AID 1020-5 (10-73)

PAGE 1

# PROJECT APPRAISAL REPORT (PAR)

9310536 (3)

| 1. PROJECT NO. | 2. PAR FOR PERIOD | 3. COUNTRY | 4. PAR SERIAL NO. |
|---|---|---|---|
| 2975 | July 1, 1974 TO Dec. 3, 1975 | Korea and Worldwide | PD-AAF-400-C1-7p |

5. PROJECT TITLE: Adapting and Testing of Agricultural Simulation Models to Sector Analysis

931-17-140-536

| 6. PROJECT DURATION | 7. DATE LATEST PROP | 8. DATE LATEST PIP | 9. DATE PRIOR PAR |
|---|---|---|---|
| Began FY 72 Ends FY 76 | August 1974 | | August 1974 |

| 10. U.S. FUNDING | a. Cumulative Obligation Thru Prior FY: $ | b. Current FY Estimated Budget: $ | c. Estimated Budget to completion After Current FY: $ |
|---|---|---|---|
| | 1,143,968 | 391,880 | 0 |

11. KEY ACTION AGENTS (Contractor, Participating Agency or Voluntary Agency)

| a. NAME | b. CONTRACT, PASA OR VOL. AG. NO. |
|---|---|
| Michigan State University | AID/csd-2975 |
| | |
| | |

I. NEW ACTIONS PROPOSED AND REQUESTED AS A RESULT OF THIS EVALUATION

| A. ACTION (X) USAID | AID/W | MSU | B. LIST OF ACTIONS | C. PROPOSED ACTION COMPLETION DATE |
|---|---|---|---|---|
| | | X | Formal documentation of work in Korea | 30 June 1976 |
| X | X | X | Utilization review in Korea | March 1976 |
| | x | | Utilization of Simulation Approach in Other LDCs | FY 1977 |
| | X | | Demand for training services | March-June 1976 |
| X | X | X | Extension of Systems Sciential appointment | January 1976 |



D. REPLANNING REVIEWS

REVISED OR NEW: ☐ PROP ☐ PIP ☐ PRO AG ☐ PIO/T ☐ PIO/C ☐ PIO/P

E. DATE OF MISSION REVIEW

| PROJECT MANAGER: TYPED NAME, SIGNED INITIALS AND DATE | MISSION DIRECTOR: TYPED NAME, SIGNED INITIALS AND DATE |
|---|---|
| L.B. Fletcher LBF 1-2-76 | L.F. Hesser 1/9/76 |

## NARRATIVE

A review of the Agricultural Simulation Models project was held at Michigan State University on December 4, 1975. The AID review team consisted of L.B. Fletcher, W.C. Merrill, and John Foti (ASIA/RD). The review covered the following phases of the project:

Software library
Training program
Project documentation
Extension of Systems Sciential Assignment in Korea
Utilization review

MSU has not progressed to the point of developing on operational software library that can be institutionalized in an international agency. By the end of the contract period, a simulation language will be in use and documentation of the most useful components from the Nigeria and Korea models will be completed. Interest in transferring components to other agencies (including AID) is being pursued at this time, it does not seem likely that a fully operational library transferred to another institution can be achieved by the end of the contract period.

The training program is operating this year with seven students. A number between 10-15 is considred optimal. MSU has not been able to arrange continued financial support for the program after the end of the contract. ESD will circularize Missions to determine interest in utilizing the training program on a wider basis.

Plans for a systematic and comprehensive documentation of the Korea experience were discussed. A work plan was agreed upon and is attached to this PAR.

The need for an extension of the assignment of a system scientist in Korea for 18 months past the end of the contract has been agreed to by TAB, USAID/Korea, the Korean Government, NSA and the Asia Bureau. Plans to fund Michael Abkin for this period are under way and should be completed in January 1976.

A joint utilization review in Korea between TAB and Asia Bureau is planned for March 1976. Plans for this review were discussed with the MSU project staff.

Continued utilization of the MSU capacity is expected to take place under the Cooperative Agreement program and under Title XII. These possibilities discussed with MSU staff and administration.

Rossmiller
Carroll
Manetsch
Johnson
16 December 1975

# WORK PLAN FOR DOCUMENTATION OF WORK CARRIED OUT BY THE AGRICULTURAL SECTOR ANALYSIS AND SIMULATION PROJECTS, 1971-1976

Formal documentation of project activities has taken place throughout the course of the project via the KASS Report, special reports, papers and articles. Informal documentation has also taken place through working papers, special project papers, memos and administrative reports.

Activities have progressed on a broad front with continuous developmental work creating a moving target situation unsuited for comprehensive formal documentation. Thus, developmental and operational activities at present have far outstripped documentation of these activities.

During the last six months of the project under Contract AID/csd-2975, intensive effort will be directed toward comprehensive documentation. The KASS model for these documentation purposes will be frozen by 31 December 1975. Between 1 January and 31 March 1976 documentation will take place in Korea primarily to leave behind for Korean use. A memo detailing the format to be used for these efforts from Mike Abkin to the KASS team is presently being implemented.

In addition, documentation is necessary for the wider audience outside of Korea. This will take place in East Lansing leading up to intensive efforts by past and present project personnel during May and June 1976. It will, to the extent possible, take advantage of the documentation done prior to 31 March 1976 in Korea as well as in East Lansing. Documentation will include:

1. A report on the Policy Analysis Language package. Five sections will be included as follows:

a) verbal description of what it is, what it does, how it works

b) user's manual

c) using PAL from the terminal

d) reference manual

e) program description

RESPONSIBLE TEAM MEMBERS: Winer, Wolf, Carroll

2. Software library of utility routines. Documentation in conformance with the CLASS program and documentation standards manual.

RESPONSIBLE TEAM MEMBERS: Winer, Wolf, Carroll, Abkin

3. Report on CLASS structure and CLASS documentation standards. This report will include the conceptual base for the library, institutional requirements for its operation, and the CLASS documentation standards.

RESPONSIBLE TEAM MEMBERS: Abkin, Winer, Carroll

4. Technical documentation of the KASS model. This general documentation should require little modification of the documentation done in Korea by the KASS team. The focus will be on the technical and program description of the models.

RESPONSIBLE TEAM MEMBERS: Abkin, Carroll, Manetsch, Gibson, Thodey, Teigen, Ingvaldson

5. And end-of-project administrative report to AID. It is contemplated that this report be rather brief, referring liberally to other documents produced by the project and mainly accounting administrative matters such as personnel, budget and project activities.

RESPONSIBLE TEAM MEMBERS: Rossmiller

6. The major report will be a generalized, comprehensive report of project activities over the five-year contract. Its focus will be on what we can say at this point about building analytical capacity for agricultural sector development. It will use Korea and Nigeria as case examples where appropriate.

The audience is presumed to be:

a) students of agricultural development from a variety of discipline and experience backgrounds,

b) government staff analysis concerned with agricultural sector development,

c) international research center staffs,

d) development practitioners in international (both multi- and bilateral) agencies, and

e) to a limited extent, decision makers themselves.

The report, as presently envisioned, will include five parts with varying numbers of chapters in each part. Following is a part and chapter outline to present a quick overview of the topics and their sequence. At the end of this outline is a section in which the parts and chapters are more finely detailed.

# A SYSTEMS APPROACH TO PLANNING AGRICULTURAL SECTOR DEVELOPMENT: WITH EMPHASIS ON BUILDING AN ANALYTICAL CAPACITY

PART IV--AN AGRICULTURAL SUBSECTOR MODEL: THE GRAIN MANAGEMENT PROGRAM MODEL

*Chapter 1*--Rationale for Subsector Models

*Chapter 2*--The Korean Grain Management Program Example

*Chapter 3*--Component Integration and Utilization

PART V--FUTURE DIRECTIONS FOR AGRICULTURAL SECTOR DEVELOPMENT PLANNING

*Chapter 1*--The Software Library--CLASS

*Chapter 2*--International Assistance and Indigenous Prerequisites

*Chapter 3*--Conclusions, Recommendations and Future Directions

Following is a more detailed overview of the contents of each part and chapter. Approximate page length indicated is double-spaced, typewritten. Printed copy will be approximately 1 page per 2.5 typewritten. Assignments are subject to modification and much interaction, review, and critique is contemplated. Also indicated are tentative work assignments.

PART I--AGRICULTURAL SECTOR DEVELOPMENT PLANNING PROBLEM DIMENSIONS

*Chapter 1*--Agriculture in the National Economy (20-25 pgs.)

This chapter should lay out in the introductory section the general environmental setting for the agricultural sector in most LDCs, its importance as part of the total development process, and make the point that it competes for attention, resources and budget with other sectors of the economy. Drawing upon parts of Chapter 2 in the Korean Sector report, but generalizing the topics, the normal kinds of demands placed on the agricultural sector in most LDCs should be detailed. Included should be such topics as: (1) agricultural production for an expanding population with increasing incomes; (2) resource transfers from agriculture to the nonagricultural sectors including land, labor and capital; (3) the agricultural sector as a consumer of goods and services produced in the nonagricultural sectors of the economy; and (4) agriculture as a factor in the balance of payments position of an economy.

RESPONSIBLE TEAM MEMBERS: Rossmiller, Johnson

*Chapter 2*--Agricultural Planning and Policy Choices (20-25 pgs.)

This chapter should indicate the many decision choices which must be made in order to make agriculture a viabl , dynamic force in national development, including both public and private decisions. Such decisions need to be categorized in short versus long-term decisions concerned with both policy

environment and investment. Conceptualization of the process and some of the problems in linking the planning, policy formulation, program development, project design and execution activities from the national to the local levels should be detailed with the caveat that our primary focus is at the national level concerned with the agricultural sector and subsectors. Further, our focus is on that part of the decision process dealing with analytical capacity.

RESPONSIBLE TEAM MEMBERS: Rossmiller, Johnson

*Chapter* 3--An Eclectic Approach (30-40 pgs.)

This chapter should draw heavily on relevant portions of the Nigerian report and Chapters 4 and 5 of the Korean report. It should have sections dealing with:

a) the framework for the decision process

b) a discussion of models for decision making from mental to computer in order to set those readers with a fear of models at ease

c) a discussion of the basis for the development of credibility gaps between analysts, model builders, and decision makers

d) special versus general approaches with respect to techniques, information and philosophies

e) the operating definitions used by the team with respect to systems simulation, and

f) the policy environment and decision maker interaction.

The philosophic underpinning and theoretical base for linkage between the research and development component of the project and the field activity should be drawn. Here we need to draw upon some of the broader thinking which has been done by various team members on the relationships between disciplines and problems, disciplinary research, subject matter inquiry, and problem-solving analytics. The relationship between problem-solving analytical work with

its identification of methodological and theoretical limitations and the disciplinary work to push forward the theoretical and methodological frontiers and the feedback to the field activity should be spelled out.

RESPONSIBLE TEAM MEMBERS: Johnson, Rossmiller

## PART II--TOWARD IMPROVING THE ANALYTICAL CAPACITY

### *Chapter 1*--Required and Available Resources (20-25 pgs.)

This chapter should detail the resources required for developing an analytical capacity to provide input to planning and policy formulation decision making at the national level. Such resources include capable administrative and organizational skills by those in government, statistics, data and information systems in the broadest sense, trained personnel, hardware and software systems, and so forth. Next should be a discussion of the difficulties encountered by LDCs in attempting to develop and integrate such resources on their own to improve the analytical capacity. This should be done through a discussion relating the resources required to the usual limited set of resources found in LDCs. One of the major limiting resources is organizational skills. Another is the stock of human capital. This can lead then to the point that outside assistance is often necessary to develop or at least speed up the process of developing an analytical capacity.

RESPONSIBLE TEAM MEMBERS: Rossmiller, Johnson, Jones, D. H. Kim

### *Chapter 2*--The Host Country Perspective (20-25 pgs.)

Drawing on the more generalized statement in Chapter 1 of this part, this chapter should deal with the host country perspective in terms of the Korean case. It should be somewhat historical with respect to planning

and policy formulation in agricultural sector development in Korea going back at least as far as the establishment of the Agricultural Economics Research Institute in the Office of Rural Development in 1967. It should detail the kinds of multiple problems with which decision makers must deal. It should lead up to the point of discussing the multiple objectives found within the Korean Government as they turned to outside sources of assistance, in this case, AID to help develop the analytical capacity.

RESPONSIBLE TEAM MEMBERS: D. H. Kim, D. M. Kim

*Chapter 3*--The Assistance Agency Role (20-25 pgs.)

This chapter should include briefly the philosophic base, the rationale and the role of donor and grantor agency involvement in providing technical assistance for improving analytical capacities in host countries. It should indicate the general sets of objectives such agencies have in providing this assistance and then turn to the specific case of developing the background leading to the project in Korea. Both in this and the preceding chapter, the point should be made that neither a government nor an assistance agency is a monolith and that internal objectives may be complementary, competing or even conflicting.

RESPONSIBLE TEAM MEMBERS: Jones

*Chapter 4*--The Theory and Practice of Model Building (30-40 pgs.)

A somewhat more technical description of the systems methodology and simulation techniques. Principles, guidelines, and conventions used in conceptualizing and building large scale general systems simulation type models.

RESPONSIBLE TEAM MEMBERS: Manetsch, Carroll, Abkin

*Chapter* 5--Training to Build Capacity (15-20 pgs.)

An important ingredient in this project has been the development of a training program to complement the field activity and to provide focused training to build indigenous capacity during the life of the project. In addition, other participant training and observation team activities took place with linkages to the project and the longer run needs of the indigenous team. This chapter should include discussions on the importance of the training component linked to the broader project. Specific detail on the training level and speciality requirements for an indigenous team to provide required levels of analytical capacity detail on the specific training program provided through the project and discussion of how it should develop and what it should become.

RESPONSIBLE TEAM MEMBER: Manetsch

*Chapter* 6--Development of a Project: Korea (25-30 pgs.)

This chapter should focus on Korea and the development of the specific project there spelling out the specific sets of complementary, competing and conflicting objectives of the Korean Government, AID, and MSU. The components of the MSU project related to the functions required for developing an analytical capacity in Korea and generalizing it in other locations should be detailed. These components will include not only the field activity in Korea, but also the software library, the training programs, and the disciplinary research and development activities. The broad perspective and eclectic approach to the design of the project itself should be stressed.

RESPONSIBLE TEAM MEMBERS: Johnson, Jones, Rossmiller, D. H. Kim

## PART III--AN AGRICULTURAL SECTOR MODEL

*Chapter 1*--Agricultural Sector Model Conceptualization: The Korean Example (20-25 pgs.)

This chapter should introduce the concept of a general agricultural sector model at an aggregated level with the major components linked in a block diagram. The point should be made that many of the physical processes to be modeled in an agricultural sector are not unique to any one location and are geographically transferable. The point also should be made that whatever type and scope of model evolves, it will never be able to provide all of the analytical input required for any specific decision or solution to any specific problem but that in many cases it can come close, provided the capability of modifying the models and adapting them to specific needs is built into this system. This introductory chapter of Part III should set the stage for detailed description of each of the components in the KASS models as a case example of a general agricultural sector simulation model.

RESPONSIBLE TEAM MEMBERS: Manetsch, Abkin, Carroll, Johnson

*Chapter 2*--The Population Component (15-20 pgs.)

This chapter should include a description of the process involved, the theoretical base, techniques used, data requirements, parameter estimates required and outputs provided. Work by Kim, S. Y.; Park, K. S.; and Sloboda should be indicated as part of the R&D function as appropriate.

RESPONSIBLE TEAM MEMBER: Carroll

*Chapter 3*--The National Economy Component (15-20 pgs.)

This chapter should include a description of the process involved, the theoretical base, techniques used, data requirements, parameter estimates required and outputs provided.

RESPONSIBLE TEAM MEMBER: Abkin

*Chapter 4*--The Demand Component (15-20 pgs.)

This chapter should include a description of the process involved, the theoretical base, techniques used, data requirements, parameter estimates required and outputs provided.

RESPONSIBLE TEAM MEMBERS: Abkin, Teigen, Thodey

*Chapter 5*--The Foreign Trade Component (15-20 pgs.)

This chapter should include a description of the process involved, the theoretical base, techniques used, data requirements, parameter estimates required and outputs provided.

RESPONSIBLE TEAM MEMBERS: Abkin, Teigen, Thodey

*Chapter 6*--The Resource Allocation and Production Component (15-20 pgs.)

This chapter should include a description of the process involved, the theoretical base, techniques used, data requirements, parameter estimates required and outputs provided.

RESPONSIBLE TEAM MEMBERS: deHaen, Bauersachs

*Chapter 7*--The Yield Determination Component (15-20 pgs.)

This chapter should include a description of the process involved, the theoretical base, techniques used, data requirements, parameter estimates required and outputs provided.

RESPONSIBLE TEAM MEMBERS: J. H. Lee

*Chapter 8*--Component Integration and Utilization (35-40 pgs.)

This chapter should draw upon the first seven and put the system together as it operates in the KASS model. A base run output should be displayed along with discussion of how the model has been used particularly in working on the Fourth Five-Year Development Plan and as input to the land and water development perspective plan for the Agricultural Development Corporation. Other uses of the model should also be detailed.

RESPONSIBLE TEAM MEMBERS: Abkin, deHaen, Carroll, Duvick, Mangum, Rossmiller

PART IV--AN AGRICULTURAL SUBSECTOR MODEL: THE GRAIN MANAGEMENT PROGRAM MODEL FOR KOREA

*Chapter 1*--Rationale for Subsector Models (15-20 pgs.)

This chapter should begin with the thinking process by which the KASS team arrived at the conclusion that subsector modeling was necessary along with the broad umbrella sector model. It should also indicate why we decided to do a model of the grain subsector detailing the specific problems to be addressed, the requirements for a model, and the overall model conception, and relationships to the KASS model.

RESPONSIBLE TEAM MEMBERS: Manetsch, Gibson

*Chapter 2*--The Korean Grain Management Program Example (30-35 pgs.)

This chapter should include a description of GMP subsector model, the process involved, the theoretical base, techniques used, data requirements, parameter estimates required and outputs provided.

RESPONSIBLE TEAM MEMBERS: Gibson

*Chapter 3*--Component Integration and Utilization (20-25 pgs.)

This chapter should indicate how the subsector components operate together to provide a management tool for the Farm Bureau in MAF in managing grains price policy. Specific applications of the parts of the model to grains price policy decisions.

RESPONSIBLE TEAM MEMBERS: Gibson, Mangum, Abkin

PART V--FUTURE DIRECTIONS FOR AGRICULTURAL SECTOR DEVELOPMENT PLANNING

*Chapter 1*--The Software Library--CLASS (20-25 pgs.)

This chapter should develop the rationale for a software library; indicate the team concept of models being composed of three parts, structure, parameter estimates, and data; outline CLASS documentation standards; and indicate the organizational structure required for institutionalizing and operating such a library.

RESPONSIBLE TEAM MEMBERS: Abkin, Winer, Carroll

*Chapter 2*--International Assistance and Indigenous Prerequisites (20-25 pgs.)

This chapter should draw upon the team's experience in Korea to address such questions as: What is the role of international assistance and

specifically the university in helping develop an analytical capacity in a host country? What can the external agencies do and what can they not do? Is our approach transferable to other locations and if so, what are the prerequisites with respect to level of economic development, level of indigenous personnel, training and background, interest on the part of government decision makers, etc?

RESPONSIBLE TEAM MEMBERS: Johnson, Jones, Abkin, Rossmiller, Mangum, Carroll, D. H. Kim

*Chapter* 3--Conclusions, Recommendations and Future Directions (30-35 pgs.)

This chapter should begin with a concise summary of the long and broad track this project has taken over the five years of its existance. It should then draw together the major conclusions developed in other chapters of the manuscript and set out specific recommendations for future development of analytical capacities in host governments in other locations than Korea. A final section might deal with the future of agricultural sector analysis and the broadening and deepening dimensions of such analysis through the use of general, systems-simulation models to include other important components within the rural sector and important dimensions of program development, project design, evaluation moritoring and execution at the local levels based upon the national planning efforts.

RESPONSIBLE TEAM MEMBERS: The total team will contribute--Rossmiller will organize