed By FSR Project	FSR Project Objectives: Rural Systems Research	Linkages With Action Agencies	Graduate Quality	KKU Research Capability
Concepts	What systems analyis concepts are being employed? What new understandings have they produced?	What concepts guide the establishment of project linkages with action agencies?	What systems concepts are taught to students?	To what extent do KKU staff understand and employ systems research approaches?
Methods	What research methods are used? What are the strengths and limitations of these methods?	What methods are used for linkages?	How are project results transmitted to students?	What can the university do to encourage development of systems research capability?
Institutional Aspects	How does project organization influence the use of systems concepts in rural research?	What capabilities does the project have for establishing linkages?	What institutional factors affect employing project results to improve graduate quality?	What are the institutional factors that influence long-term sustainability of rural systems research?

Figure 1: Matrix for Analysis of the Performance of the FSR Project

agencies with which the Project is attempting to collaborate (see Appendix B for a list of sources of information employed by the team). Because the team was assigned an office in the Agronomy Building only a few meters away from the FSR Project Office we had repeated opportunities for informal discussions with Project scientists. These informal sessions were invaluable in clarifying our understanding of the Project.

Although the team leader was assigned formal responsibility for writing the report, the actual product is very much a collective product, as the reader will quickly become aware from encountering the somewhat different styles of writing in different sections. Regardless of the actual authorship of individual sections, all findings, conclusions, and recommendations presented in this report were reviewed and accepted by all team members.

PART I. RURAL SYSTEMS RESEARCH BY THE FSR PROJECT

A. CONCEPTUAL APPROACHES TO RURAL SYSTEMS RESEARCH

Rural systems research at KKU employs three distinct conceptual approaches: human ecology, agroecosystem analysis, and farming systems research. Project staff see these three approaches as being related in a hierarchical manner. Human ecology provides an overall perspective; agroecosystem analysis provides a procedure for analyzing specific local situations; and farming systems research is a method for solving specific problems. Figure A-1 illustrates the model used by Project leaders to describe the relationship between these three conceptual approaches.

Based upon discussions with Project staff and reading of Project documents, the evaluation team would suggest that the relationship between these three conceptual approaches is more complex than it appears in Figure A-1. Rather than simply representing a progression from more theoretical to more applied, the three approaches occupy different places on several different dimensions. They vary not only according to the extent to which they are theoretical or applied, but also as to whether they are holistic or sectoral, involve social scientists or agriculturalists, and are qualitative or quantitative. Human ecology is theoretically oriented, holistic, qualitative, and heavily reliant on social scientists. Farming systems research is applied, sectoral, quantitative, and largely conducted by agriculturalists. Agroecosystem analysis lies somewhere in the middle on all dimensions (Figure A-2).

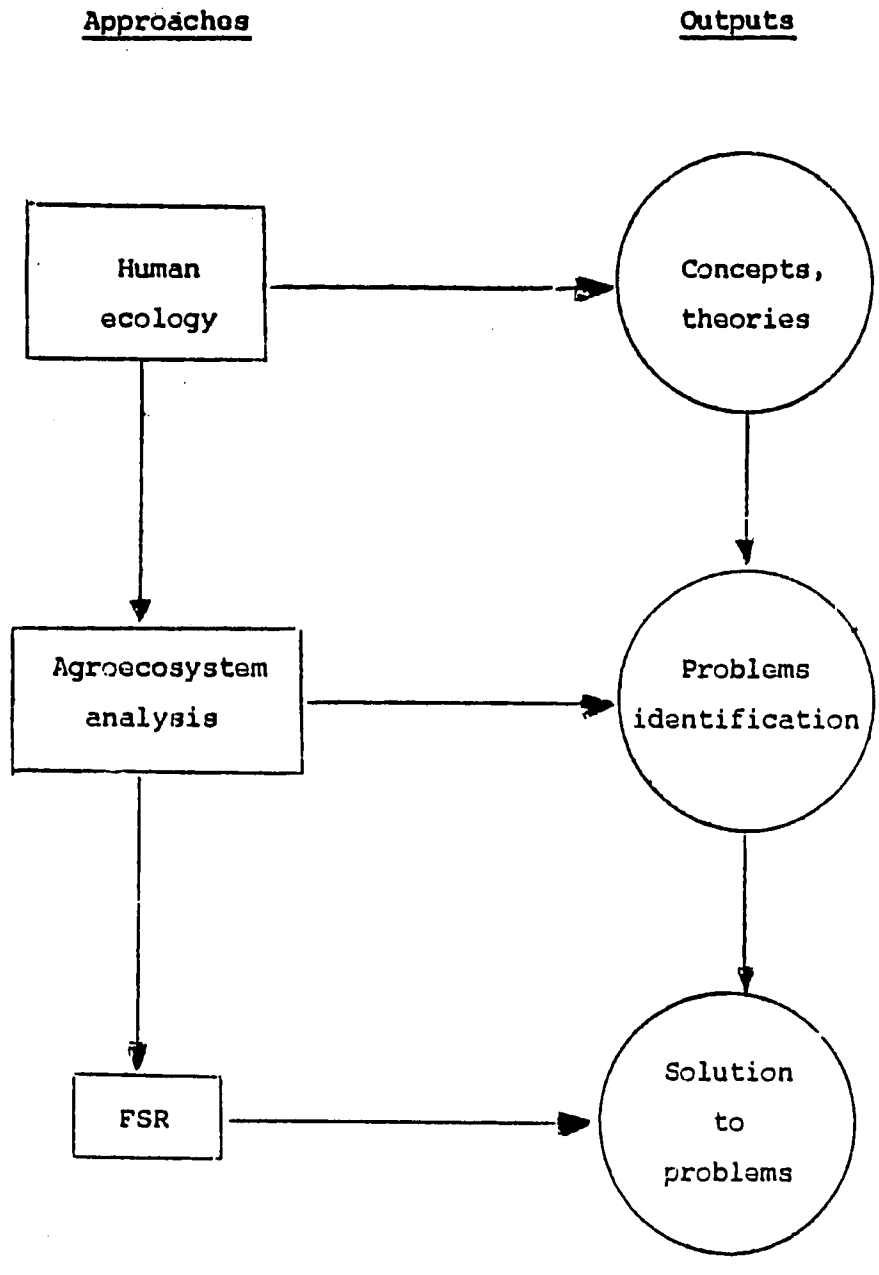

Figure A-1: Relationship of human ecology, agroecosystem analysis, and farming systems research.

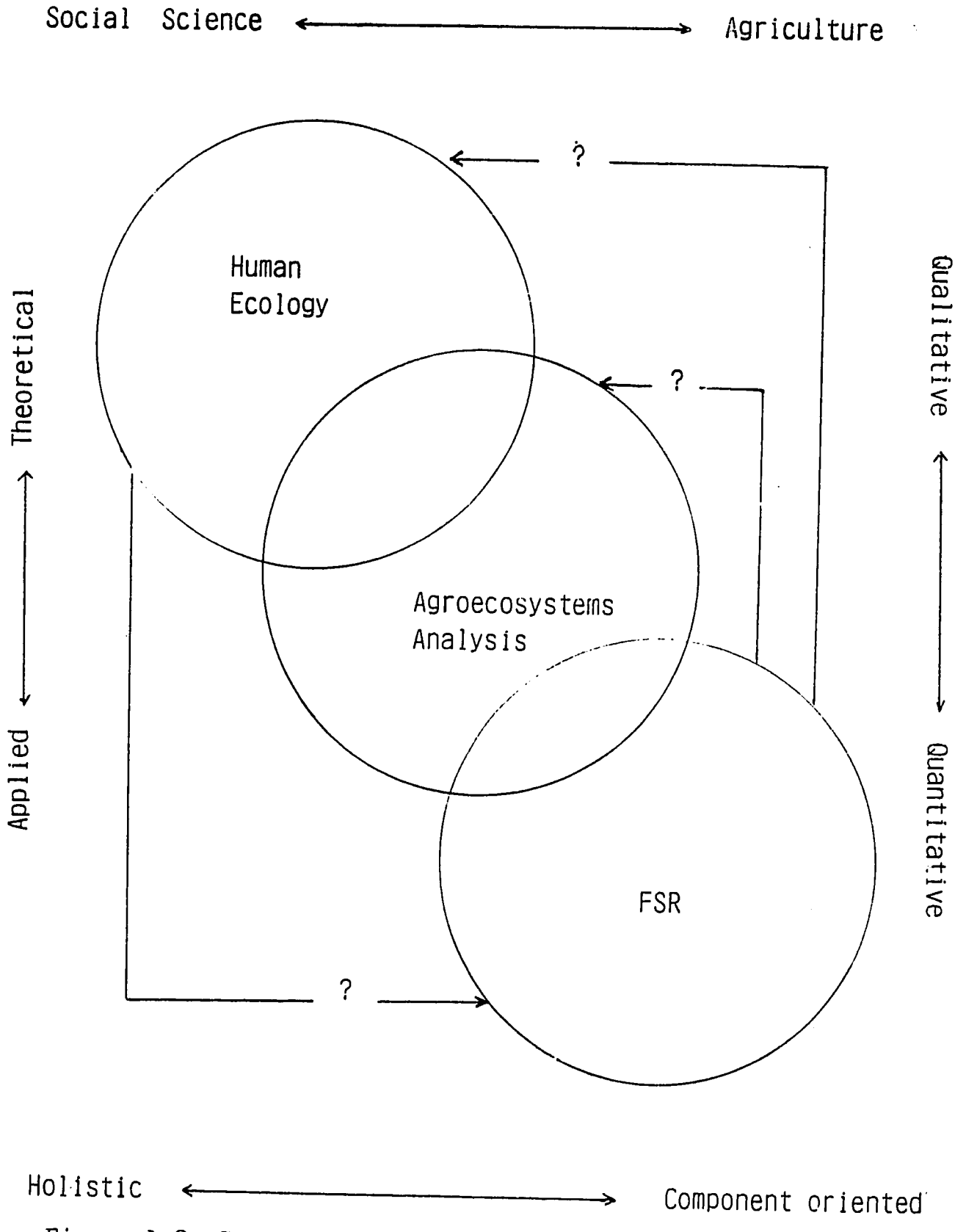

Figure A-2: Conceptual Approaches to Rural Systems Research Employed by the KKU FSR Project

1. Human Ecology

Human ecology is the study of the relationship of people with their environment. The specific approach employed at KKU is the "systems model of human ecology" which focuses attention on the flow of energy, materials, and information between the human social system and the ecosystem (Figure A-3). Initially derived from the East-West Environment and Policy Institute, the human ecology approach at KKU has been modified by incorporation of Terry Grandstaff's emphasis on "resource systems," the analysis of where in the ecosystem resources used by people originate and how they are obtained by people (Figure A-4). This increased attention to resources is valuable in helping to focus human ecology research on topics of direct interest to agricultural researchers.

A recent Ford II report, "trees in paddyfields," (written by several researchers associated with the FSR Project), offers an excellent example of resource system oriented human ecology research at KKU. This study started with the observation that, in contrast to the Central Plain, there are many trees in paddyfields in the Northeast. The question asked was, why do the farmers have these trees there when, from a conventional agronomic perspective, there would appear to be advantages to clearing them?

The researchers found that the trees provided many resources and services needed by the farmers: food, fuel, construction material, livestock fodder, shade for people and livestock, poles for growing beans, etc. Shading may somewhat reduce rice yields but the farmers suggest that the trees may also contribute to increasing rice productivity by serving as "nutrient pumps" bringing up minerals from

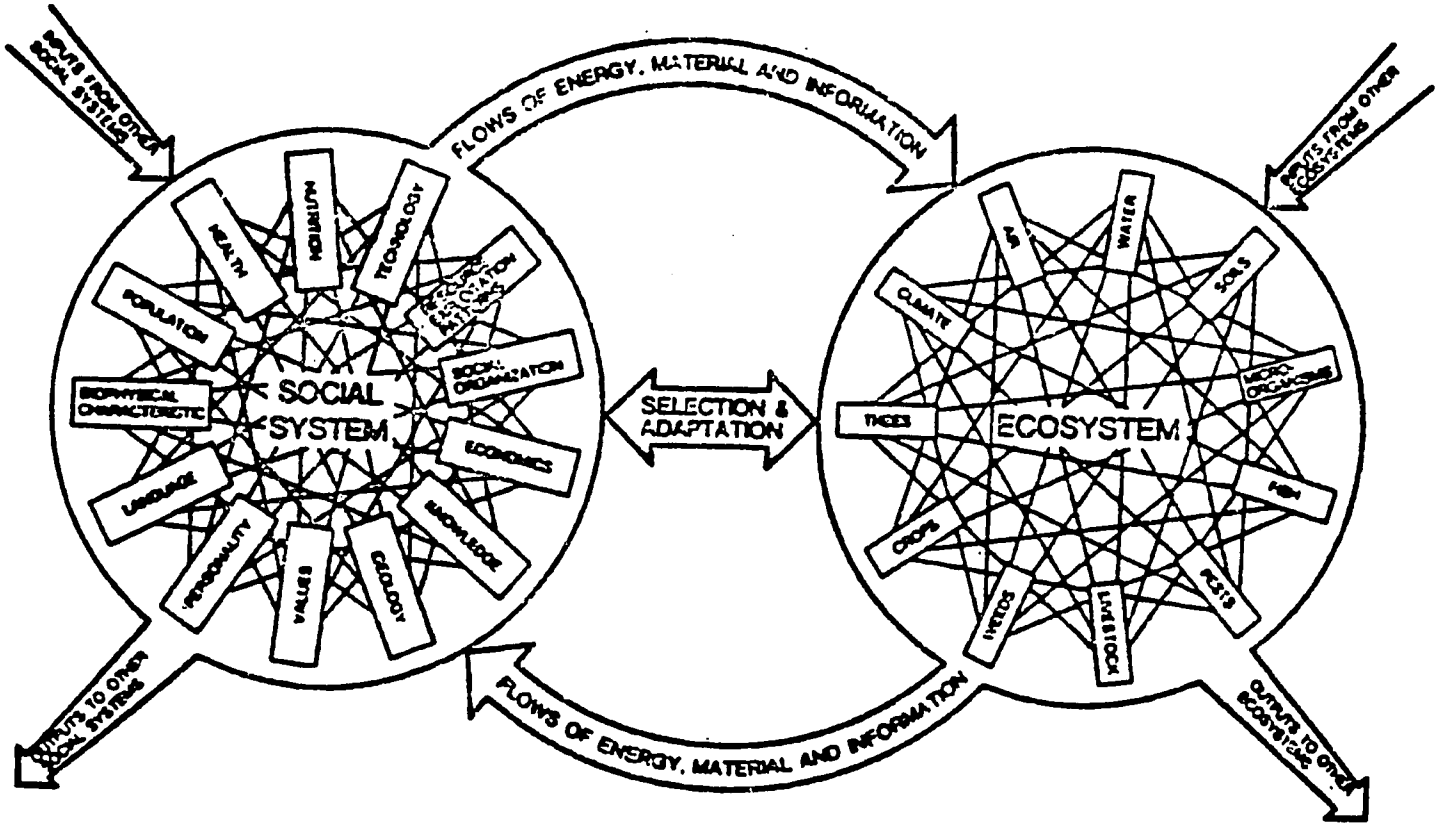

Figure A-3: Social system-ecosystem interactions.(Rambo 1983)

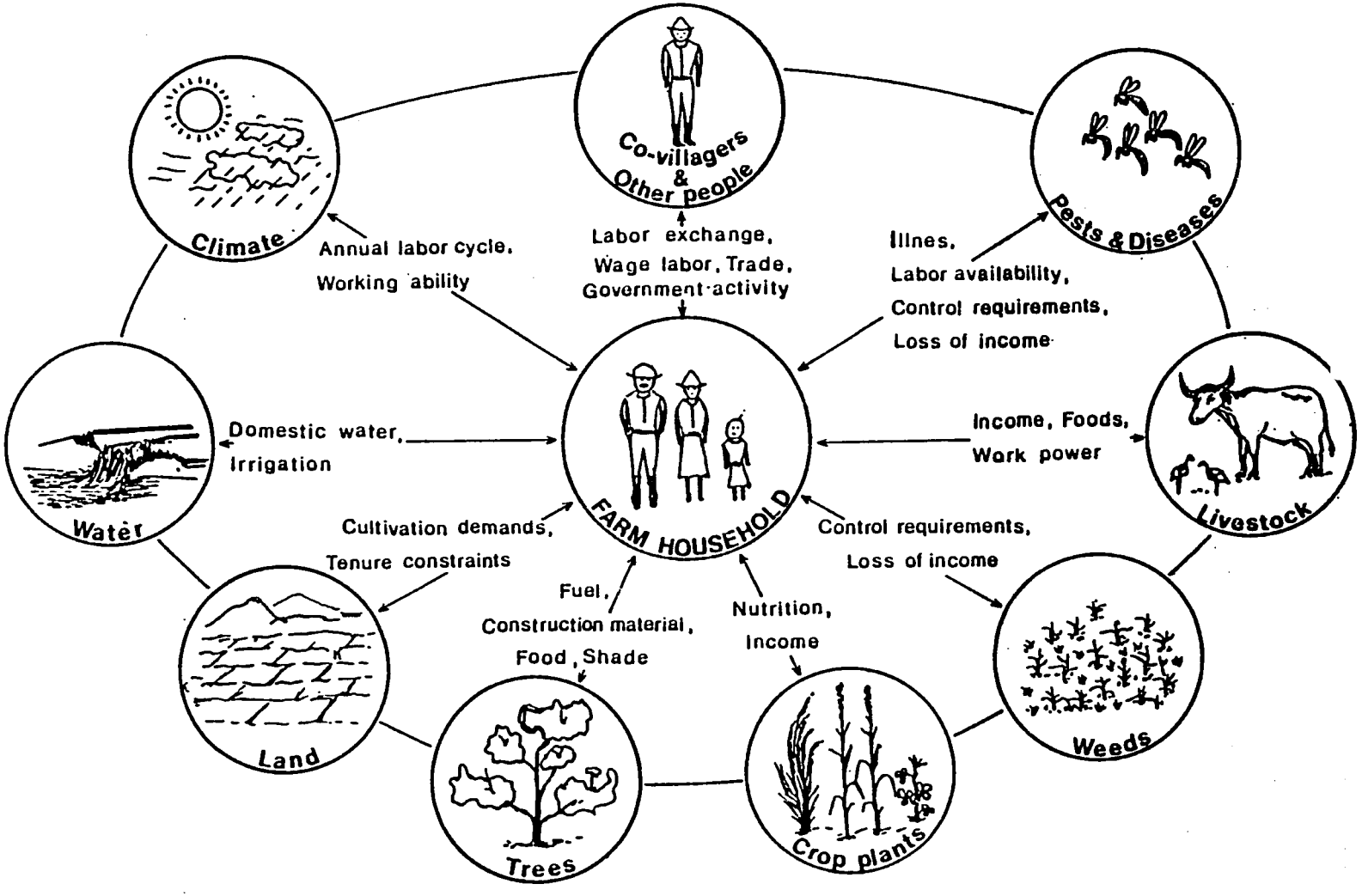

Figure A-4: The Northeast farm level resource system.

Source: KKU-FORD 1982:94, Figure 4.5.

deeper soil levels to the surface where they are available to the rice plants. Based on these findings, the research team suggested a number of key questions on the role of trees in paddyfields for in-depth investigation.

Another study reflecting the human ecology perspective is an exploratory study of variation in the types of food consumed by villagers at different seasons and the different components of the ecosystem from which they are obtained. It reveals that Northeastern villagers depend upon a wide spectrum of cultivated, wild, and purchased resources which they obtain from diverse sources which shift markedly in importance from season to season.

The most ambitious human ecology research effort undertaken by the FSR Project is the Household Record Keeping in Ban Hin Laad for a one year period. Detailed records were kept on all resources (wild, cultivated, and purchased) used by 17 households and their sources in various parts of the village ecosystem. Analysis of these data will provide the basis for constructing a comprehensive model of the village resource system and for assignment of quantitative values to the various resources flowing from different ecosystem components to the people. Some of this analysis, particularly from the spatial perspective, is currently being carried out by Mr. David Thomas, a Ph.D. student from the University of California at Berkeley, who assisted the FRS Project team in designing and doing the household record keeping.

Conclusions regarding the use of human ecology concepts

Human ecology research by KKU has already added considerably to the existing pool of information about rural resource systems in the Northeast. Perhaps the most important contribution is the demonstration of the great complexity of these systems and the diversity of ecosystem components that play a role in farmer survival.

More problematic is the contribution made by human ecology research to agroecosystem analysis and, especially, farming systems research. The evaluation team has been unable to identify any specific component research undertaken in response to findings of human ecology studies. In fact, most of the Project agriculturalists do not appear to recognize that such research has identified any problems for them to solve. Thus, although the "trees in paddyfields" report identified a number of possible problems for intensive disciplinary research there has been no follow up on these by disciplinary specialists. The gap between the qualitative, holistic analyses resulting from human ecology research and the need of the agricultural scientists for tightly defined and clearly structured research questions may simply be too wide to bridge at KKU at present.

One major constraint on development of human ecology as the source of conceptual insight for the FSR Project is the shortage of professional expertise in this complex, interdisciplinary perspective. No KKU staff member has had formal graduate training in human ecology. Several have participated in SUAN-EAPI human ecology training workshops. These workshops are short (2 to 6 week) intensive introductions to basic concepts. They are not intended to turn out professionally qualified human ecology researchers. The long-term

assignment by the Ford Foundation and the East-West Center of Dr. Terry B. Grandstaff, an ecological anthropologist, to work with Project staff, has provided some guidance in human ecology research. Grandstaff, however, has devoted most of his efforts thus far to development and dissemination of Rapid Rural Appraisal (RRA) techniques and has of necessity been able to spend relatively less time in working with KKU staff on expanding their understanding of the conceptual aspects of human ecology research.

Recommendations regarding human ecology

The evaluation team recommends that opportunities for more intensive training in human ecology be provided to KKU staff, both those in the social sciences and agriculture. Attendance at the summer session of the University of the Philippines at Los Baños MS Program on Environmental Science and Management would be one relatively economical way to provide needed exposure to human ecology concepts. Selected staff members might also benefit from six month to one year long research internships at U.S. institutions with human ecology research programs such as the University of California, Berkeley (Jeff Romm, Richard Norgaard, James Anderson), the University of Michigan Center for South and Southeast Asian Studies (Karl Hutterer), the Cornell University Rural Sociology Department (Walter Coward), as well as the East-West Environment and Policy Institute.

2. Agroecosystems Analysis

As employed at KKU, agroecosystems analysis refers both to a set of concepts about agricultural ecosystems and to a specific method for

carrying out interdisciplinary analysis of these systems. Both concepts and method are directly derived from Dr. Gordon Conway, a systems ecologist at the Imperial College, London, who has worked intensively with the Multiple Cropping Project at Chiang Mai University and, to a lesser extent, with the Cropping Systems Project at KKU. Conway's special approach to agroecosystem analysis was introduced at KKU in a workshop in December 1980.

In the Conway approach (Figure A-5), an interdisciplinary team first agrees on the boundaries of the system(s) to be analyzed and their place in the hierarchy of agroecosystems ranging from the farm field to the national level. The team then analyzes patterns and processes including system structure and spatial relations, dynamic processes that characterize relationships over time, and patterns of utilization and decisionmaking. These are then related to several "emergent properties" or performance indicators, notably "productivity," "stability," "sustainability," and "equitability." These discussions lead to identification of knowledge gaps and, most importantly, "key questions." The latter are supposed to represent especially strategic links between pattern, process, and emergent properties where making a small number of changes can lead to major improvement in system performance.

After the key questions have been identified, they are assessed in terms of the institution's ability to do useful research on them. Those for which it has a comparative advantage are then converted into the form of hypotheses for testing. Most, if not all of the hypothesis testing is done at the disciplinary or component level. Ideally, the process is an iterative one in which new answers are fed

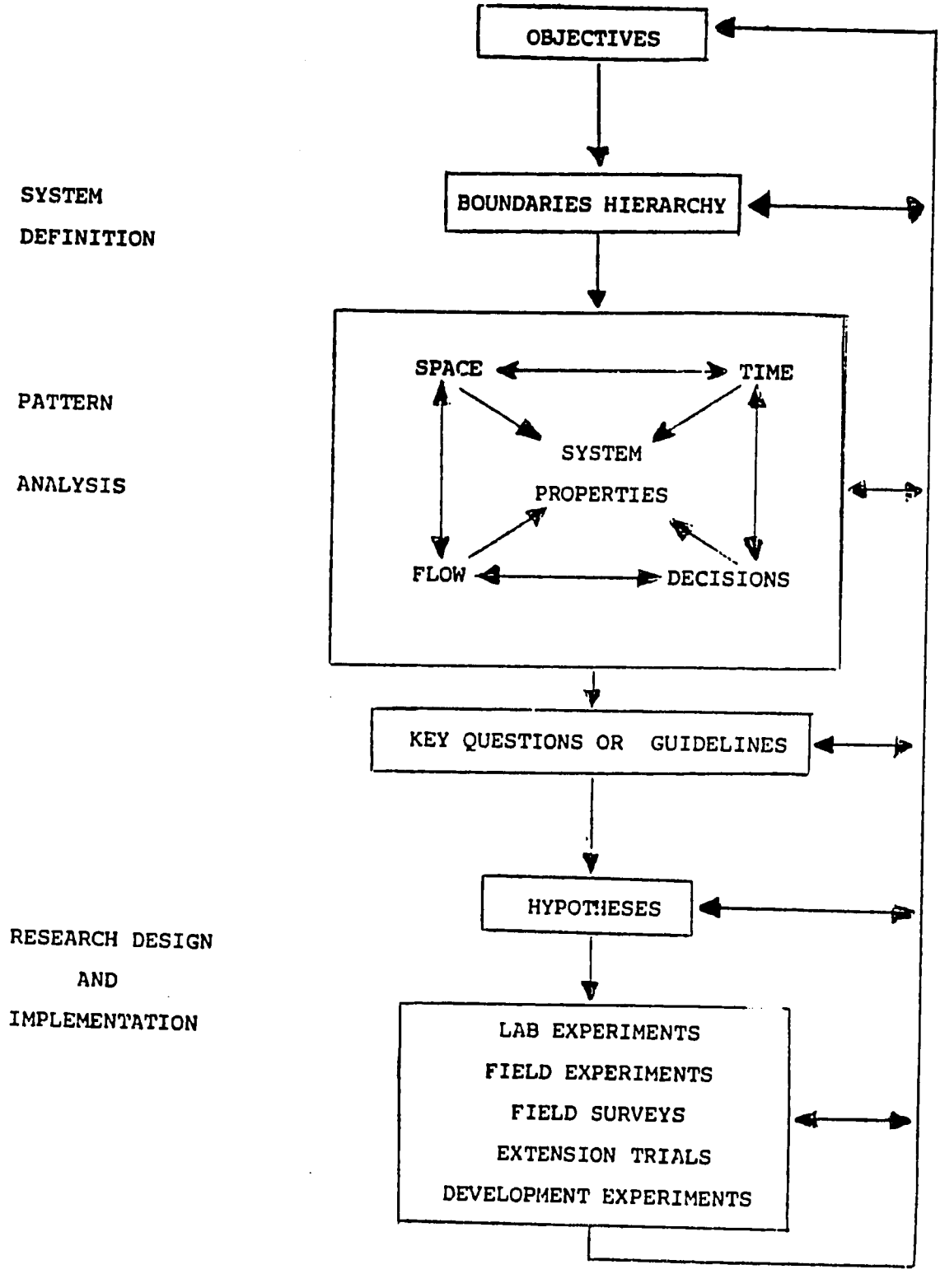

Figure A-5: Full steps of agroecosystem analysis (after Conway, 1982).

back into improved models of the agroecosystem, and identification of new key questions for further research.

The identification of peanuts after rice as a suitable technology for dissemination in Khon Kaen Province offers an example of the use of the agroecosystem analysis method by the FSR Project. In this case, agroecosystem analysis demonstrated that the key constraint affecting peanut production after rice in the Khon Kaen area was not the lack of technology per se but the lack of the adequately detailed understanding of the physical and socio-economic conditions under which farmers employed this technology successfully elsewhere in the Northeast. Use of this method provided a framework within which these conditions could be identified and the factors affecting use of the technology studied in great detail. Analysis of the peanuts after rice as already successfully grown in Surin revealed that soil type (sandy loam) and high soil moisture are key physical factors. Requisite socio-economic factors include a dependable market, a stable price, and a good knowledge of cultural practices on the part of the farmers.

After key physical and social factors have been identified, the technology can be tested for its validity in other areas where agroecosystem analysis reveals that similar conditions exist. Subsequent in-field tests revealed that cultural practices had to be modified to suit locationally specific variations. With this knowledge and experience, the project expanded its testing of peanut after rice into several additional locations in Khon Kaen.

Conclusions regarding the use of Agroecosystems Analysis

In assessing use of agroecosystems analysis at KKU it is necessary to separate the conceptual framework employed from the specific method of using interdisciplinary workshops to analyze agroecosystems. The workshop method will be discussed below in part B. Attention here will be on the conceptual framework employed for agroecosystems analysis.

It is important to recognize that KKU has adopted a specific analytic framework, i.e., that formulated by Conway, rather than having evolved its own framework out of a more general concern with agricultural ecology as a field of inquiry. Staff appear largely unaware of the existence of a considerable body of literature pertaining to several other different approaches to agroecosystems (as represented by the work of Miguel Altieri or Robert Hart, for example). That Conway's concepts are themselves in large part derived from systems ecology and, as such, are tied into major continuing theoretical debates in ecology, such as the empirical reality of ecosystems and the existence of emergent properties, is also not generally recognized. Instead, the Conway framework is accepted as a complete and correct blueprint for analysis of Northeastern Thai agroecosystems. No modifications have been introduced into the framework by KKU staff in the five years during which they have been employing agroecosystems analysis. The course notes for the graduate course on cropping systems, for example, almost exactly follow the original Conway model.

A number of problem areas in the conceptual framework employed for agroecosystem analysis have gradually become evident as it has

been used at KKU and at other institutions belonging to the Southeast Asian Universities Agroecosystem Network (SUAN). These were the subject of a recent SUAN-EAPI Workshop on Agroecosystem Analysis held at Khon Kaen University in January 1986. The major problems include identification of the unit for analysis, description of agroecosystem organization (system structure and functioning), selection and definition of significant emergent properties, and empirical measurement of these properties. Only two problems of special significance to the use of agroecosystem analysis by the FSR Project will be discussed here, the identification of the unit of analysis and the selection of emergent properties.

(a) The unit of agroecosystem analysis. Unlike human ecology, which takes a social unit (farm household, village) as its starting point and works outward from it to identify the ecosystem with which the social unit interacts, or FSR, which focuses on the physical unit managed by a specific farmer, agroecosystem analysis begins with a physically defined unit of production (paddy field, mini-watershed, the Korat Triangle) and seeks to identify the factors influencing the productivity or other emergent properties of that unit. In general, this results in a lack of congruence between the units of analysis in human ecology and farming systems research on the one hand and agroecosystem research on the other. This may explain why the major value of agroecosystems analysis to farming systems research has been at the field plot level, since this is often the only ecological unit that the two approaches share in common. For example, the agroecosystem analysis in support of the peanuts after rice experiments focused on identification of ecological factors (soil

type, retention of moisture) in fields in Surin Province where farmers were successfully growing this crop. Fields with similar characteristics were then identified in Khon Kaen Province and peanuts planted there using similar techniques to those employed by the Surin farmers.

(b) Selection of emergent properties. As initially proposed by Conway and employed in the first agroecosystem analysis of the Chiang Mai Valley, significant emergent properties were all biological in character, i.e., productivity, stability, and sustainability. Subsequently, during the workshop at KKU in 1980, Conway proposed inclusion of equitability, an essentially social measure of distribution of agroecosystem productivity among individuals. Unfortunately, it is not always recognized that these four properties are simply intellectual constructs rather than being inherent in the nature of agroecosystems. The properties selected by Conway may not always and everywhere be the properties of concern to either the farmers themselves or to rural development policymakers. Participants in the recent SUAN-EAPI Agroecosystem Analysis Workshop agreed that "autonomy" and "solidarity" are additional social properties that might be included in agroecosystem analysis in the future. They also raised serious questions about the definition of "stability" and "sustainability." These modifications to the agroecosystem concept will be further examined in a workshop to write agroecosystem case studies to be held in Honolulu in May, 1986 in which four staff of the FSR Project will participate.

Recommendations regarding the use of agroecosystems analysis as a conceptual framework at KKU

Agroecosystems analysis is an evolving set of ideas and concepts which are in large part derived from larger theoretical concerns in systems ecology. In order to employ these ideas more fruitfully, staff at KKU need to increase their knowledge of the underlying theoretical issues. Testing of the basic concepts against data on Northeastern rural systems should also be pursued much more actively than it has been so far. Participation of KKU staff in the SUAN-EAPI Agroecosystem Case Study Writing Workshop offers an initial opportunity to begin attempting to measure emergent properties such as productivity and sustainablity. Carrying this analysis through to completion should be a major priority of the FSR Project.

3. Farming Systems Research (FSR)

FSR is a research approach which seeks to identify the problems and needs of the farmers as viewed from the farmers' holistic perspective. It emphasizes the understanding of the farming systems as operated by the farmers by taking into consideration their resource constraints, environments, as well as the interdependencies among the activies of the farm households. Its purpose is, however, not only to understand the functioning of the farming system but to improve its performance.

Its operational method involves 5 logical steps, namely, the selection of the target areas and farmers, the identification of problems and the development of research base; the planning and designing of on-farm research; the implementation of on-farm research

and evaluation; and the extension of results. In practice, these steps are not sequential but iterative.

The first step is also called site selection and description. Its purpose is to delineate the areas and farms into homogeneous units (sometimes called "recommendation domains") in terms of resource availability and biological, physical and socio-economic environments. This information is then used to identify the problems farmers face and how such problems can be overcome. This then leads to the design of technology and on-farm testing in which farmers are active participants. The results are then evaluated in terms of biological and technical feasibilities, economic viability and social acceptability. If the technology in question meets such requirements, it can be extended on a wider scale.

Although farming systems research also looks at other linkages and opportunities, it focuses on technology as a means of improving farm performance. In other words, as indicated in the KKU-FSR Project paper, it is a "commodity approach with farming system perspective." This is the central theme of the Project's operational strategies. In actual implementation, the Project not only follows the FSR process proper but also undertakes studies of farmers' technologies and testing of farming patterns and component technologies in the areas outside the project site, a process of farmer-to-farmer technology transfer. It also engages in training and communication activities through its linkage with action agencies (see Figure A-6).

At present, the project is involved with all aspects of FSR process from site description to multilocational testing and evaluation. It is also studying the existing farming practices in

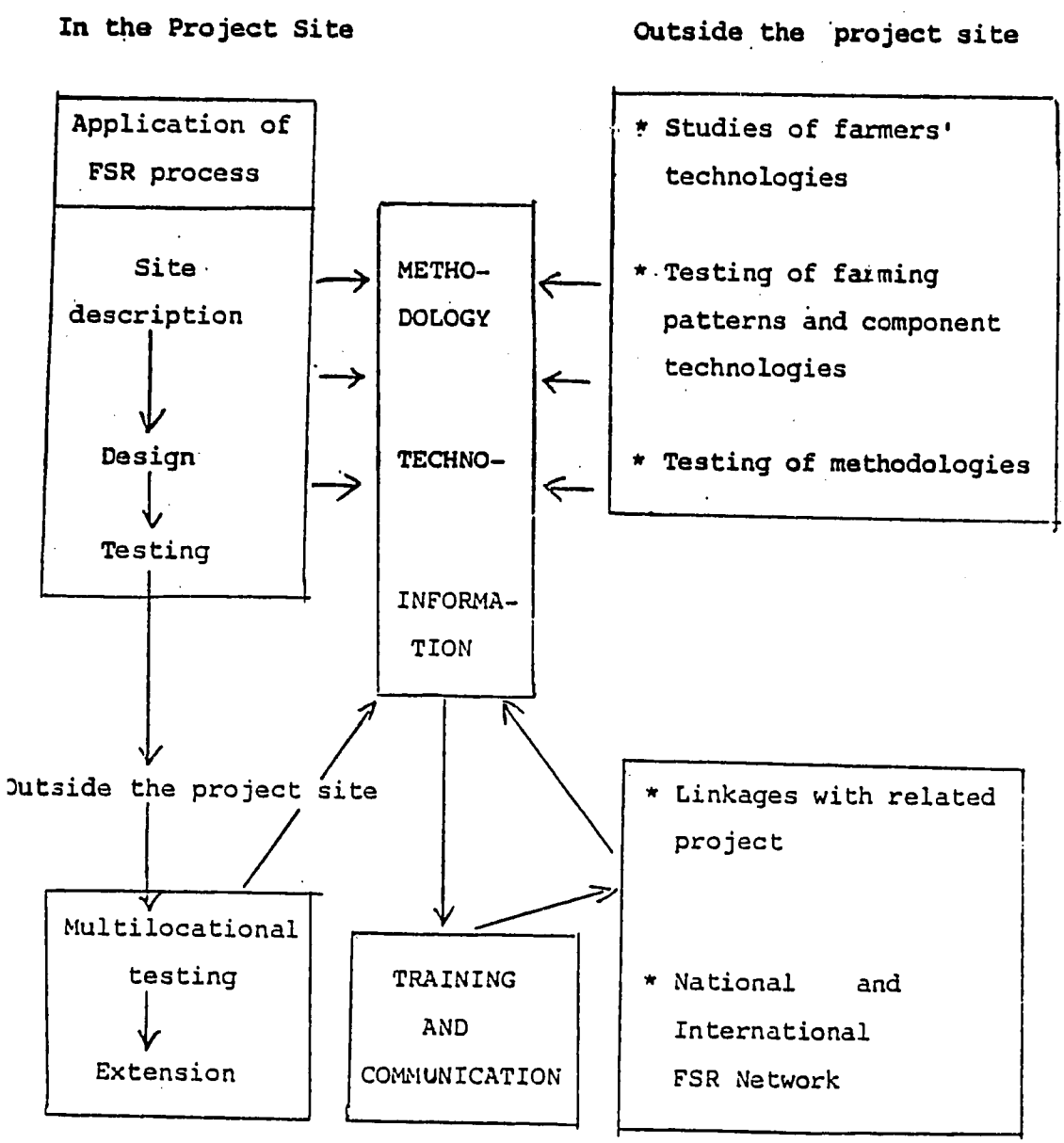

Figure A-6: Scope of work of the KKU-FSR Project and its relationships with the project objectives.

other areas: upland rice in Tambon Khon Kaen, sesame before rice in Burirum, dry-season vegetable production by shallow well irrigation in Roi-et, small holder dairy farming in Khon Kaen and Chaiyaphum and backyard swine production in Nakhon Phanom and Surin.

For training and communication activities, the project started an elaborate training program with the DOAE by using the peanut after rice multilocational testing program as a spring board. The DOAE assigned one of its Subject Matter Specialists (SMS) to work closely with the project from October 1984 to June 1985. The project is also cooperating with the DOAE and the DOA in the cassava replacement program for 1985/1986 cropping season in the testing of upland rice, kenaf and field corn by using procedures similar to those used in the peanuts after rice program. In addition, the project organized a series of training and workshop programs to disseminate the FSR concepts to the two line agencies for various levels of their personnel.

Conclusions regarding the use of Farming Systems Research

Since the KKU FSR Project has adopted "the commodity approach with farming systems perspective" as its model, it is hardly surprising that most research undertaken to date is essentially component research. Systems questions have not been pursued with equal intensity. Being an academic institution, KKU has a definite role to play in the development of theory and the advancement of knowledge and the FSR Project should provide many opportunities to pursue this role. But with the scope of work of the project and the pressure surrounding it, the project has to consider critically where its priorities lie.

Recommendations regarding the use of FSR as a conceptual approach at KKU

Farming systems research is viewed by many Project staff as an operational blueprint for doing applied research. In actuality it is far from that, being no more than a set of rather vague guidelines for a series of sequential steps to follow in doing on-farm research. For example, researchers are directed to begin FSR with "site selection and description" but the kinds of information that are likely to be significant in describing the site are not specified. There is thus still a need for operational models of the rural systems of the Northeast to guide FSR data collection and analysis. Development of such models should be theoretically informed rather than ad-hoc, taking advantage of the conceptual understandings offered by human ecology and agroecosystems analysis. The FSR Project has already taken the first steps in this direction by incorporating "area analysis", a simplified form of agroecosystem analysis, into its site selection and description activities. The evaluation team fully supports this initiative to develop a more operational approach to FSR. We recommend that work in this area continue to be a high priority for Project scientists.

Overall conclusions regarding conceptual approaches used by the FSR Project

The FSR Project has employed an unusually wide array of conceptual approaches ranging from the very general (human ecology) to the very specific (FSR). There is no question that the attention paid to these approaches has greatly increased the salience of the systems view in the thinking of project researchers. In particular, there is

much increased awareness of the interplay between social and ecological factors in farmer acceptance of new component technology. This represents a major advance from the situation at KKU before initiation of the project.

The depth of staff understanding of these concepts is more open to question. Human ecology, in particular, appears to be employed more as a legitimizing label than as a theoretical basis for generating actual research. Agroecosystems analysis has been adopted as a codified model rather than a set of theoretically informed assumptions requiring further refinement and testing against real world data. The farming systems approach is especially prone to cookbook application. It is hoped that as they gain experience in the use of these concepts, project staff will increasingly subject them to the critical scrutiny which they deserve.

A major problem with the use of the hierarchy of conceptual approaches employed by KKU (Figure A-2) is the absence of feedback loops between studies employing the different approaches. Each of the three approaches is treated as if it were independent of the others. It is difficult to find examples of new findings generated by research employing one conceptual approach, e.g., human ecology, directly influencing design of work employing another approach, e.g., farming systems research. The use of agroecosystems analysis to support FSR on peanuts after rice is one outstanding exception.

The failure of new empirical research findings to influence the basic conceptual approaches is also a source of concern. All of the conceptual approaches used at KKU are new, all are highly imperfect, and all badly need to be tested and modified in the light of new empirical understandings of the rural Northeast.

Recommendations regarding conceptual approaches used at KKU

The evaluation team is not suggesting that KKU aspire to be a world class theoretical institution. Given the interests and capability of KKU staff and the institutional constraints under which they must work, attempting to specialize in theoretical development could only result in failure and frustration. We do believe, however, that greater attention should be paid to understanding and refining the conceptual approaches employed by the FSR Project. The goal should be to develop an interactive relationship between theoretical formulations and applied research, not to emphasize one at the expense of the other.

B. METHODOLOGY FOR RURAL SYSTEMS RESEARCH

Farming systems research at KKU is guided by three fundamental premises. The first premise is that researchers need to find ways to learn from the farmers. It is assumed that the farmer has a more detailed and comprehensive understanding of his own specific agroecosystem than any outsider, however expert, and that tapping into this "indigenous knowledge" offers the most economical way to discover points in the system where application of scientific expertise can help to overcome constraints on production. Many of the methodologies employed in the FSR Project are used because they promise to help give access to the farmer's world.

A second premise influencing choice of methodology is the belief in the value of interdisciplinary research. The farmer interacts holistically with a complex agroecosystem, therefore, research should be conducted by interdisciplinary teams capable of collectively embracing this complex whole.

A third premise is that speed in obtaining results is critical. The problems of rural development in the Northeast are large and rapidly increasing, consequently it is incumbent upon KKU researchers to start providing useful answers now, not ten years from now. Methodologies that promise quick returns are thus favored over those requiring a longer time to produce useful results.

Guided by these premises, the FSR Project has emphasized use of four special methods (1) Rapid Rural Appraisal; (2) Agroecosystem Analysis Workshops; (3) Village-level Monitoring; and (4) Farmer-to-Farmer Extension.

1. Rapid Rural Appraisal (RRA)

As a method by which interdisciplinary teams can rapidly tap farmer knowledge to identify constraints for in-depth component research, RRA would appear to be made-to-order for use at KKU and, in fact, since its inception the FSR Project has made extensive use of this method, with more than 20 RRA's completed to data.

Because RRA methodology has recently been exhaustively described in the papers presented at the International Conference on Rapid Rural Appraisal held at Khon Kaen University in September 1985, there is no need to examine it further in this evaluation report. Instead, we will focus our attention on the results produced by use of this method and the impacts of its use on FSR Project activities as a whole.

Use of the RRA method in crop and social science research

The RRA method has been used in carrying out 12 research activities under crops and social science sections of the project.

All of these are topical RRA's, e.g., Commercial Vegetable Production in the Rainy Season in Ban Hin Laad, Socio-economic Characteristics of Ban Hin Laad, etc. These studies have in general helped the researchers to increase their understanding of the farmers' environments, what the farmers do, how they do it, how long they have done it, and why they do it in the way they do. With the exception of the studies that are general in nature, e.g., Socio-economic Characteristics, Species of Vegetables and Fruit Crops, and those related to the household record keeping activities, e.g., Rice Production, the topics of these studies have lacked a well formulated conceptual basis. They were not identified within the farming systems perspective but originated instead from the interest of individual researchers in the sections. As a result, the information gained has not contributed as much as it might have to the overall understanding of the functioning of the farming systems. If the goal of developing of methodologies (see section D below) is to be realized, serious effort must be made to identify problems for study in systems perspective. RRA can then be used to detect whether or not the problems identified are relevant and its findings will help increase the understanding of the functioning of the systems.

Use of the RRA method in animal science

During the period from October 1984 until December 1985, 12 studies in animal science were conducted employing the method of RRA. In some studies, RRA was used to supplement the monitoring process but the method was most commonly used to study two types of topics, (1) general topics, such as Smallholder Dairy Farming, Backyard Chicken

Raising, and Backyard Swine, and (2) specific topics, such as use of particular crop residues as animal feed. Information contained in written reports of the RRA's on general topics appears on the whole to be rather superficial and too descriptive to be useful for the development of future research guidelines or topics. However, the information obtained greatly increased the general understanding of animal production systems by the researchers at the initial stage of research planning. It's greatest value was in showing them that many of the commodity research approaches which they initially planned to employ would not be workable in the village setting. The application of RRA to obtain information on specific topics, such as certain crop residues, appears more useful for generating research problems, as is evident in the reports on "use of peanut tops" and "use of red cowpea tops". In these reports it was found that the researchers were able to identify the relationship among crop production practices with possibility of utilization of crop residues as animal feed. This then could lead to initiation of further research topics, such as the effect of harvest of peanut tops as animal feed on peanut yield, or the effect of residual insecticide in red cowpea used as animal feed.

The RRA method has also helped the disciplinary team members to orient their thinking toward an interdisciplinery approach, as well as to promote closer acquaintance between researchers and farmers at the target site.

Because the results obtained from the RRA usually do not provide definitive information about subject matter, follow-up in-depth studies are necessary to obtain concrete and accurate information on specific topics. At this point in the project sufficient information

about general aspects of animal production has been obtained through the RRA method. What is still generally lacking is identification of researchable problems concerning livestock production in villages, and then to follow up with in-depth research on a particular problem in order to obtain solution or answer to that problem.

Conclusions regarding use of RRA by the FSR Project

Use of RRA has produced a number of important benefits for the FSR Project. The experience of working together in small teams in the villages has definitely improved communication between members of different disciplines. It has been particularly important in enhancing the standing of the social scientists within the project. RRA was one activity where they could readily make a positively valued contribution to achievement of group goals.

Use of RRA methods has also helped to give a sense of forward momentum to the Project at an early stage in its development. Problems were identified for study, rapid field appraisals conducted, and reports written-up and disseminated, all within a matter of months from the initiation of the project. Undoubtedly, this very early generation of tangible products has contributed to the evident high morale of KKU researchers and has sustained their high level of personal commitment to achievement of longer-term project goals.

Perhaps most important of all, use of RRA has brought significant international recognition to KKU. The holding of the Ford Foundation sponsored International Conference on Rapid Rural Appraisal brought the work of KKU in this area to the attention of leading world specialists and established KKU in their eyes as a major source of new

developments for this method. That Robert Chambers, one of the founding fathers of RRA, should write, "I am more delighted than I can say at the initiative you have taken at Khon Kaen University in developing RRA and pushing at the frontiers of the subject. Khon Kaen University is now the world leader in this" (letter to Terd Charoenwatana of 16 September 1985), represents no small accomplishment for a regional university. The evaluation team wishes to emphasize its recognition of the very great value of RRA to the FSR Project in this regard.

The RRA expertise developed by KKU staff in the course of working on the FSR Project is also having beneficial impact on other development activities of interest to USAID, both in Thailand and other Asian countries. KKU staff who first learned how to do RRA through their involvement in the FSR Project have already made major contributions to other development research activities, most notably the social forestry project jointly implemented by Kasetsart and Khon Kaen Universities and the Royal Forestry Department with Ford Foundation fundings.

The evaluation team is concerned, however, that disproportionate attention is being given to RRA as a method and insufficient attention paid to questions of content, quality, and utilization of findings to achieve the larger objectives of the FSR Project. Historically, excessive concern with methodology in the abstract has been a sign, if not the cause, of intellectual sterility in science, with researcher energies focused on debates about definition and form rather than on generation of new empirical understanding. There are already signs of such scholasticism in the RRA Conference papers, e.g., arguments about

the precise number of days to be devoted to a rapid appraisal or the number of researchers that should make up an RRA team. Much less attention is paid to identification of significant questions to study.

Recommendations regarding the use of RRA

The evaluation team suggests that the FSR Project pay much more attention to the question of how topics for RRA's are identified and assigned priorities and how findings resulting from RRA's are to be used to guide future component research by the Project. There appears to have been some proliferation of RRA's simply for the sake of using the methodology itself rather than because it was necesssary to collect data of kinds dictated by the systems framework of the FSR Project. We suggest that in the future there is the need for very careful selection of topics that are most likely to directly contribute to identification of new research questions that can be followed up on by the component sections. Rapid Rural Appraisal should be viewed as a useful tool for helping to achieve overall project objectives, not as an end in itself.

Recognizing that KKU has made a very substantial investment in developing staff expertise in RRA methodology, we suggest that the university should continue to exploit its initial comparative advantage in this area. Rapid publication of the proceedings of the recent RRA conference will help to make the university's capabilities known to a wider audience. Publication of carefully selected and edited RRA reports already produced by the FSR Project may also be desirable as a way of attracting further national and international attention to KKU. The study on "fuelwood situation and farmers'

adjustment in Northeastern Thai villages," for example, appears to be a good candidate for publication in the International Tree Crops Journal or the new ICRAF journal on agroforestry systems.

2. Agroecosystem Analysis Workshops

Extensive use of the agroecosystem analysis workshop format first developed by Gordon Conway has occurred at KKU. This method relies on bringing together specialists from several different disciplines for a few days of intensive analysis of existing data on specific agroecosystems. The approach has proved particularly valuable for preliminary identification of system boundaries and important constraints on system performance, and posing of key questions for subsequent component research. The successful use of this method in the peanuts after rice study has already been described.

Conclusions regarding the use of Agroecosystem Analysis workshops

The major problem with the workshop approach at KKU is the difficulty in ensuring research follow-up on key questions generated by this process. Beginning with the first agroecosystem analysis workshop held in December 1980 many key questions have been identified but relatively few of these have been taken-up by disciplinary specialists for further research. As also tends to be the case with RRA, workshops may produce a greater subjective sense of progress than is justified by empirical results. Organizing and running workshops is also highly labor intensive and may interfere with the ability of staff to pursue other work which may prove more rewarding in the longer term. The evaluation team has no major recommendations to make

regarding the use of this methodology which is already well understood by FSR Project staff.

3. Village-level Monitoring

Several longitudinal studies have been undertaken in Ban Hin Laad, the village selected for intensive analysis by the FSR Project. These include Household Record Keeping, Crop Monitoring, and Livestock Monitoring. All are concerned with looking at behavior of the agroecosystem or its individual components over time, especially over the course of the annual seasonal cycle.

Household Record Keeping, a project managed by the Social Science Section, is the most ambitious of the longitudinal data collection efforts. Members of 17 sample households were trained to keep daily records of all activities by all household members, along with all resources derived by the households from the agroecosystem and all inputs made into it.

A separate effort to monitor cropping patterns of sample households was subsequently undertaken by the Crops Section. This involved keeping of records on the sequencing of cultivation activities in different fields with the objective of identifying possible spatial and temporal interactions between these activities. The Animal Section also carried out its own monitoring of activities relating to livestock. Unfortunately, there is only very partial overlap between the sample households in the three different monitoring activities (2 households, for example, are included in both the Household Record Keeping and the Animal Monitoring) so that relating the findings to each other is likely to be difficult.

Conclusions regarding village monitoring studies

The longitudinal studies absorbed a great deal of researcher time during the first year of the project. The Household Record Keeping was particularly labor intensive requiring constant supervision of field assistants and editing of the records on a weekly basis. Analysis of the resulting huge pool of data is a major task. Unfortunately, only one social scientist has both the quantitative skills and the interest in this topic to do this difficult job. Consequently, results are slow to appear and it is questionable if they will be available soon enough to influence the design of later stages of the project. This is especially unfortunate because this study offers the best prospect of producing a relatively comprehensive description of a total village-level agroecosystem.

Recommendations regarding monitoring studies

The evaluation team suggests that additional resources be made available to speed up the analysis of the household records. If necessary, Project funds should be used to obtain the services of consultants to assist in the computer processing of the very large data files generated by the monitoring activities.

4. Farmer-to-Farmer Extension Methodology

The farmer-to-farmer methodology employed by the FSR Project is aimed mainly at the transfer of appropriate technologies already available in some parts of the Northeast through encouraging farmers to be educators for other farmers, whereas technical personnel act as facilitators. A good example of the use of this methodology is

provided by the extension activities for peanut after rice in Ban Sum Jan.

The farmer-to-farmer method is also employed for the purposes of (1) understanding existing production systems, (2) interdisciplinary learning, (3) allowing farmer participation in research planning, as well as (4) farmer training. This is evident in the reports of the animal science group concerning dairy cattle raising in Ban Sum Jan, Ban Huey Rai, and Ubonrat Settlement, in which the farmer-to-farmer technique was used simultaneously with the RRA method in order to achieve the aforementioned purposes.

The techniques employed in the farmer-to-farmer method are mainly (1) farmer field visit, (2) field day, (3) farmer workshop. For peanut after rice extension, the activities began when two selected farmers from Sum Jan, Khon Kaen Province, visited peanut fields of farmers in Surin Province, along with an FSR Project staff member. After seeing the practices employed succesfully in Surin the Sum Jan farmers then tested and adapted the technology of growing peanut after rice in their own fields. Finally field days were organized jointly by the FSR Project and the Khon Kaen Agricultural Extension Office to give farmers in other districts or areas the opportunity to learn about the success obtained by the Sum Jan farmers.

The method of farmer-to-farmer extension of peanut-after-rice technology was quite effective. But the time and effort required for testing this technology as well as preparation for farmer visit and field days were quite substantial. It took 2 years for the development of this technology at Sum Jan, and then at least 3 years before this technology was extended from Sum Jan to farmers from 20 additional districts in Khon Kaen Province.

Conclusions Regarding use of Farmer-to-Farmer Extension Method

The farmer-to-farmer extension technique shortens the usual distance of technology transfer, which starts from university researcher to extension worker, and from extension worker to farmer. In addition, farmers can understand each other better and faster since they use the same language at the same level of understanding. Another merit of this method is that various people outside the formal extension system, such as monks or teachers, can also be usefully involved in the process. The greatest limitation is that the technical as well as extension personnel have to spend a great deal of time in identification of appropriate technologies, testing and improving techniques under various conditions, as well as assisting the farmers in extending them.

The KKU/FSR Project personnel have been able to pinpoint some additional available technologies which can be extended to farmers, e.g., farmer cultural practices, seeds, experiment station technologies, or laboratory technologies such as artificial insemination in cattle and buffalo. However, as mentioned before, all these technologies have to be first tested and modified or adjusted to suit real farm conditions.

Recommendations regarding the use of Farmer-to-Farmer Extension Methodologies

The farmer-to-farmer method used by the FSR Project can only slowly expand since the expertise and available qualified personnel are limited. In addition, a good and stable linkage with the extension agencies is very necessary. It would be most desirable if

the DOAE subject matter specialists (SMS) could be assigned to share experiences in certain research activities of the Project, as well as organize the activities required by the farmer-to-farmer methodology.

Overall conclusions regarding FSR Project methodology

All of the studies conducted in the Project's first two years should be seen as having had to fill two functions: the manifest one of generating new understanding of Northeastern Thai farming systems, and the latent one of integrating scientists of diverse disciplinary backgrounds into an interdisciplinary project. Because of this need to achieve both objectives, the project has had to face a number of very difficult tradeoffs in selection of methodology. The perceived need to rapidly generate at least preliminary understandings of farming systems in order to provide the basis for research on new technologies favored selection of short-term over in-depth approaches. The need to integrate scientists of widely varying competence and experience in interdisciplinary teams also weighted the choice toward these methods. In particular, it was necessary to find methods that would allow the social scientists to make contributions at an early stage that would validate their involvement in the project.

Under these circumstances, the decisions by Project leaders to heavily rely on RRA's to generate new information about the rural situation and to use agroecosystem analysis workshops to help organize existing data into coherent form are fully justified in the view of the evaluation team. Both methods promote interdisciplinary cohesion at the same time as they generate visible products in a relatively brief time frame. The large volume of research reports produced by

the FSR Project during its first two years offers impressive evidence of the extent to which this strategy has been successful. More important than written material in the long run, however, is the very real change that has occurred in cross-disciplinary working relations at KKU in the course of the project. Scientists who scarcely recognized each other two years ago now work together as close colleagues. The status of the social scientists has particularly benefitted, in large part because of the skills they displayed in doing RRA's. There is now a greater demand for their services by the Crop and Animal Sections of the Project than they can fill.

The evaluation team is concerned, however, that methodology is being emphasized for its own sake, independent of the specific questions that need to be asked about Northeast Thai farming systems. Some RRA's appear to have been undertaken without careful prior identification of how their findings would contribute to development of further research. The basic problem is that methods, however well thought out, are only as good as the scientists who employ them. There is no way to substitute methodologies, however elegant, for theoretically-informed researchers. Only scientists possessing deep understanding of a problem area, be it cosmology or the human ecology of Isan, are likely to successfully create important new understandings out of the chaos of empirical reality. It is the confrontation between theory and data, not the collection of data itself, that most often leads to scientific advance. Theoretically naive researchers are as likely to generate trivial findings using RRA as they are when employing conventional survey research methods.

Overall recommendations regarding use of methodologies by the FSR Project

It is not being suggested that KKU abandon the use of RRA or Agroecosystem Analysis Workshops. Instead, more consideration needs to be given to linking empirical investigations to the conceptual approaches employed by the FSR Project. One of the virtues claimed for RRA is that it is iterative, allowing rapid self-correction of course while the study is in progress. It would be a major advance if this capability could be extended from the purely methodological level to the level of interaction between data and concepts. Neither mindless empiricism nor data-free theorizing is advocated; instead using powerful new data collection methods such as RRA in a theoretically informed manner to understand Northeastern rural systems should be the objective.

C. INSTITUTIONAL ASPECTS INFLUENCING RURAL SYSTEMS RESEARCH BY THE FSR PROJECT

The organization of the FSR Project is clearly described in several Project documents so will not be dealt with at length here. It is sufficient to note that it is organized into three sections, Crops, Animals, and Social Science, under the overall direction of a Project Core Group made up of the leaders and deputy leaders of each of the three sections. Although in principle the Project Core Group might be expected to be concerned with integrating contributions of disciplinary sections into an overall systems framework, in practice the work of this group is almost wholly administrative. Thus, there is no unit within the organizational structure of the project charged with the formal responsibility for performing systems analysis. The

lack of such a systems analysis unit works against achieving the integrated, interdisciplinary understanding of rural development in the Northeast that is the central objective of the project.

A second institutional constraint on interdisciplinary systems research is the physical dispersion of Project staff. Each of the three sections is located in a separate building. The Project central office is located in the Agronomy Building. This is convenient for the Crop scientists, who represent the majority of participants in the project, but is much less so for the social scientists who are located in their own building across campus. There is no common room where staff from different sections can informally meet and exchange ideas and information. With the exception of agricultural economists, who are based in the Faculty of Agriculture, the only time we have observed social scientists at the Project Office is on the occasion of formal meetings.

A third constraint on interdisciplinary work is the imbalance in size and research experience between the different disciplinary sections. Crops is both by far the largest and most experienced section. Social Science is next in size but is composed of relatively junior and inexperienced researchers. Because the social scientists only began to participate in the FSR Project at a relatively late stage in its gestation, they also have had relatively less opportunity to participate in human ecology and agroecosystem analysis training workshops. Animals is the smallest section but is headed by a senior researcher with considerable experience in farming systems research.

A tendency for researchers to disperse their efforts across a number of sub-projects is another constraint on systems analysis at

the project level. This tendency, which is a common feature of Thai academic life in any case, is accentuated by the demand for interdisciplinary participation in most studies conducted by the disciplinary sections of the FSR project. Thus, any one social scientist, in addition to involvement in the substudies of the Social Science section, will also be involved in several studies being conducted by the Crop and Animal sections as well.

Involvement of researchers in activities outside of the project is also a growing factor in dispersion of effort. As Khon Kaen University is recognized by outside donor agencies as an important rural development research center, competition for staff time is also increasing. For example, the Ford Foundation, in launching a new research project on social forestry, diverted the attention of one of the best qualified social scientists from work on FSR for a several month period. In this particular case the researcher obtained new experience in designing and conducting interdisciplinary studies which, in the long term, will be of value to the FSR Project. The short-term cost to the Project was high, however.

The initiation of the Research and Development Institute's competitive grant program (also USAID funded) to support research proposals submitted by KKU staff has also tended to divert some staff away from full-time involvement in the FSR Project. Staff who were perhaps somewhat unenthusiastic about joining a group research effort were offered an alternative source of funding for individual projects bearing no necessary relationship to the on-going FSR Project. Several senior Animal Sciences staff, for example, were successful in obtaining RDI grants and have had no further involvement in FSR.

Some ambiguity exists about the nature of the relationship between the FSR Project and the Ford Foundation funded project on Rural Systems (Ford-III). There is a great deal of overlap in terms of both areas of interest and staff participation in the two projects. In fact, the evaluation team has not even tried to distinguish between FSR and KKU-Ford activities in earlier years because of this overlapping. Development of RRA methodologies, for example, was a major concern of the Ford project but KKU staff primarily employed this new method in the context of FSR studies. In this particular case the FSR Project was fortunate in being able to piggy-back on the activities of another grant. The precise relationship that is to exist between the FSR Project and the current stage of the Ford grant (Ford III) is still being worked out but it is expected that it will also strongly support the achievement of the goals of the FSR Project.

A major constraint on the research productivity of Project staff, particularly senior staff, is the heavy representational and administrative burden that they carry. So much of their time is taken up with meetings and administration, that virtually no time is left for thinking, doing intensive analysis of data, or writing. During just the three weeks that the evaluation team was in residence, Dr. Terd Charoenwatana, the Project Director, had to meet 16 Thai and foreign visitors in six separate groups. Each meeting required from one to four hours of his time. Particularly burdensome is the need to present frequent background briefings on the FSR Project to visitors with no prior knowledge of either the Project or the Northeast of Thailand. Each such briefing requires the presence of several senior staff for at least 2 hours.

Routine administrative work, including handling menial duties that would be delegated to clerical staff in Western institutions, also consumes a large share of the time and energy of the Project leadership.

The unavailability of qualified editorial assistance, has forced senior researchers to assume responsibility for editing project publications, especially those in English. In addition to taking much time and energy, this has created a real bottleneck for disseminating project findings. Numerous draft reports are still unpublished because of the lack of time to edit them.

Conclusions regarding institutional aspects

Interdisciplinary rural systems research of the type being attempted by the FSR Project is a new kind of research at KKU. There were no models ready to hand that could have been employed in organizing the Project. Development of an institutional base for the Project has consequently been on an essentially ad-hoc basis. Senior staff have been so heavily committed to development of concepts, organizing field research, and routine administration, that they have had little time left to think about Project organization. Yet institutional problems are a major constraint on the present and future abilities of the Project to make further progress in employing the systems approach to rural development research. The Project leaders need to give their attention to reducing or eliminating some of these constraints.

Recommendations regarding institutional aspects

Interdisciplinary systems research requires that as much or more attention be paid to understanding of the total system as is paid to research on its components. At present, no one in the FSR Project has formal responsibility for the systems level of analysis. The evaluation teams recommends the early formation of a special Systems Analysis Section composed of senior researchers from the component sections. This group would be charged with using information already generated by the project to develop improved system models and then using these models to help direct choice of future studies by the disciplinary sections.

Frequent interaction between scientists from the different disciplines participating in systems research, both in formal and, probably more important, informal contexts, is an essential ingredient in project success. The evaluation team recognizes that KKU is unable to provide a separate building for the entire FSR Project at this time but suggests that, at a minimum, the Project's Central Office and a staff common room be established outside of the Faculty of Agriculture.

Finding ways to provide introductory level training in human ecology and agroecosystems analysis to new participants in the Project, particularly those from the social sciences who only became involved after the initial series of training workshops was already finished, is important to maintaining a shared sense of research objectives and conceptual approaches. Short courses offered by other member institutions of SUAN may offer one useful training opportunity.

Dispersion of staff attention across a large number of small, frequently unrelated research projects represents a major threat to the integrity of the FSR Project. The evaluation team recognizes the difficulty of imposing restraints on the freedom of participating scientists to accept outside work. In the absence of enforceable negative incentives, e.g., reduction or loss of stipends, we suggest that maximal use be made of such positive incentives as are available to the Project leadership, e.g., rewarding dedication to the work of the FSR Project by sponsoring trips to international conferences, giving priority to publication of reports written by those researchers who dedicate their full time to Project activities, etc.

Reducing the representational and administrative work load carried by senior staff is imperative if they are to be able to give their attention to the conceptual and methodological issues already described in Sections A and B. The evaluation team recommends that priority by given to recruitment of a competent administrative assistant, ideally an individual fluent in both Thai and English, to take over much of the routine administrative work currently done by the Project Director and the Section Leaders. Because the position is a temporary one funded by soft money, it will be necessary to offer a salary considerably above the civil service scale to attract someone with the necessary qualifications. Given the current wastage of scarce scientific resources on doing routine administrative work, such expenditure is fully justified in our view.

The Project would also benefit from having the services of a qualified consultant to develop a set of slide-tape presentations on its activities. These slide-tape presentations could be used for

introductory briefing to visitors, thus reducing representational demands on senior staff.

Making editorial assistance, particularly for English language papers, readily available to Project scientists could increase the speed with which project findings are prepared for publication and also reduce demands on senior staff to provide editorial services.

PART II. FSR PROJECT LINKAGES WITH ACTION AGENCIES

D. CONCEPTUAL APPROACH TO FSR PROJECT LINKAGES WITH ACTION AGENCIES

The conventional model of agricultural research, as represented, for example, by the U.S. Land Grant system, is that of university based scientists developing new technologies in their laboratories and experiment station plots. These technologies are then extended to the farmers by agents of the cooperative extension service. In this model, the appropriate role for university scientists is to concentrate their efforts on technology generation.

Development of new technologies is certainly an important task for scientists at KKU. Use of the farming systems research approach to ensure that the technology being developed actually fits the needs of the farmers can greatly increase the returns on such work as it is now beginning to do at KKU. It is expected that much of the effort of FSR Project scientists, particularly those involved in component research (e.g., animal and plant breeding), will continue to focus on generation of new technologies for subsequent extension to the farmers.

FSR Project scientists have gradually begun to recognize, however, that the conventional agricultural research and extension model is not a wholly adequate one to meet the special requirements of rural development in rainfed areas of the Northeast. Despite heavy expenditures of staff time, effort, and funds over the past decade, relatively little technology has been developed that has been widely adopted by rainfed farmers. In the face of this problem, many FSR Project scientists have come to believe that an alternative approach

is required. They have begun experimenting with innovative new ways to bring the scientific resources of the university to bear on applied development activities. In particular, they have begun to articulate a new role for the university in providing assistance to government action agencies charged with responsibility for most development activities in the Northeast.

Instead of concentrating all of its limited research resources on generating new technologies for extension to the farmers, the FSR Project is beginning to shift its focus to development of new "leverage methodologies" which can be used by action agencies to develop and extend new technologies to the farmers.

This concept of focusing project effort on development of new methodologies derives from recognition of the fact that the university is not the appropriate institution either to develop new technologies on a large-scale or to take responsibility for their direct extension to the farmers. Concentrating Project efforts on developing leverage methodologies is a radical departure from conventional approaches to agricultural research and extension, including earlier efforts at KKU. It reflects an increased understanding on the part of Project scientists both of the capabilities and limitations of KKU as a development research institution and the special agroecological conditions characterizing Northeastern Thailand.

Although Khon Kaen University is increasingly being recognized as the leading institution engaged in rural research in the Northeast, it is important to also recognize the very real limitations on its capabilities in comparison to the magnitude of the problems it is being asked to help solve. It is a relatively new institution,

lacking the traditions of academic and scientific excellence of some of the older metropolitan universities. Many of its staff are also young, inexperienced, and yet to achieve full professional qualifications (only one social scientist involved in the FSR Project has a Ph.D., for example). The primary task of academic staff is teaching and the time available for research is correspondingly limited. All of these general constraints also apply to the specific case of the FSR Project, although it is fortunate in having an unusually high concentration of senior, highly qualified researchers associated with it. It is important, however, in assessing its activities to look at the Project in comparison to the total context in which it must work. When the FSR Project is viewed in this context it is evident that the U.S. Land Grant model for university participation in rural development in which university-based researchers (1) develop new technology and then (2) extend it to the farmers is in large part inapplicable to the situation of KKU.

(1) Technology development. The Northeastern Region for which KKU has assumed responsibility covers one-third of the surface area of the Kingdom. It has an area of approximately 170,000 km^2. If their efforts were to be spread equally across this surface, each of the approximately 50 researchers on the FSR team would have to cover several thousand square kilometers. Of course, interdisciplinary farming systems research does not work that way and in fact only one or at most a few FSR research teams are available to cover the region as a whole.

Not only is the total area vast, but the Northeast Region is characterized by an unusually high degree of environmental diversity.

The extent of this diversity is well documented at the macro and meso levels of agroecosystem analysis in the KKU-Ford 1982 workshop report. More recently, field work as part of the peanuts after rice testing has revealed that micro level variation is equally pronounced. Use of the same planting technology produced markedly different results in fields separated by only a few meters distance. The existence of such great environmental diversity markedly limits the possibilities of technology development by a centralized research institution such as KKU. Researchers there can not have an adequate knowledge of the multitude of distinctive environments in which farmers must actually employ their new technologies. This constraint on centralized agricultural research institutions has already been clearly demonstrated by the experience of IRRI. Improved rice varieties developed at Los Banos have diffused rapidly through the essentially ecologically homogeneous hydraulic core areas of Southeast Asia, e.g., Central Luzon or the Mekong Delta of Viet-Nam, but have not enjoyed similar success in the ecologically diverse hinterlands, e.g., The cordillera zone of Luzon or the Khorat plateau.

Given the great size and environmental diversity of the Northeast, to expect the small group of researchers involved in the FSR Project to develop new technologies that will have a significant impact on more than a very small percentage of Northeastern farmers is wholly unrealistic. To evaluate the FSR Project in terms of its success in generating such technology is to guarantee that it be considered a failure.

(2) Extension to farmers. Even if the university were in the position to successfully develop new technologies, it does not have

the necessary capability to engage in their direct extension to the farmers. There are approximately 2 million farm households in the Northeast, for a ratio of one FSR Project scientist to 40,000 farm households. No further comment on the feasibility of direct university to farmer extension services on a significant scale seems required.

There is also the alternative of the university focusing its attention on transmitting new technologies to the agents (kaset tambon) of the Department of Agricultural Extension who in turn extend the technology to the farmers. Such a "training of trainers" concept has, in fact, been employed to some extent by the FSR Project, as in the case of the peanuts after rice experiment. Such efforts are best viewed, however, as experiments to test new methodologies and not as prototypes for a continuing operational role for KKU in the training of kaset tambons. Again, the major constraint is the small number of FSR Project staff in comparison to the large size of the target audience. If the ideal DOAE ratio of one kaset tambon per 1,000 farm households is achieved, there would be 2,000 kaset tambons in the Northeast or 40 kaset tambons for each FSR Project researcher.

Conclusions regarding the conceptual approach employed by the FSR Project for its linkages with action agencies

Drawing on their growing understanding of rural development in the Northeast, particularly the results of detailed agroecosystems analysis, the FSR Project staff have recognized that they can not realistically engage in large scale direct interventions at the farm level either by developing or extending new technologies. Instead,

the limited resources of KKU can be most effectively utilized in (1) developing new methodologies for generating technology suitable to the Northeastern rural environment and (2) developing new methodologies for extending new technologies to the farmers. After developing and testing these new methodologies, KKU introduces them to the action agencies (e.g., the Department of Agricultural Extension) which bear formal responsibility for rural development. Continuing large scale development of technology and its extension to the farmers is seen as the task of these agencies and not of the university. The KKU role is to continue generating new methodologies which can then be adopted for use by the action agencies. By focusing the FSR Project on developing methodologies of this sort, rather than on direct development and extension of new technology to the farmers, the FSR Project is able to have an impact greatly disproportionate to its own size and strength, hence the term "leverage methodologies."

Recommendations regarding conceptual approaches to Project linkages with action agencies

The evaluation team supports the concept of the KKU FSR Project focusing its efforts on development of leverage methodologies. We see this new concept as one of the most important products to have come out of the first two years of work by the Project. Because it is a new concept, the full implications of focusing the FSR Project on developing leverage methodologies have not yet been analyzed in detail. We recommend that the Project leaders give this question their immediate attention since it has major consequences for which component sub-projects should receive priority in future years. We

have reservations about the extent to which many of the component research activities currently carried out by the Project will actually contribute to methodology development. There is a need to reevaluate these activities to ensure that they are compatible with the new Project emphasis on development of leverage methodologies as a primary objective.

E. METHODOLOGIES EMPLOYED IN FSR PROJECT LINKAGES TO ACTION AGENCIES

The FSR Project began its formal linkage with the action agencies by organizing the testing of peanuts after rice technology in one village in cooperation with Khon Kaen Agricultural Extension Office. Ten farmers were selected to participate in the testing. In addition to the training programs given to them, two of the ten farmers accompanied project researchers on two trips to the Surin area, where peanut after rice had already been grown successfully for some years, to learn more of the technology as practiced by the farmers there. These trips increased the farmers' understanding of the interactions of cultural practices and the physical environment. As a consequence, they were able to adjust their cultural practices to suit their own environments. During the growing period, a field day was organized to demonstrate the feasibility of extending it to other areas with Similar conditions. The field day was attended by researchers, extension agents and interested farmers.

After the successful testing of the technology in one village, a multilocational testing program was launched in collaboration with the DOAE for the 1984/85 cropping season. As mentioned elsewhere, one Subject Matter Specialist (SMS) of the DOAE worked closely with the

Project in this program. The detailed procedure for the testing was developed jointly by the SMS and the Project's researchers. It began with the identification by the participating Kaset Tambons of areas appearing to have generally suitable environmental conditions for growing peanuts after rice. The Kaset Tambons were then trained in using the area analysis methodology after which they applied this method to select suitable farms for field experimentation with the new technology. Training in use of the technology was then given to the participating farmers. The SMS and FSR researcher made scheduled field visits throughout the growing season. Finally, the testing program was evaluated for its agronomic feasibility, economic viability and social acceptability. Eight tambons were involved in this testing phase.

Using a very similar procedure, the Project has also worked with the DOAE and the DOA in the cassava replacement program. Three crops (upland rice, kenaf and field corn) were tested in five Amphoes for 1985/86 season. In addition, the Project is also cooperating with the Khon Kaen Agricultural Extension Office in the testing of sesame before rice in four Amphoes.

Besides the testing programs, the Project has also organized a farming system research training program for the personnel of the Farming Systems Research Institute (FSRI) of the DOA. This program is designed to introduce area analysis methodology to FSRI. To what extent, if any, the Project can have an impact on the FSRI is not certain at this stage.

Conclusions regarding methodologies

Although the FSR Project now aims at developing methodologies to be used by action agencies for generating and disseminating new technologies to the farmers, many of its activities may not necessarily contribute to this end. The development of methodology and technology are two different things. However, the development of methodology may also involve development of technology. Unless it is clear which is which the FSR Project will keep pursuing technology development under the illusion that it is developing methodologies.

Peanuts after rice, for example, can be considered as technology development as well as a tool for the development of methodology for generating new technology. As it has evolved in the project, however, it is more of technology development than methodology. The basic concept is not new. It is an introduction of an existing technology used in one area to new areas with very similar environments. Its success depends on the good understanding of the interactions of the environment and management practices. The FSR project achieves this understanding by learning from farmers' experience. Unless the method of how to do this learning from the farmers is clarified, and then translated into simple guidelines usable by the kaset tambons, so that it can be adopted for regular use by action agencies, the results of the project do not constitute the development of methodology.

The linkage between the FSR and the DOAE in the multilocation testing of peanuts after rice and its involvement with DOAE and DOA in the cassava replacement program are clearly an effort to develop the methodology for disseminating new technology. The requirement for the SMS to work closely with the researchers of the project ensures that

the SMS has a thorough understanding of the interactions of the technology and its environment in systems perspective. The SMS will then be able to train others to use the new method with confidence. However, its replicability depends to a great extent on the structural and institutional factors of the action organizations involved. Unless the FSR project is able to change the perception of the people in those organizations, its replicability is questionable.

Recommendations regarding methodologies for Project linkages with action agencies

The evaluation team recommends that the Project scientists pay greater attention to the distinction between development of methodology and development of technology. In present activities, such as peanut after rice testing, it is not always clear which objective has top priority. In this case, it is the method employed by the team to learn from the farmers and then to do area analysis of new locations for testing, that represent new methodologies, not the technology of growing peanuts after rice. If these methodologies are to be actually adopted by action agencies on a large scale, much more work is required to make them understandable and usable by extension staff of relatively low educational background and working without access to direct advice from KKU scientists.

F. INSTITUTIONAL ASPECTS OF FSR PROJECT LINKAGES WITH ACTION AGENCIES

Linkages with the action agencies (the DOAE and the DOA-FSRI) at present provide the avenues for the Project to test the validity of its experimental technology on a wider scale as well as to ascertain

the applicability of the methodologies for developing and disseminating new technologies. However, there is no definite arrangement among the agencies involved as to what role KKU should play and to what extent a formal linkage is to be established. Resolving this issue requires both top level policy decisions and structural and institutional changes in the action agencies. Although there have been some discussions concerning this issue between the Project and the action agencies, it is hard to anticipate its outcome.

Given the present circumstances, it is better to look at what role the FSR Project can play in order to have more impact on those action agencies without weakening its research capability at the same time. For the multilocational testing of its developed technology, the Project could establish a regular contact with selected KT's without difficulty and its impact on KT's involved may be significant, but its ramification beyond the pilot area will be limited at best.

In the case of disseminating methodologies there are two approaches which the project can use. One is on-the-job training for action agency staff in conjunction with the testing of technology (e.g. peanut after rice) and another is a more formal training program either on an ad hoc or regular basis. Both require staff commitment although of different kinds and with differing results. While on the job training concentrates on the practical aspects, the formal training course could provide both the theory of and the practical basis for farming systems research and extension. The one-year graduate diploma course in FSR which the Project will launch later this year assisted by FAO is an effort to institutionalize its training efforts and to strengthen its linkages with action agencies.

With proper recruitment of students from DAO and DOAE, it could have considerable impact on action agencies. However, both on the job training and the formal training course will make an added demand on staff time, particularly senior staff, to the extent that it may jeopardize their research capability. Unless the students and trainees are required to work on systems research problems, so that their efforts can compensate for some of the lost time of the senior research staff, the training program may even weaken project research capability.

Conclusion regarding institutional aspects of Project linkages with action agencies

The KKU-FSR Project has taken a forward step in formalizing its linkage with the DOAE through its multilocational testing program. Under this program, the Project can work with selected KT's and SMS's from the Khon Kaen Agricultural Extension Office. One SMS of the DOAE Bangkok office also worked in this program to learn not only the technology itself but the methodology of disseminating new technology and the linkage between research and extension. The procedure has been developed for the multilocational testing and can be modified to suit specific circumstances. This multilocational testing is also a training ground for the KT's and SMS's. In addition, the FSR Project has organized training programs on an ad-hoc basis for the action agencies. Now a regular one-year graduate diploma program has been institutionalized in the university curriculum and will be open in June 1986 for the students from DOA and DOAE. This formal course will strengthen the Project's linkages with action agencies even more if

students from agencies other than DOA and DOAE can also enroll in the course. However, the training program will inevitably take time and effort of the research staff away from project research activities. Unless research and training programs are complementary, the emphasis on training will eventually weaken research.

Recommendations regarding institutional aspects of Project linkages to action agencies

It is recommended that 1) the Project confine its involvement in ad-hoc training programs to only those action agencies which are willing to assume substantial responsibility for preparation of these programs thus reducing the demand that these programs place on research staff time. 2) Students in the one year graduate diploma program should be required to work on pre-defined research problems to help make up for the lost time of the research staff. 3) To provide incentive to students capable of working toward MS degree level, the Project should consider the possibility of improving the diploma curriculum, to be in line with other graduate programs, which will permit the diploma students to further their studies. Such development would also enhance the research capability of the Project. 4) In order to release the senior researchers from administrative duties which take them away from their research activities, administration of the training and diploma programs might be turned over in the future to the KKU Extension Department.

PART III. INFLUENCE OF THE FSR PROJECT ON KKU GRADUATE QUALITY

G. THE TEACHING OF RURAL SYSTEMS CONCEPTS AT KKU

About one hundred undergraduate students are enrolled in plant science and animal science every year. Six graduate students are admitted for Master's degree study in animal science, and about 12 in plant science. Social science does not offer a graduate degree.

All graduate students in plant science are required to take the course on "Cropping Systems" (Plant Science 114711), in which system concepts and analysis are emphasized. This course is the responsibility of an agronomist with the cooperation of supplementary teaching staff from economics, social science, and agricultural extension. The course on "Livestock and Aquaculture Production in Integrated Farming Systems" is also required for all graduate students in animal science (Animal Science 117700).

Besides the two courses directly dealing with system concepts as described above, there are many undergraduate courses on crops and livestock in which system concepts and farming system perspectives have been incorporated into different parts of lectures in each course. These courses, such as field crop production, poultry production, beef and buffalo production, and swine production, are good examples of the ways in which farming system concepts and village information derived from the activities of the FSR Project have been integrated into teaching at KKU.

Information obtained from FSR Project research is also used in some lectures in the "Introductory Social Science" course offered for at least one hundred and fifty students per year by a sociology

lecturer who has been actively involved in these activities. Mr. Pongcharn, who has been teaching the course on "Animal Behavior", also has incorporated information and experiences he obtained through actively taking part in the FSR Project in this course. The course is offered every year and about 300 students attend, not only students in the Faculty of Agriculture but also from other faculties.

Conclusions regarding teaching of systems concepts at KKU

Since the FSR Project has been going on only for two years its impact on the quality of undergraduate students can not yet be directly assessed. Instead, it is only possible to observe the considerable extent to which Project findings are being incorporated into lectures in various courses. This suggests that in the longer run systems concepts will be more and more accepted into a wide range of subjects, and undergraduate students in many faculties at KKU will be exposed to system concepts and thinking.

A major impact of the FSR concepts and guidelines can be seen more clearly among graduate students, some of whom are government officers on leave for study. At least half of the graduate students in both plant science and animal science have been exposed to village farming systems and problems prior to development of their thesis topics and outlines. Those who have been exposed to real village farm situations and FSR reading materials can better fit their thesis problems and findings with the small farm system. These future graduates, who are government officers, upon completion of their degree and return to their duties, will be more able to plan and implement their responsible projects or programs to solve small farm problems.

H. METHODS FOR TEACHING RURAL SYSTEMS CONCEPTS AT KKU

Several different methods are simultaneously employed in conveying FSR concepts to graduate students, besides direct teaching in formal courses as mentioned earlier. At least half of M.S. thesis problems have been planned within the framework of farming system perspectives, although many of them dealt with commodity or disciplinary research.

Some graduate students also serve as research assistants or project trainees. They gain a great deal of real understanding of small farm problems by being exposed to project activities and village conditions. Some graduate students also have had chances to present and discuss problems related to FSR in the graduate student seminar. They were also required to attend national or international workshops or seminars related to FSR whenever these were held in Khon Kaen, and these graduate students were required to report such seminar or workshop results to a staff/student seminar. Students were also given chances to go on field trips or farm visits to observe some existing farmer technologies. And whenever farmer-to-farmer extension activities were organized by the FSR Project some students had good chances to learn a great deal about farming practices. It was found that transfer of understanding of the FSR concepts from students-to-students also plays a major role in student learning. Numerous FSR reports and information are made readily available for student reading in Department and Faculty libraries. A bi-monthly bulletin called "Farm News" has been issued during the past two years to disseminate information about village farming systems and other system concepts to wide-range of readers, including students.

Conclusions regarding methods for teaching rural systems concepts

It is evident that many different methods have been used by the FSR staff to convey system concepts and village farm conditions to students. It is clear that students at KKU, especially graduate students, will have even more opportunity to be exposed to system concepts and thinking in the future.

Recommendations regarding methods for teaching rural systems concepts

It is recommended that M.S. theses should be oriented more directly toward the study of methodologies in the FSR frameworks, and that interdisciplinary advisory committees be used to guide students.

When revision of outlines for crop or animal production courses occurs, the existing FSR information or concepts should be incorporated in these courses.

I. INSTITUTIONAL ASPECTS AFFECTING GRADUATE QUALITY

The undergraduate curricula of the Faculty of Agriculture was last revised in 1984, when the FSR Project had just begun to operate. The revision of curriculum usually takes place every 3 or 4 years. No curriculum revision has been made since the beginning of the FSR Project.

The Faculty of Agriculture has informally recognized the FSR Project as the master research project of the Faculty. In the long run, it can be expected that the FSR concepts and information will be accepted into the planning of certain curricula such as that in plant science and animal science.

As far as teaching quality is concerned, some opinions were expressed concerning the existence of a certain degree of conflict between the FSR activities and teaching quality of certain staff members. However, the evaluation team feels that this conflict is not very serious at this point.

Recommendations

In the long run, in order to reduce the routine work load of the teaching staff participating actively in the FSR activities, additional research supportive staff should be provided through the RDI to assist in certain project activities so that the teaching staff could allow more time for teaching. Ideally at least one research assistant with a Master's degree and one diploma-level research should be provided to each research section to assist the core team leader at this stage of the Project. More supportive staff will be required as the Project activities increase. With this research support the core staff should be better able to cope with their teaching responsibilities.

PART IV. DEVELOPING A SUSTAINABLE RURAL SYSTEMS RESEARCH CAPABILITY AT KHON KAEN UNIVERSITY

J. SYSTEMS CONCEPTS IN RELATION TO LONG-TERM DEVELOPMENT OF KKU RURAL RESEARCH CAPABILITY

The real measure of whether or not the FSR project has contributed to the development of long-term institutional capability at KKU to conduct interdisciplinary systems-oriented rural development research is the degree to which university staff have incorporated this conceptual approach into their thinking. Is the systems approach simply another in a long line of foreign imports into the Thai academic warehouse, there to be pulled out for the inspection of farang visitors, but not really used in the day to day work of Thai scientists, or have at least some KKU staff actually become committed to employing and further developing this conceptual approach in the course of their own future work? Are we dealing with a short-lived intellectual fad which will fade away as soon as foreign donors shift their emphasis to the next magic solution to rural development (the bloom on FSR &D already appears to be fading in donor circles) or are we looking at the still chaotic beginnings of an important new research capability?

Answering these questions is difficult because they involve assessment of qualitative changes in peoples' thinking, which are not necessarily faithfully reflected in what they are currently saying or doing. Most scientists are to some extent chameleons, able to change outward color to seem in keeping with current intellectual trends. So simply counting the number of reports claiming to employ a systems perspective on rural development, or asking researchers whether or not

they are doing agroecosystem analysis or farming systems research, will not provide valid measures. Repeated in-depth informal conversations with KKU scientists offer one basis for our assessment. Looking at choices about their allocation of time and effort, particulary choices affecting possible future career paths, has also been useful. We can presume that a scientist who chooses to spend time on systems related work instead of concentrating on disciplinary activities (assuming both alternatives are open to him) is indicating some sort of real commitment to the former.

Our discussions with project scientists have convinced us that some very real and significant changes have occurred in the thinking of at least some of them. A senior agronomist, for example, expressed his desire to have social scientists work together with soil and crop scientists in a study of using fertilizer to increase rice yields. He wants the soil specialists to study the feasibility of applying fertilizer only after the farmers are sure that the crop will be successful since he now recognizes that Northeastern farmers are unwilling to employ cash inputs in high risk situations. He also wants social scientists to analyze whether the farmers will employ fertilizer on rice even if it is risk free since this involves cash inputs into production of what is basically a subsistence crop. He further suggests that it may be necessary to show the farmers that by increasing rice yields on their lower paddy fields they can free land in their upper paddys for growing of high value cash crops. The study proposed by this agronomist represents a rather remarkable synthesis influenced by human ecology, agroecosystems analysis and farming systems research concepts.

These are:

> **Human ecology:** Glutinous rice is a culturally valued "super food" of most rural Northeasterners. Growing enough glutinous rice to meet familly consumption needs is the primary objective of farmers and determines their decisions about land-use.
>
> **Agroecosystems analysis:** Glutinous rice is grown in both lower and upper paddys. Production in the lower paddys has very high stability, that in the upper paddies is very unstable. Productivity in both types of paddy field is quite low due in part to poor soil fertility.
>
> **Farming systems research:** Appropriate use of fertilizers may be a feasible technology for increasing rice productivity. Because it represents a cash input farmers may refuse to use it unless the risk of crop failure is reduced. A key question for FSR is whether it is possible to develop techniques for applying fertilizer only after the farmers are sure the crop will be successful. Even if risks can be reduced, farmers may still be unwilling to employ a cash input into a subsistence crop. A second question, therefore, for FSR is whether increasing productivity of the lower paddys can free enough higher land for growing of cash crops to make up for the additional input costs.

The ability of senior KKU scientists to effectively employ systems concepts in the above manner represents a major result of their involvement in the FSR Project and the Ford Foundation supported projects which preceeded it. The existence of systems thinking of such high caliber on the part of a few researchers does not, however, provide a valid indicator of the extent to which the majority of project staff have internalized systems concepts into their worldviews.

On paper, involvement of KKU staff in rural development research employing a systems perspective is high. Researchers currently listed as participating in the FSR Project include 17 crop scientists, 14 social scientists, and 3 animal scientists. In addition there are 12

research assistants working in the various project sections. In total some fifty researchers are involved in the project to some degree, which makes it one of the largest interdisciplinary rural systems groups working in Asia, if not the entire developing world.

Conclusions regarding systems concepts in relation to KKU rural research capability

It is the considered view of the evaluation team that, while many KKU staff now employ systems concepts to some extent in their research, the average level of understanding of the systems perspective is quite shallow, and only a minority of project staff have any real intellectual commitment to this conceptual approach. A generous estimate of staff who have genuinely internalized the systems approach would be ten, and a more realistic number may be no more than five or six.

That even half-a-dozen staff have changed their thinking as much as they have in such a short time represents a major success of the FSR Project. It suggests, however, that a certain degree of doubt about the long term sustainability of the system approach to rural development research at KKU is in order. Loss of even one of its senior leaders would hurt the future development of the project; if two or three should leave the university, it is doubtful that the systems approach would remain viable.

Recommendations regarding systems concepts in relation to KKU rural research capability

Finding ways to deepen the understanding of systems concepts by a larger number of KKU staff should be an important priority for future work by the FSR Project.

K. METHODOLOGIES FOR DEVELOPING AND SUSTAINING KHON KAEN UNIVERSITY INSTITUTIONAL CAPABILITY FOR DOING RURAL SYSTEMS RESEARCH

Developing and sustaining institutional capabilities for doing systems research on rural development at KKU depend both upon: (1) increasing staff competence to do such research and (2) enhancing the university's external reputation as a center of excellence for rural systems research. Increasing staff ability to do high quality rural systems research is the first priority.

1. Increasing staff systems research capabilities.

Provision of opportunities for staff training in systems research is the most important method used for increasing staff competence. Such training is provided both in-house and outside of KKU. The FSR Project (and the Cropping Systems Project which preceded it) places considerable emphasis on provision of training opportunities. Staff seminars, workshops, and field exercises are all employed.

Beginning in 1981, the East-West Environment and Policy Institute (EAP), working in collaboration with the institutions that later formed SUAN, organized a series of short workshops to introduce human ecology concepts and research methods to scientists at regional universities such as KKU. At least 20 KKU staff, including the majority of the current leaders of the FSR Project, have participated in one or more of these workshops. Following the final workshop, which was held at KKU in April 1983, Dr. Terry Grandstaff, resident consultant for the Ford Project, organized a one semester staff seminar on interdisciplinary rural research. This seminar was followed by intensive training in the use of Rapid Rural Appraisal

techniques and the application of RRA to a series of studies in support of the FSR Project. RDI also offers training workshops, particularly aimed at social scientists, on methods applicable to rural research problems.

A number of KKU staff who have participated in the FSR Project have also been given the opportunity to pursue graduate degree studies abroad. One social scientist is currently completing his doctoral dissertation in anthropology at the University of Washington and an agronomist will enroll in the doctoral program at the University of the Philippines at Los Baños this year. Both are supported by the Ford III grant. No USAID funds are available for support of advanced degree training for FSR Project staff.

Although KKU has been quite successful in providing short term (e.g., workshops and seminars) and long term (graduate degree fellowships) training opportunities for FSR Project staff, much less has been done to offer intermediate levels of training designed to allow senior staff to enhance their systems research capabilities. Several staff have had internships at the East-West Center but these are relatively short-term, from six weeks to two months in length. No provision exists for longer term post-graduate professional study, e.g., fellowships to allow senior staff to spend six months to one year working at leading foreign institutions focusing on rural systems research.

Developing and maintaining staff systems research capability is also dependent upon creation of a milieu within KKU that encourages continued participation in such research. Especially important is ensuring that staff keep up with new developments occurring elsewhere

in the world. This requires access to both current scientific literature and the opportunity for direct personal contact with rural systems researchers working at other institutions, both in Thailand and elsewhere.

Library facilities at KKU are not well developed. Few international journals in which papers on human ecology and agroecosystems research are regularly published are available. As part of a new Ford Foundation grant to the East-West Center to help support development of agroecosystem research in Southeast Asia, a Cooperative Information Support Service is being tested out with the FSR Project. This service is intended to provide current bibliographic information on new publications relating to human ecology and agroecosystems analysis to FSR Project staff who may obtain copies of any documents of interest from the EWC.

In view of the lack of emphasis in Thai academic circles on reading of current literature as a method for developing and maintaining professional competence, provision of frequent opportunities for face to face interaction with leading researchers from other institutions involved in rural systems research has special importance. KKU has an excellent record in this regard with the FSR Project having done a great deal to promote information exchanges with researchers at other Thai, Southeast Asian, and international institutions.

FSR Project staff maintain especially close professional relations with counterparts at the Multiple Cropping Project at Chiang Mai University and considerable informal exchange of information occurs between the two groups. The Project also participates in the

Thai National Farming Systems Research Network, the annual meetings of which provide the opportunity for exchange of information between university and government agency (e.g. the FSRI) researchers.

The Project is also involved to varying degrees in information exchanges with a number of regional and international institutions and networks, including IRRI, ICRISAT, and the USAID-funded Farming Systems Support Project (FSSP) at the University of Florida. Recently, FSSP invited Dr. Terd Charoenwatana, FSR Project Director, to serve as the Asian Regional Advisor to its Technical Committee.

The Project's most active external linkage is with the Southeast Asian Universities Agroecosystem Network (SUAN). This network, which was formally established in mid-1982, involves interdisciplinary rural resource management research groups at regional universities and institutes in China, Indonesia, the Philippines, and Thailand. KKU, first through the Cropping Systems Project and now through the Farming Systems Project, is a permanent member of the network's steering committee.

SUAN works in close collaboration with the East-West Environment and Policy Institute (EAPI) to increase opportunities for exchange of information between participating projects and to design and implement collaborative research projects intended to advance understanding of concepts and methods for agroecosystem research. The network and EAPI jointly sponsor a continuing series of scientific conferences on agroecosystem research (held approximately every 18 months) at which scientists from member institutions present papers giving their latest research findings. Several FSR Project scientists have attended earlier meetings, the next of which is to be held at Chiang Mai

University in November, 1986. Selected papers are published in the proceedings of these symposia which also helps to make the work being done at KKU known to a wider audience.

SUAN is currently engaged in the network's first collaborative research project. Member groups, including the FSR Project, have agreed to write comparative case studies of village-level agroecosystems. All of the case studies will employ a common analytic framework focusing on system organization and emergent properties. This framework was developed at an Agroecosystem Analysis Workshop held at KKU under cosponsorship of the FSR Project and EAPI, 6-10 January 1986. Four FSR Project staff are involved in preparing a case study on Ban Hin Laad, the FSR Project village. After assembling available data at Khon Kaen they will attend the Agroecosystem Case Study Writing Workshop to be held in Honolulu, 28 April-16 May 1986, where researchers from all of the SUAN groups will work together to prepare their case studies.

Writing of the agroecosystem case studies is intended as only the first step in a series of collaborative SUAN research activities involving KKU. The next step is to design and implement a field study on ecosystem interactions in which the interrelatinship between forest, farm, and aquatic components within a watershed area in Northeastern Thailand will be analyzed by senior scientists from several SUAN groups working together with staff of the FSR Project and the Ford III consultants. This activity will be initiated with a planning workshop in November 1986 followed by a field data collection effort in 1987. KKU scientists will have the opportunity to work together with senior specialists from other SUAN groups.

2. Enhancing the external reputation of KKU as a center of excellence for systems research.

Enhancement of KKU's institutional reputation as a center for excellence in rural systems research (which is a prerequisite for the ability to continue to attract external funding for the FSR Project) is dependent not only upon the doing of high quality research but also requires that the findings of these studies become widely known beyond the boundaries of the university itself. This is achieved by the participation of staff in national and international seminars and conferences, which has already been dealt with earlier in this report, and by the publication and dissemination of reports of project findings.

The Project has devoted considerable effort to dissemination of its findings within Thailand. A monthly newsletter, "FSR News" is published presenting information on current activities and preliminary research reports. Twenty-five copies have been published to date. A number of articles have been republished in other Thai journals such as the Buffalo Network Newsletter issued by Kasetsart University. Circulation is presently about 500. Final reports of most of the RRA studies have also been published (in Thai) and distributed widely within the national agricultural research community.

Much less attention has been paid to international publication. Several papers by FSR Project staff have been included in the proceedings of the first two SUAN-EAPI Regional Symposia on Agroecosystem Research, an RRA report on "trees in paddy fields" is to appear in a book on the human ecology of traditional Southeast Asian

agriculture to be published later this year by Westview Press, and a paper reviewing the conceptual approaches employed by the FSR Project is included in a volume on agricultural systems education that the University of Hawaii College of Tropical Agriculture is assembling for publication by Westview Press.

Conclusions regarding methods for developing and sustaining KKU institutional capabilities for doing rural systems research

The FSR Project has made a significant contribution to development of KKU's institutional capability for doing rural systems research. The Project, and the earlier Cropping Systems Project, have placed great emphasis on providing opportunities for staff to gain training in concepts and methods applicable to rural systems research. The major shortcoming with regard to training is the lack of opportunities for relatively senior staff to receive in depth post-graduate training in rural systems research. Unless such opportunities are provided, continued growth in their professional capabilities will be retarded and the long-term sustainability of systems research at KKU made more problematic.

The FSR Project has also done an excellent job of making its work known to the larger scientific and policy communities in Thailand and, to a lessor extent, internationally.

Recommendations regarding methods for developing and sustaining KKU institutional capabilities for doing rural systems research

The evaluation team recommends that Project funds be employed to support medium term post graduate training in rural systems research for senior Project scientists. At least one senior researcher from

each of the three sections should be provided with the opportunity to spend several months in residence at an appropriate foreign institution.

L. INSTITUTIONAL ASPECTS OF DEVELOPING KKU RURAL SYSTEMS RESEARCH CAPABILITY

The long term sustainability of KKU's capability to engage in interdisciplinary systems research on rural development in the Northeast is influenced by several institutional factors. These include (1) definition of the university's role, (2) the way in which research is organized within the university, (3) the nature of professional rewards to staff, (4) the prospects for long-term funding.

1. Definition of the university's role.

Considerable ambiguity exists regarding the role that Thai universities should play in the national development process. The Universities Act does not clearly specify the relative weight that universities should assign to the functions of teaching, research, and application. In the absence of clear direction from the central authorities, staff at KKU are having to make their own, essentially ad-hoc decisions about priorities. There is no concensus in this regard and differences in opinion are the source of some internal tension. The problem is most acute for the social scientists who are based in the Faculty of Humanities and Social Science. This faculty has traditionally seen itself as a service faculty for the rest of KKU with staff expected to wholly devote themselves to teaching. Even

within the Faculty of Agriculture, however, some staff perceive research to be in conflict with teaching. Certainly, the heavy demands made on the time of senior staff by the running of a large interdisciplinary project like the FSR Project greatly reduces the amount of attention given to preparation of lectures and face-to-face interaction with students. On the other hand, as was discussed in Part III, new experience gained by lecturers in the course of working in the FSR Project and new information generated by this project are making a positive contribution to increasing the quality and relevance of the courses taught by project staff.

A second issue relating to the definition of the role of the university is the nature of the relationship between KKU and various governmental action agencies bearing formal responsibility for design and implementation of development programs in the Northeast, particularly the various departments of the MOAC, whose applied research responsibilities frequently appear to overlap university research areas.

In principle, to enhance its teaching function, the university must undertake research to generate new knowledge in every area in which it grants a degree. In those area in which the responsible action agency lacks its own research capability, e.g., medicine, the university can take the lead in research. However, in the field of agriculture, both action agencies (DOA, DOAE) and the university have research capabilities. A potential for conflict of interest and duplication of effort exists if the areas of responsibility are not clearly delineated. Since there is no guideline or accepted principle regarding division of labor in agricultural research the university

always stakes a wide claim on the grounds that it has the research capability and it would be a waste to the country if such capacity was not utilized. Also, it argues that the university setting is best suited to a research endeavor having a long time horizon and interdisciplinary nature.

In the field of development, however, the university's capability cannot match that of the action agencies. What the university could do is to provide supporting services in the area which it has expertise to the extent that it will not jeopardize fulfillment of its other responsibilities. There is no conflict with the action agencies.

2. Organization of Rural Systems Research within KKU.

The FSR Project is formally a subcomponent of the Research and Development Institute (RDI). Because RDI was still in its establishment phase when the FSR Project was initiated it was agreed that the latter would function under its own essentially autonomous leadership with RDI only providing logistic and administrative support. This arrangement appears to have worked remarkably well with no serious friction marring the relationship of the FSR Project and its parent institute. However, this relationship may suffer strains if RDI moves away from its original role as KKU's research facilitator and coordinator toward undertaking active research itself. Since there is no clearcut division of responsibilities between the FSR Project and other research activities of RDI, research funded by RDI is not necessarily supportive of the work of the Project. As mentioned elsewhere, some of the RDI managed research grant to KKU's

researchers, although appearing to be complimentary, are in fact competitive with FSR. Unless RDI's research undertaking and funding which could impinge on FSR's research activities are really relevant within the FSR context, RDI could jeopardize the long term development of FSR Project as the institutional focus for rural systems research at KKU.

The somewhat ambiguous relationship which exists between the FSR Project and the different faculties also has implications for the effort's long term sustainability. Although it is by far the largest and most active interdisciplinary effort at KKU, involving staff from at least three different faculties, the FSR Project is perceived by many members of the university community as being dominated by the Faculty of Agriculture. The Project leaders, many of whom are in fact members of the Faculty of Agriculture, have gone to considerable lengths to take interests of staff from other faculties, particularly the social sciences, into account, but this does not fully solve the structural problem. There is a real contradiction between the stated project objective of developing interdisciplinary research capability for KKU as a whole and the organizational structure currently employed for the FSR Project.

3. Professional rewards to KKU staff for engaging in rural systems research.

If a strong capability to do interdisciplinary rural systems research is to be institionalized at KKU there will have to be sufficient professional rewards offered to attract and hold the involvement of top quality staff members. On the positive side, it

was found that many core FSR staff who have been actively engaged in Project activities have found strong incentives for them in working with this Project. These can be classified as academic, economic, and social incentives.

In term of academic advancement, many core researchers feel that they have gained a new dimension for their learning, research, and teaching activities from the FSR approach. For instance, the RRA technique has offered them a way to quickly obtain general information about farming systems. The use of farmer-to-farmer methodologies offers an excellent opportunity not only to try their new inventions but also to learn more about farmers and existing farmer technologies which could be further investigated and modified. These activities provide exciting and seemingly endless avenues for their academic advancement. And, as a result, publications including research and technical reports, teaching materials, professional papers, etc., have been produced in substantial numbers during the past two years by various FSR staff. Consequently, their technical contributions to the field of FSR have begun to be recognized nationally and internationally. The FSR Project also offers the KKU staff an opportunity to achieve academic excellence due to the early leadership established by KKU in this field in relation to other universities in Thailand.

In terms of economic incentives, it was found that the Project funds provided for researcher compensation and travel allowance are an important direct incentive. Many core staff received financial support, some from Project funds but mostly from sources outside the Project, to attend short-term training courses as well as national and

international seminars or workshops. Some core staff had chances to attend several international meetings a year. This can be viewed as a significant factor not only in terms of economic but also academic and social incentives.

The scientific quality of the KKU/FSR group has been recognized not only nationally but also internationally. Their accepted leadership in the area of FSR has provided good social morale for this group of researchers. Most of the FSR staff feel that they have better chances to work very closely with rural small farmers, who form the majority of Thailand's population and badly need help to upgrade their livelihood. This kind of feeling creates great pride in their work as well as a sense of belonging to their community, especially the Northeast. It is also evident that the FSR Project has already established certain linkages with action agencies such as DOAE, DOA, DLD, or local administration offices, which provide ways and means for research and technologies generated by the FSR to be put into effect. This creates a sense of satisfaction and pride on the part of FSR personnel regarding their contributions to society.

The evaluation team has also observed various disincentives for staff to participate in Project activities which have tended to limit the expansion of the FSR group. First, at the beginning of the Project it was difficult to give some administrators, particularly the heads of some departments, a full understanding of the meaning and operational frameworks of the FSR Project. It is still not clear whether every administrator fully understands and appreciates the FSR approach. In addition, there appears to be some skepticism on the part of some high level or national administrators regarding the value of the FSR approach to rural development.

Secondly, it was found that certain staff have not joined the FSR activities because they cannot fit their disciplinary research into the FSR framework. Many department staff are willing to spend time learning about farming systems, but are happier when doing conventional disciplinary research in laboratory or university experimental farm fields. Many highly advanced technologies cannot be applied to small farm conditions and many scientists view this as a limitation to developing their scientific skills which often are more suitable for advanced agriculture in developed countries.

Some staff members feel that to work in interdisciplinary research they have to spend some amount of time in talking to and understanding other personnel outside their own fields. Some highly trained staff members visualize significant roles for their own disciplines, but when working in the FSR framework, under actual farm conditions, find that these may not be so important to meeting the needs of the farmers. This tends to discourage the participation of such staff.

Thirdly, to keep scientists working as an interdisciplinary team, effective coordination and leadership are required. Coordination requires the time, attention, and patience of good team leaders. To the extent senior staff play this role effectively, the time they have available to pursue their personal research interests is reduced.

4. Prospects for long-term funding.

Rural systems research at KKU is almost entirely financed from extra-university sources, primarily by grants given by foreign donor agencies. Over the past ten years, the Ford Foundation, IDRC, USAID,

and CIDA, among others, have provided several million dollars to support development of rural research capability. Shortage of money is not, at present, a major constraint on research at KKU. In fact, it appears that any staff member capable of writing an even marginally adequate research proposal can obtain more funding than can be productively utilized. As we have noted earlier, having too much money chasing too few qualified scientists is a cause for concern in the present situation.

Long-term prospects are more uncertain. It does not appear likely that the regular university budget can provide internal research funding for FSR at anywhere near the level currently obtained from foreign donors. Thus, maintenance of rural systems research capability is contingent on obtaining continuing long-term special funding from both Thai government and foreign donor sources.

Given the special situation of the Northeast it is likely that foreign donors will continue offering research funds to KKU. Such funding, however, is generally specifically to do research on problems considered to be important by the donors and not the problems that KKU scientists have identified as most significant.

Conclusions regarding institutional aspects

The institutional setting for developing and maintaining long term capability for rural systems research at KKU is far from ideal. As a relatively young regional university which is located in the center of the poorest region of the Kingdom, KKU is still struggling with defining a role for itself in the regional development process that is compatible with its academic mandate.

The conflict between staff who assert that teaching is the primary function of professors and those who would give greater priority to research is one symptom of this larger problem. In this case, it needs to be recognized that KKU is not a specialized research institute and staff can not expect to spend fulltime on research to the exclusion of teaching; at the same time, engagement of staff in research can make a real contribution to improving the quality of teaching at KKU. The FSR Project has already had considerable impact in this regard but there is still much room for improvement in the university as a whole.

The extent to which KKU can or should be involved in development activities is an even more difficult question to answer, particularly in the absence of clear definition by the government of the kind of relationships the universities should have with action agencies. If the concept of university researchers focusing on developing leverage methodologies, rather than trying to engage directly in development activities, is accepted then stronger linkages with the action agencies who are expected to adopt these new methodologies will be required.

Creation of an appropriate organizational structure for rural systems research represents a continuing problem at KKU. The present somewhat ambiguous relationship between the FSR Project and the Research and Development Institute is an artifact of the historical situation at the time the Project was established, not a rationalized plan for the future. The relationship between the FSR Project and the different faculties also reflects the situation within KKU at the time the Project was organized. At that time, the greater strength and

experience of the Faculty of Agriculture made it the logical source of leadership. The situation is changing, however, and it may be time to start thinking about revising the organizational structure of the Project.

The FSR Project is characterized by extremely high staff morale. Scientists participating in its activities express considerable personal satisfaction about the nature of their involvement. There also appears to be considerable realism in their assessment of the costs and benefits of their participation in the Project.

Obtaining long-term funding to sustain the development of rural systems research capability at KKU is a major concern. Given the interests of a variety of foreign donor agencies in rural development in the Northeast, we do not expect that KKU will face great difficulty in attracting external research funding in the future. The nature of this funding is likely to be more of a problem, however. Donor agencies have their own priorities which all too often reflect current fads rather than the results of systemic analysis of rural development problems. What is needed, however, is support for the kinds of research that scientists at KKU have themselves identified as significant. Unless substantial untied funding to support basic rural systems research is available the prospect fo KKU becoming a sort of Northeastern Thai "beltway bandit" contract research operation is not wholly improbable.

Recommendations

Most of the problems discussed in this section are ones that must be worked out by Khon Kaen University staff themselves and are not

matters where the evaluation team believes it should make specific recommendations. As outsiders we lack the detailed knowledge of specific local conditions, especially the role played by interpersonal relationships, that is necessary in order to determine which institutional solutions are appropriate and acceptable at KKU. Our major suggestion, therefore, is that KKU staff, not just those in the FSR Project, but key figures outside of the project as well, begin to pay more attention to questions affecting the long-term sustainability of rural systems research capability at KKU. The FSR Project represents an extremely promising beginning; now it is time to give more thought to what KKU as an institution can and should do to facilitate its continued evolution.

The evaluation team also suggests that careful consideration should be given to the organizational structure for interdisciplinary rural systems research at KKU. The fact that the FSR Project is a genuine interdisciplinary effort and not a wholly owned subsidiary of the Faculty of Agriculture needs to be given institutional recognition. The desirability of designating the Project as a university-wide activity set above any individual faculty in the KKU management hierarchy should be explored. We are not suggesting, however, that there is a need for any radical change in the existing management structure within the Project. The present arrangement of having an interdisciplinary core group coordinate research under the supervision of the Project advisory committee appears to be quite effective.

Obtaining long-term funding to support development of rural systems research capability at KKU is seen as extremely important by

the evaluation team. A number of international donor agencies, including USAID, are to be commended for having had the foresight and courage to invest major grant funds in attempting to develop a new kind of rural systems research capability at KKU. No readymade models for developing such a capability existed elsewhere and the risk of failure was high. The performance to date of the FSR Project has more than justified initial expectations. The key question for the future, however, is whether the Thai government and the donor agencies will be willing to continue providing the kinds and levels of support that are needed to maintain and further develop a first rate rural systems research capability at KKU?

We have no doubts that KKU will be able to attract major outside financial support for rural research projects in future years. Our concern is that these funds will be tied to doing research to solve problems indentified as significant by the donors and not those emerging out of the research experience of KKU staff themselves. The present USAID grant has achieved the results it has largely because it did not try to dictate research directions in advance. Instead, within the general framework of farming systems research, it provided Project scientists with a great deal of freedom to choose what they considered to be the most rewarding directions to follow in their research. The gradual emergence of Project concern with generation of "leverage methodologies" is an example of a very promising new research direction that was not envisaged in the original project design.

The evaluation team recommends that USAID and the Thai government jointly explore ways to provide the long-term core funding needed to

ensure the continued development of rural systems research capability at Khon Kaen University. We fully concur with the recent statement by the New Zealand geographer, John McKinnon, that

> it is in Khon Kaen that "good" rather than "competitive science" is being fostered for rural development. In the long run what will be achieved is more likely to earn international acclaim than much of what is being attempted in Bangkok, (Pacific Viewpoint, vol. 26, 1985, p. 583).

The key words that should be underlined in McKinnon's comment are "in the long run": systems research capability can not be developed quickly or cheaply. The FSR Project has made considerable progress in a remarkably short time but a much longer period than is allowed for by the present grant will be required to consolidate it into an enduring KKU institutional capability to do high quality systems research in support of rural development in Northeastern Thailand.

APPENDIX A: SCOPE OF WORK

KKU/USAID

FARMING SYSTEMS RESEARCH SUB-PROJECT

KHON KAEN UNIVERSITY RESEARCH DEVELOPMENT PROJECT

PROJECT NO. 493-0322

MID-TERM EVALUATION

EVALUATION SCOPE OF WORK

I. Activity to be Evaluated

This evaluation is scheduled to look specifically at the Farming System Research Sub-Project component of the Khon Kaen University Research Development Project, A.I.D. Project No. 493-0332. The total project cost is $2.0 million. The project provides 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. More specifically, the project finances research activities, technical assistance, training, workshops, operating expenses and evaluations. The Project Assistance Completion Date (PACD) is June 30, 1989.

The other Research components of the project were evaluated in January 1985 as part of a Management Analysis which assessed the project's operating and administrative procedures.

II. Purpose of the Evaluation

The overall purpose of this mid-term evaluation is to examine in detail the approach the project is taking toward meeting project objectives in strengthening the institutional capacity of KKU to conduct research appropriate to Northeast rural communities and make recommendations to the project as to what aspects seem worthwhile continuing as is and where emphasis might be changed in order to better realize project objectives. In particular, the evaluation team should examine three levels of project approach and activities. The "product" level, the methodological and organizational level, and the institutional level. At each level, the aim is to assess how the project is using or could use concepts, methodologies, procedures and activities to achieve project objectives. The results of this evaluation are expected to be used by all agencies involved in the Farming System Research in Thailand. The immediate users of the findings and recommendations will be the KKU Farming System Research Working Group.

The internal logic of the FSR Project is designed to support directly this overall goal of the KKU-USAID grant project. The FSR Project itself has four principal objectives, or purposes, concerning the application of the farming systems approach to the livelihood problems of Northeast Thailand's rural communities. These are:

(1) To develop, test and disseminate farming technologies and define the type of farm system and environment where each will be suitable and beneficial.

(2) To derive and disseminate information on agroecosystems and farming systems and their environments, and in terms of the types of problems and opportunities they have and how they allow or constrain various types of technological solutions.

(3) To develop, test and disseminate methodologies for doing (1) and (2) and put these in a form that can be used by action agencies and applied in the field. Additionally, steps will be taken to ensure coordination between MOAC and KKU.

(4) To promote training and communication with action agencies so that (1), (2) and (3) get widely applied in Northeast Thailand, and throughout the country.

This evaluation is scheduled according to the evaluation plan approved by USAID to be taking place in early FY 86.

III. Background

The Farming System Research Sub-project began work in FY 84 and will terminate at the end of FY 89. It is part of the larger Khon Kaen University Research Development Project (AID Project No. 493-0332) but with substantially separate direction, since it builds on earlier, well-established research activity in cropping systems and farming systems work at KKU which was funded by the Ford Foundation. The project is organized in three major sections of crop scientists, animal scientists and social scientists. Each section conducts interdisciplinary as well as "component" research, and all sections cooperate in joint research activities as well. Direction of all research is coordinated by a "core group" of key researchers. Principal research methods and concepts include farming systems method (FSR, FSR/E), agroecosystems analysis (AEA), human ecology (HE) systems frameworks, as well as a number of facilitating methodologies, such as rapid rural appraisal (RRA). All research focuses on the resource problems and opportunities of farming in rainfed (non-irrigated) areas of Northeast Thailand, where the majority of Thailand's most impoverished people live.

Since KKU is an educational and research institution with no direct responsibility for area development, the FSR Project aims at action agencies as its immediate clients. In order to benefit the rural populations in rainfed areas of Northeast Thailand, the intended beneficiaries, the project works to generate outputs which can be

passed on to farmers through action agencies which implement their programs in the region. Four kinds of such outputs are involved. technology, methodology, information, and training/communication. These outputs are cooperatively generated with the involvement of action agencies themselves (two-way process) and all research is also conducted in such a way as to improve the research capability of Khon Kaen University staff. Another important aspect is that research results are taught in KKU undergraduate and graduate programs. The long term effect of this latter is extremely important, since most KKU graduates go on to work in the Northeast, many of them in the same development action agencies with which the project closely cooperates. It is important to recognize that the short-term "product" objectives of the project are not the same as the longer term "institution building" objectives and, indeed, compromises are often needed to achieve the best mix of these objectives so that each receives adequate effort and attention.

Thus far the Project Research Committee has approved a total of 11 FSR sub-activities in FY 84 and 22 FSR sub-activities in FY 85. The first year's activities were directed at site description of project village, testing of technology and studies of existing farming system. Within the second year of the project research activities were focused more heavily on technology generation and testing. The studies of well-established existing farming system will be a major activity in the second year (FY 85), many of these systems will require in-depth review and analysis. The research activities are being carried out by various staff from the Crop, Animal, Social Science Sections. Some interdisciplinary research is being carried out by the same sections noted above. Most of the research conducted in FY 84 has been completed and final reports on this research are being prepared.

Further background on the FSR Project can be found in the AID Project Paper, the annual FSR Project Research and Financial Plans, the FSR Project Evaluation Plan (September 1984), and various other project documentation available at the project office.

IV. Statement of Work

In order to attain project objectives, the FSR project conducts research activities guided by certain concepts, methodologies and procedures which have been developed and approved by the FSR Advisory Committee. The evaluation, however, can be thought of as covering three levels of concern with having the objectively verifiable indicators that the on-going University Research Program is directed toward rural development needs of Northeast villagers and the rural communities using research findings.

(1) At the "product" level the concern is to assess the adequacy and quality of the research findings themselves, in terms of how the underlying (systems) concepts which the project uses, the methodologies, the organization, etc. affect these products. In particular, the project leadership is interested in outside opinions

on how the various systems frameworks are conceptualized and applied and what can be done to strengthen them. One of these is agroecosystems analysis (especially the four agroecosystem properties of productivity, stability, sustainability and equitability - whether any of these should be changed elaborated, the ways in which they can be "measured," their adequacy in problem/opportunity identification, and their ability to guide research). Another issue has to do with the "real-world" validity of the steps in FSR/E approach, on whether it is valid for a university research program to work on them all "at the same time", on alternative models for conceptualizing process in FSR, etc. Another issue has to do with the role of farmer-to-farmer methodologies in FSR and how these relate to university staff researcher technological expertise and FSR process. Another is the role of the human ecology systems perspective in the definition and conceptualization of the "farming system" itself (i.e., the specific inclusion of sociocultural and socioeconomic factors and whatever hierarchical levels are necessary to understand relevant aspects of systems behavior).

(2) At the organizational and methodological levels, the concern is with the operations of FSR research within the project. The particular concern here is with the methods used to achieve interdisciplinary action and the methods used to guide research priorities and get research results widely applied in action agencies. The project has had some success in this regard through the widespread use of rapid rural appraisal (RRA) methodologies, especially in training in problem identification, in integrating multidisciplinary teams, in learning local conditions, etc., but the interest here is to try to get a similar degree of inter-disciplinary closure in all relevant phases or aspects of FSR process. Recommendations in this realm will be very useful to project personnel.

(3) At the institutional level, the concern is with the manner and degree to which the FSR project is contributing to building and sustaining research capabilities within Khon Kaen University and affecting the building and sustaining of successful problem-solving approaches within KKU but also within the "larger environment," to include the cooperating action agencies with whom the project works (see Twatchai Yongkittikul). First Phase Mid-Term Evaluation of Khon Kaen University Research Development Project, March 1985, pp. 35-37). Effects on KKU undergraduate and graduate students should also be considered at this level of concern, as well as their subsequent employment after their studies are completed.

(4) On each of the points above, the evaluation team will develop: Findings (the facts of the matter), Conclusions (underlying reasons for problems) and Recommendations.

V. Methods and Procedure

(1) For purposes of this evaluation, a Personal Services Contract (PSC) has to be signed between DTEC and each of the four team members.

(2) The team leader has to work for 24 working days (6 days a week) with remunerations, plus being entitled to per diem for a period of 30 days.

(3) The team members has to work for 18 working days (6 days a week) with remunerations, plus being entitled to per diem for a period of 21 days.

VI. Composition of Evaluation Team

(1) Team Composition

It is proposed that a four-member team be formed to handle this evaluation, consisting of a team leader (a U.S. citizen) and three members (one U.S. citizen and two Thais). The team members will work under the supervision/assignment of the team leader.

(2) Selection of Team

2.1 Team Leader who should have a Ph.D. in Ecological Anthropology with having a wide Human Ecology research experience in S.E. Asia. He/She should have a familiarity/expertise in concepts of human ecology, agroecosystems analysis, human-environmental relationship, and farming system. He/She should have some work experience in N.E. Thailand.

The team leader will be responsible for writing the final report in time as stated in the schedule. He will coordinate the work assigned to the team members to be in line of the evaluation scope of work. He is responsible for presenting the findings to USAID and the implementing agencies.

2.2 Team Member (a U.S. Citizen)

This person should have a Ph.D. in Agricultural Economics and having a research experience in the N.E. Thailand. He/She should be familiar with farming systems concepts. Preferable is a person who can speak Thai.

2.3 Team Member (Thai)

This person should have a Ph.D. in Agricultural Economics and having a research experience in the N.E. Thailand. He/She should be familiar with agroecosystems analysis and farming systems concepts.

2.4 Team Member (Thai)

This person should have a Ph.D. in Animal Science with a background on farming systems research. He/She should have experience/expertise on the role of livestock in farming systems, especially in N.E. Thailand.

VII. Reporting Requirements

After the final composition of the evaluation team shall have been set-up, the following are the suggested working arrangements.

The evaluation team will need a total of about 4 weeks in Thailand in order to complete their work. The team leader should spend the full 4 weeks which the last week should be used for writing up the final report. The other team member will spend only 3 weeks. Primary sites for the work will be in Khon Kaen University, villages in Khon Kaen Province, various government offices in and near Khon Kaen, plus a few days with government offices in Bangkok.

Before leaving Khon Kaen, the evaluation team should present a preliminary oral report to the project personnel. A completed written draft report, with executive summary, should be submitted to USAID/Bangkok (with a copy to the project in Khon Kaen) at the end of the four week period at least three working days before the expatriate team members leave the country.

The tentative schedule for the evaluation team to start the work will be in mid January 1986 following the workshop on agroecosystem in S.E. Asia which will be held at KKU during January 6-10, 1986.

APPENDIX B: SOURCES OF INFORMATION

Within Khon Kaen University

* Farming Systems Project: Director, Section Leaders and Deputy Leaders, participating scientists and field researchers and research assistants in all sections.

* Written documentation produced by FSR Project staff including progress reports, RRA reports, conference papers, and Farming Systems News.

* Staff in the Departments, e.g., Animal Science, Agricultural Economics, Agricultural Extension, who are not participating in the FSR Project.

* The Director of the Research and Development Institute.

* Graduate students in Agronomy and Animal Science.

* The Ford III Consultants.

* The Fulbright Consultant.

Outside of Khon Kaen University

* Senior staff and advisors of NERAD.

* Staff of the Department of Agricultural Extension, including Kaset Changwat, Kaset Amphoe, Kaset Tambon and the Subject Matter Specialists in Khon Kaen Province, and senior staff of the DOAE Planning Division.

* Staff of the Farming Systems Research Institute, Khon Kaen Rice Station.